

In-memory computing with SAP HANA

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Hyperconnectivity across people, business, and devices give rise to a new digital economy powered by real-time data



75 billion connected devices
in the Internet of Things

Over 2.55 billion
social media users by 2020

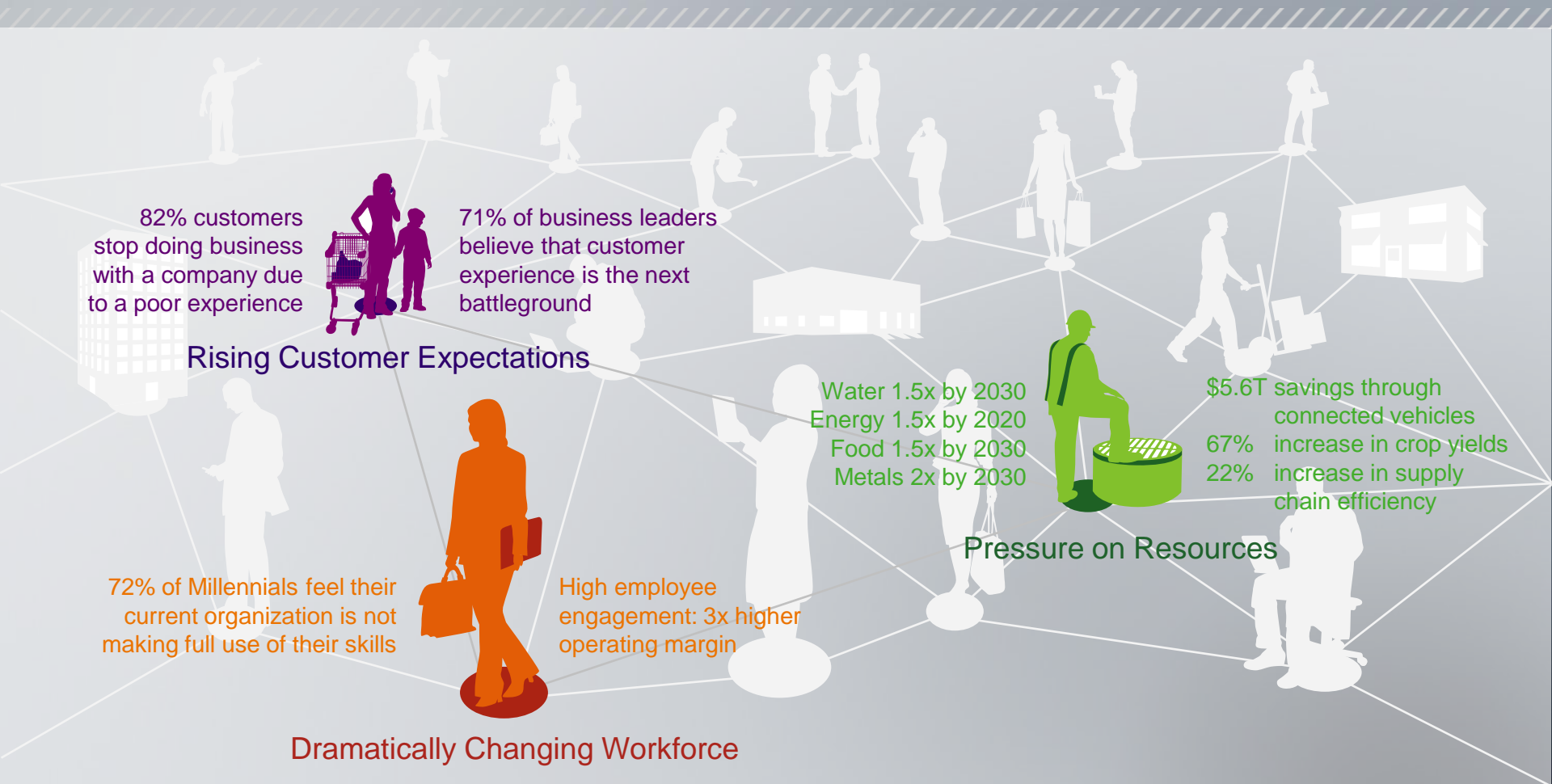
U.S.\$65 trillion in global trade
through connected businesses

Source: [Business Insider](#)

Source: www.emarketer.com

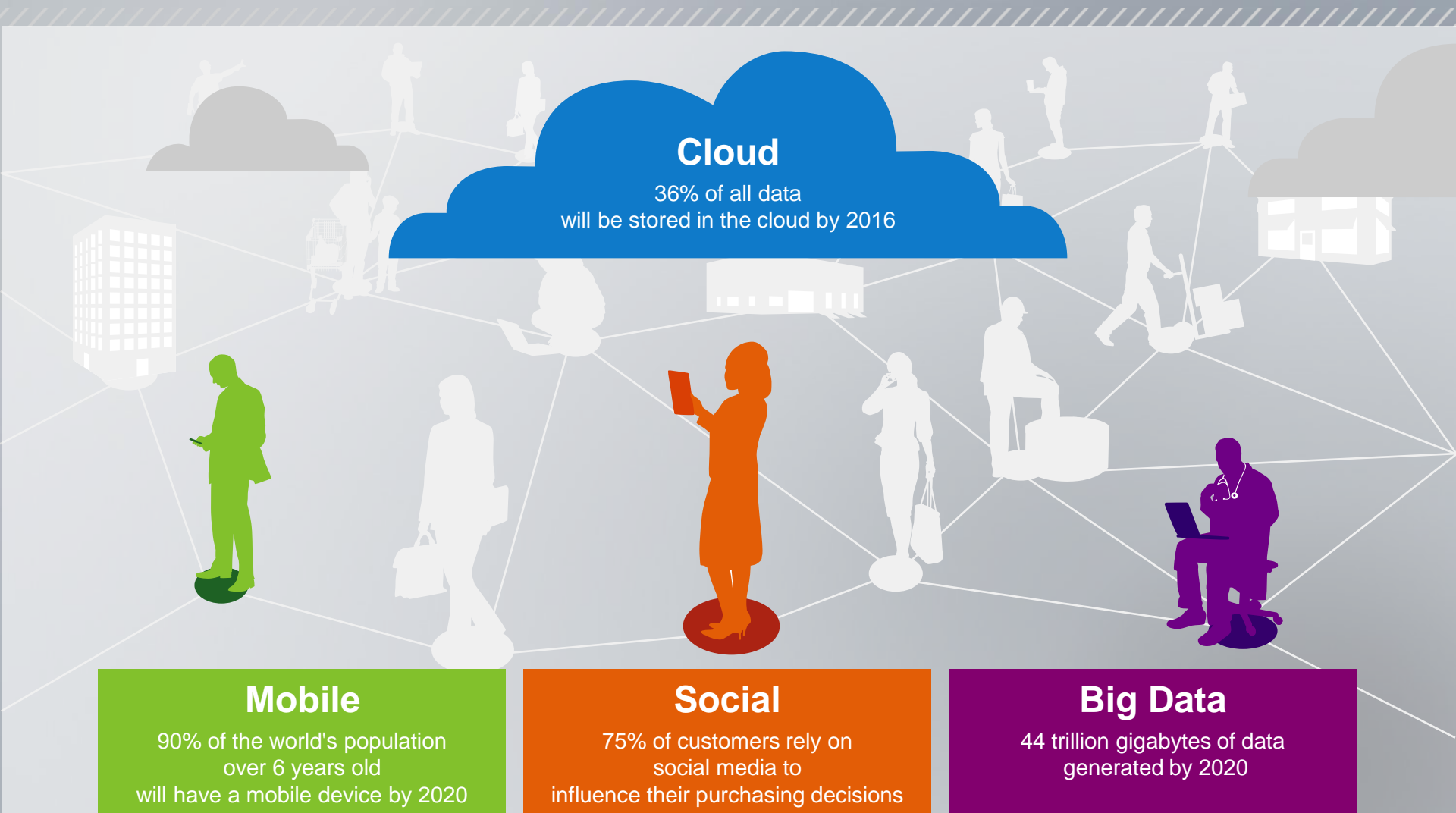
Source: SAP Corporate Fact Sheet 1/2015

As five billion people reach middle class, new challenges arise in customer expectations, workforce, and resource management



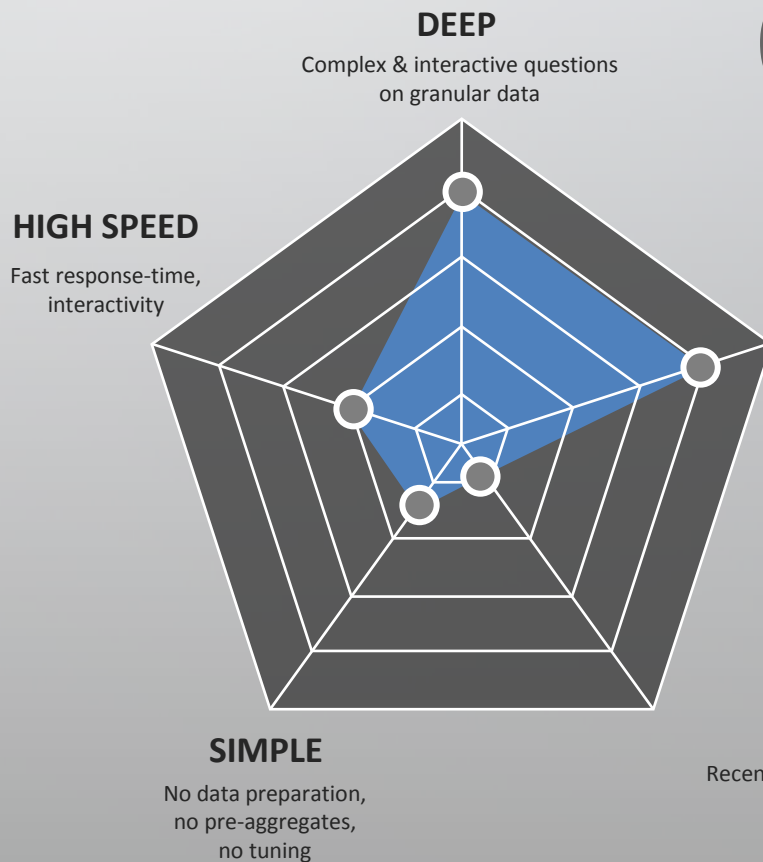
Sources: Impact Report, Harris Interactive. Colin Shaw and John Ivens, 2010; Deloitte Millennial Study, 2015; Shell, 2014; WRI, 2014; SAP SE, 2014. [Towers Watson, 2012](#)

77% of CEOs are creating value in the customer experience with digital technologies

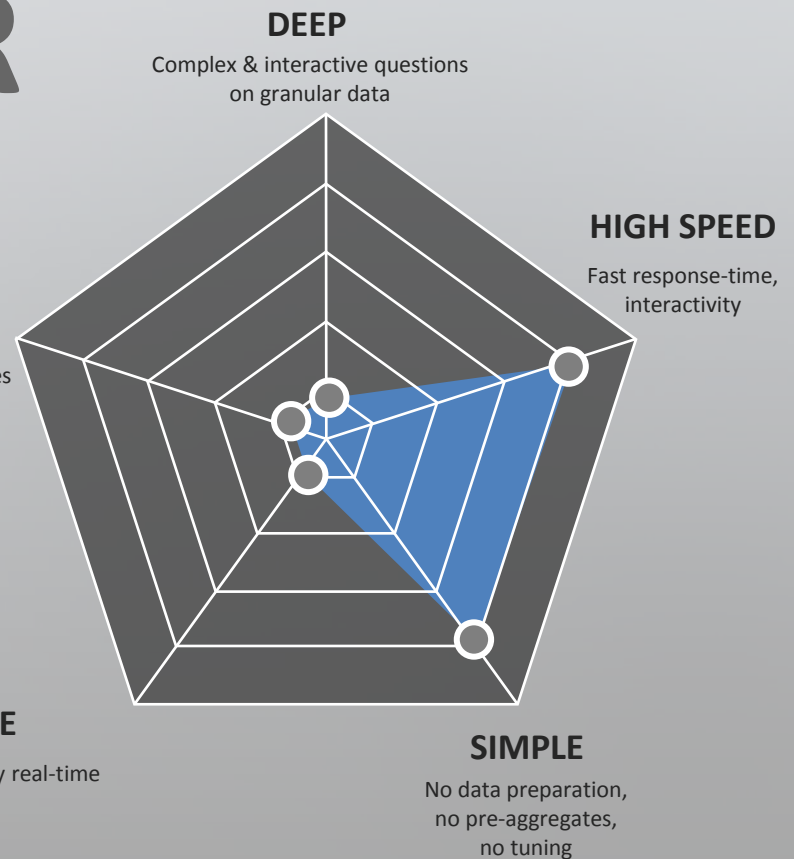


Sources: McKinsey Study, 2013; [CloudTweaks.com](#); [Ericsson, 2014](#); [CIO Insight, 2014](#); [Adweek, 2014](#)

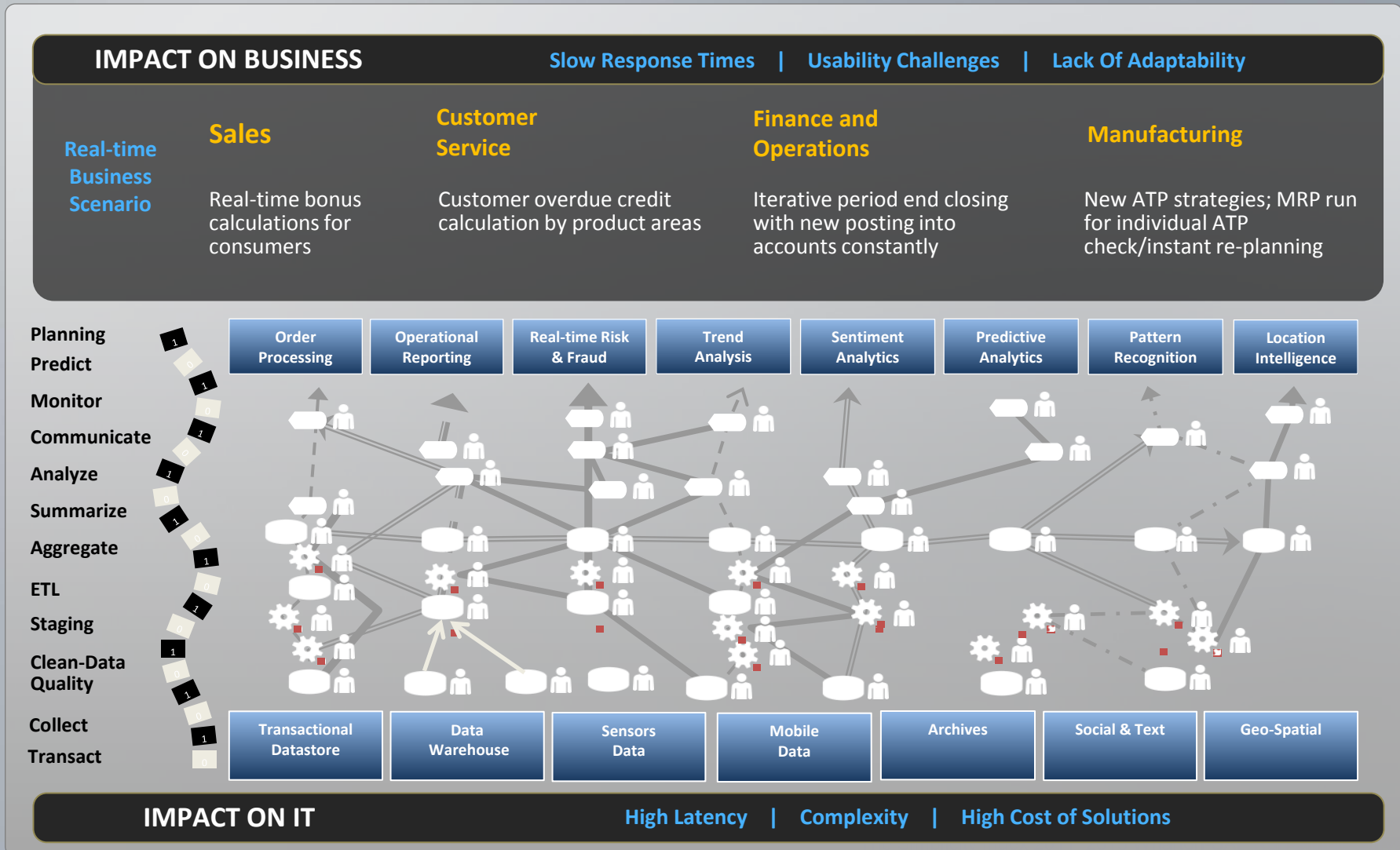
A breakthrough in today's information processing architecture is needed



OR



10.2% or U.S.\$237 billion of profits are lost by the top 200 global companies due to hidden costs of complexity



Next-generation Software & Hardware Architecture

Removing data processing bottlenecks using latest innovations in computing

CPU



Multi-Core Architecture

8 CPU x 10 Cores per blade

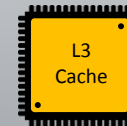
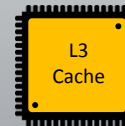
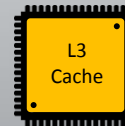
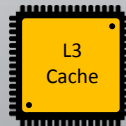
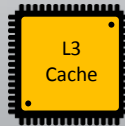
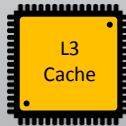
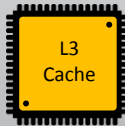
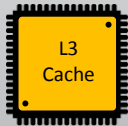
Massive parallel scaling with many blades



64bit address space

1 TB in current servers

Dramatic decline in price/performance



MEMORY



OLTP+OLAP
in column Store



Partitioning



Insert Only on Delta



No Aggregate tables
(Dynamic Aggregation)



Compression

Logging and Backup

STORAGE



Solid State

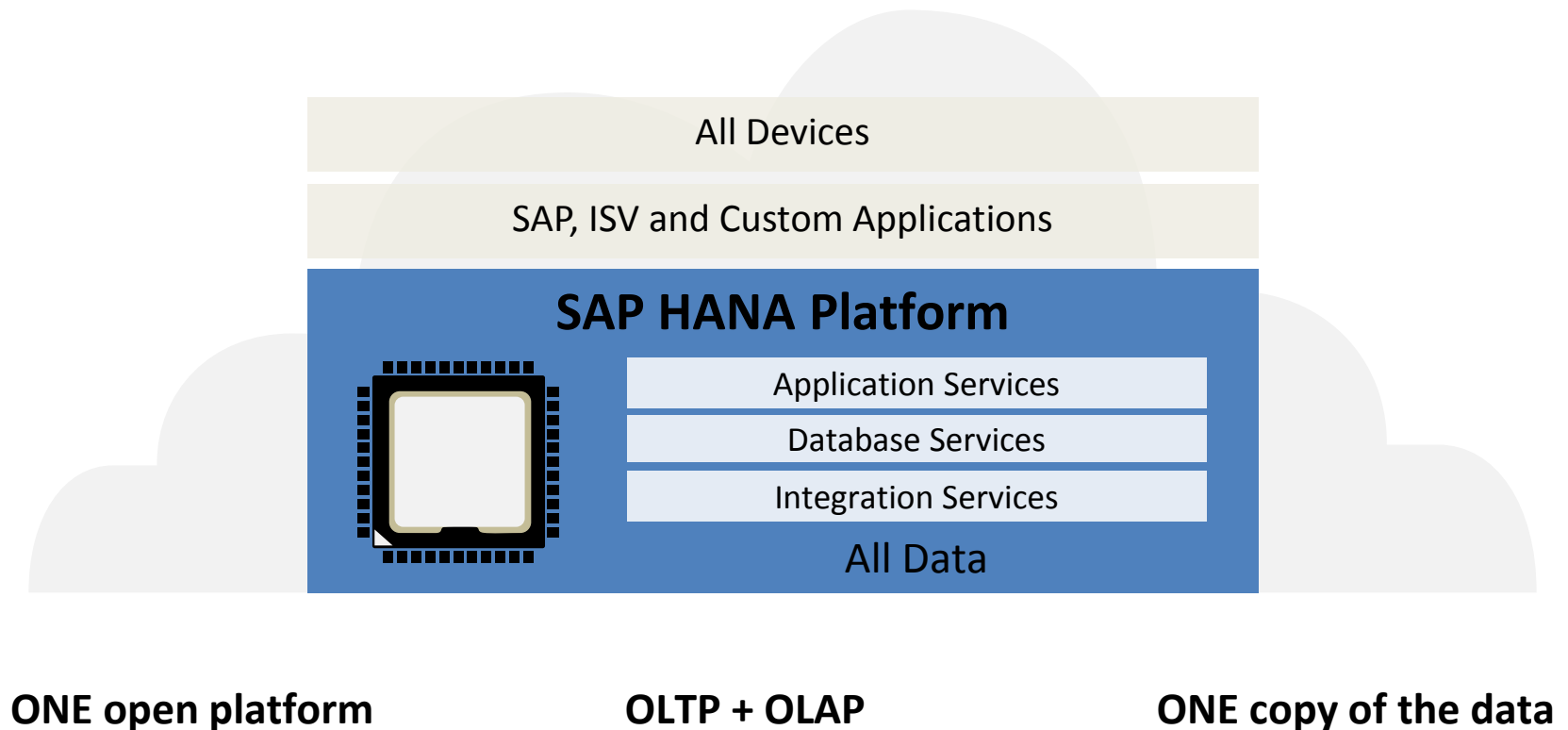


Flash



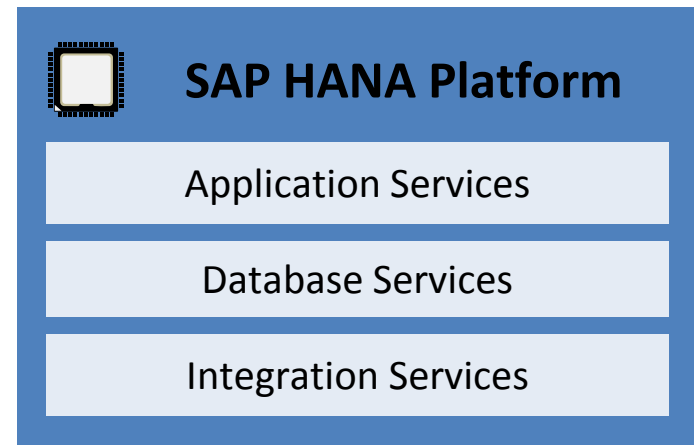
HDD

SAP HANA Platform - The in-memory computing platform for all Applications

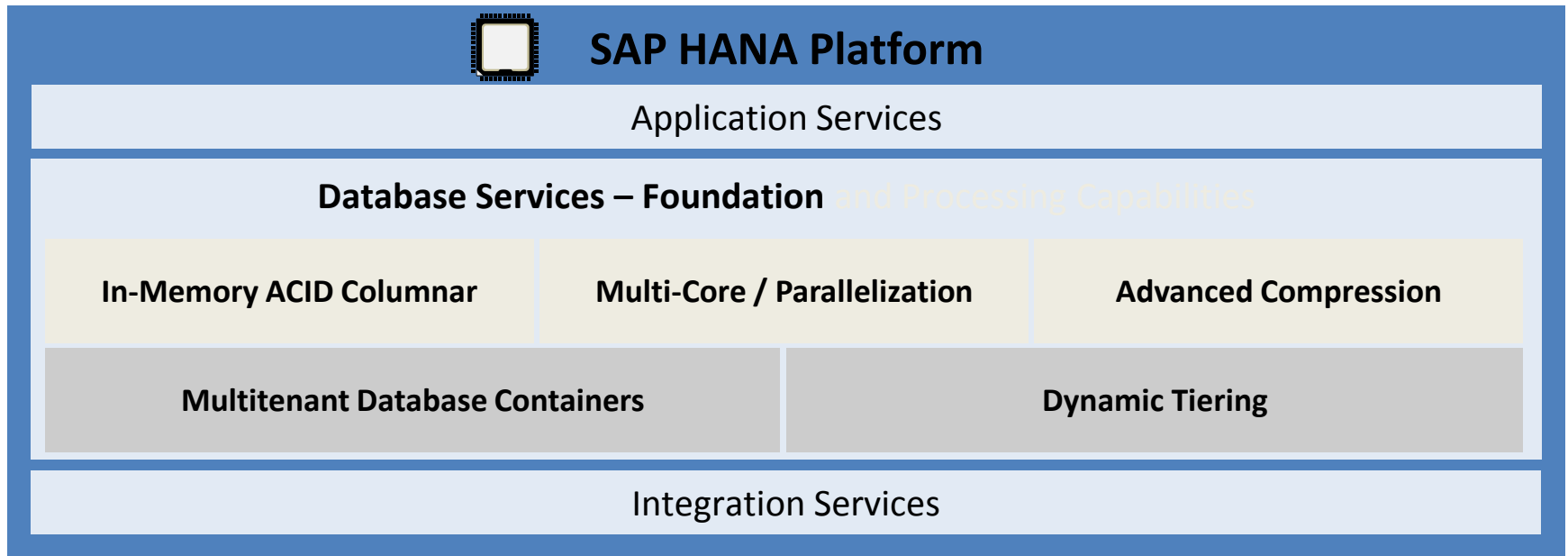


Standard-based and Open

- **Database Services**
 - Standard RDBMS
 - ACID, SQL 92 Compliant
 - Accessible thru JDBC, ODBC, JSON, OData
 - Standard security model
 - Choice of third party administration tools
- **Application Services**
 - Choice of application servers and webservers
 - Eclipse based and web development tool
 - Include web server with Java Script support
 - Include HTML5 UI libraries
- **Integrations Services**
 - Data movement and federation with existing DBs
 - Integration with R and Hadoop

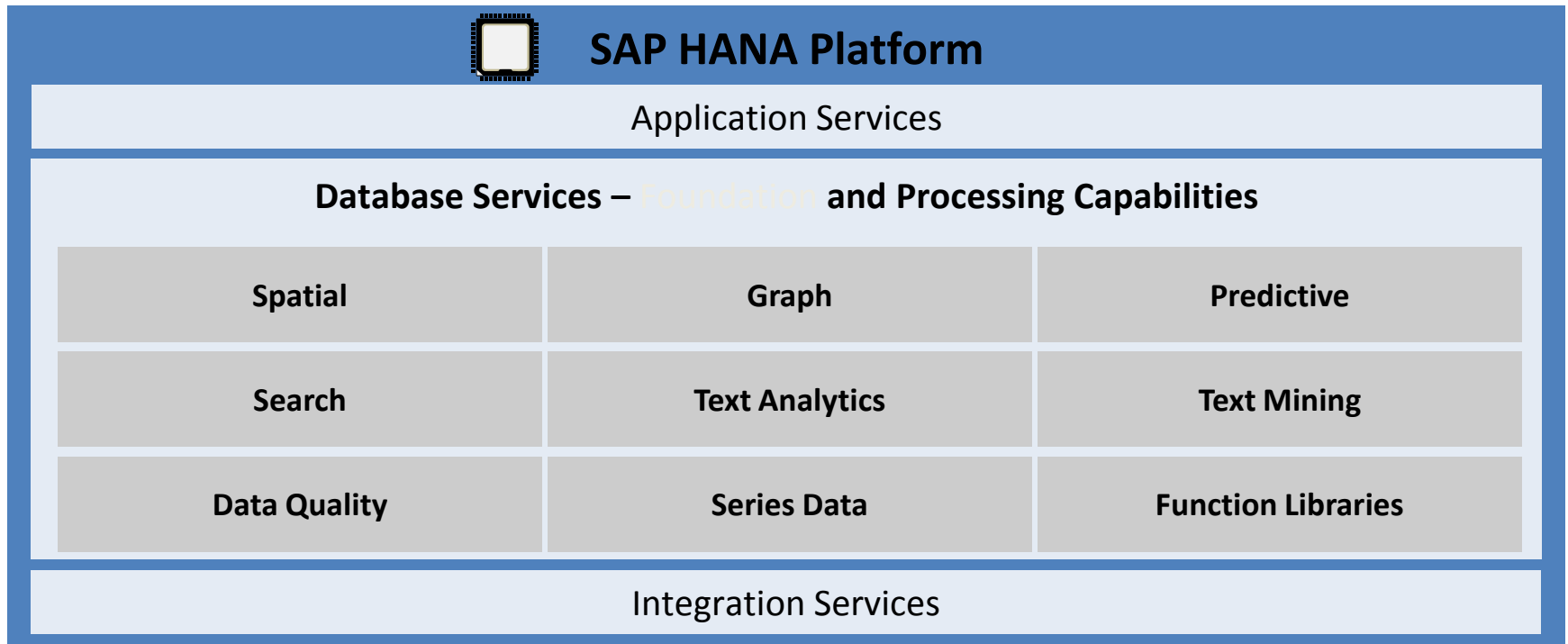


In-memory Database Services



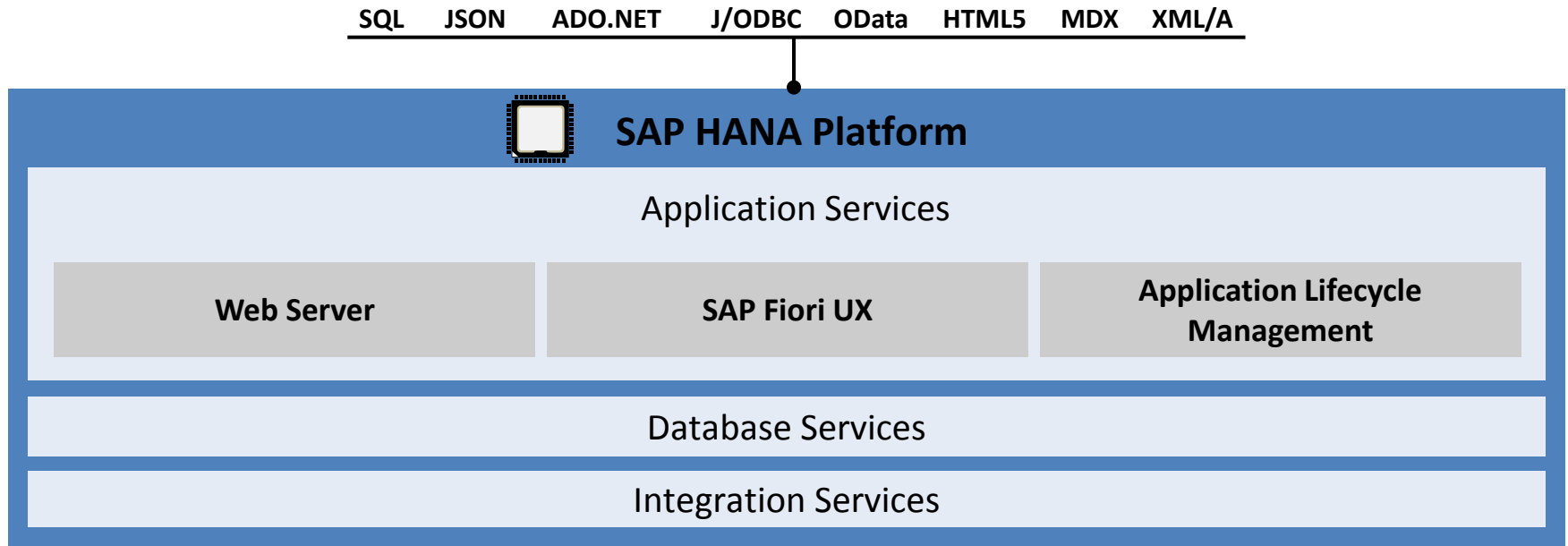
- Turns data into real-time information
- No database tuning required for complex and ad hoc queries
- Run Transactions and Analytics together on one system and one copy of data
- Ready for Cloud, Hybrid, or On-premise deployment
- Not limited by the size of memory

Comprehensive advanced data processing and analytics



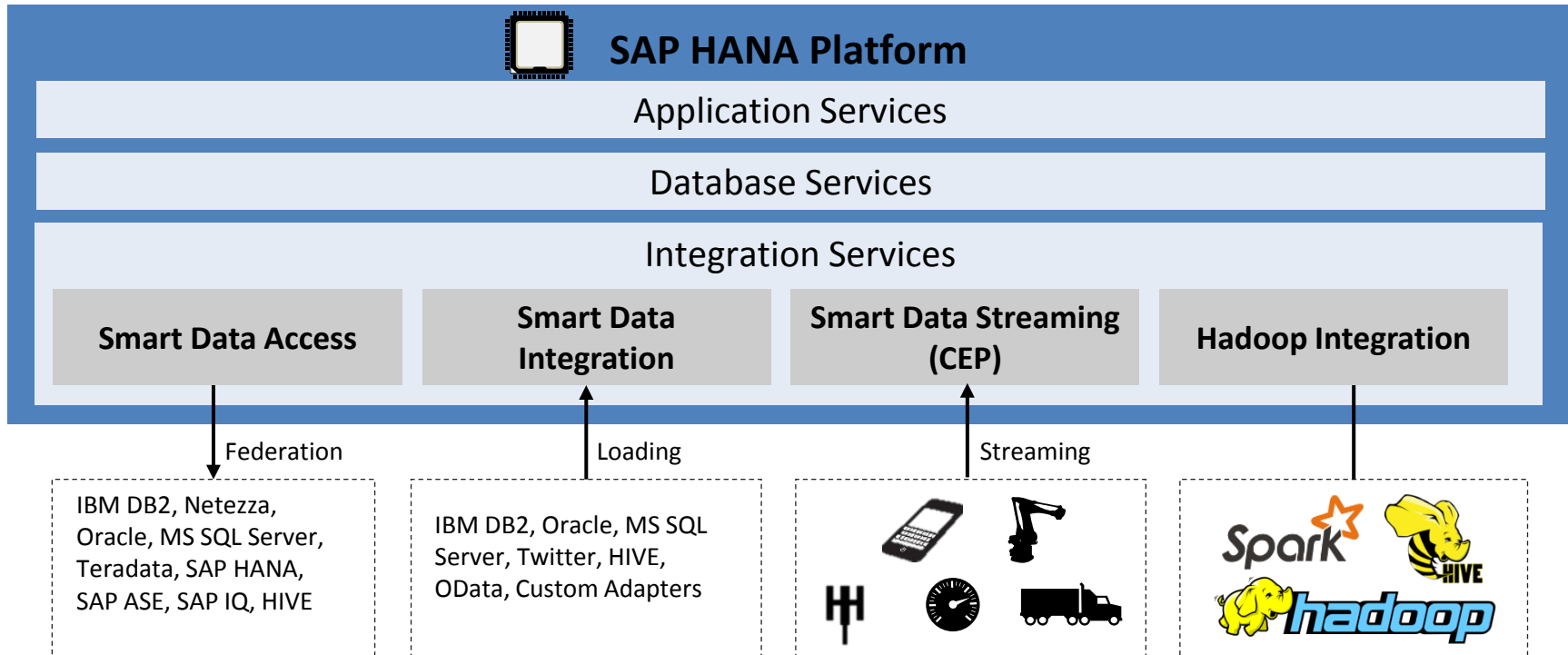
- Run applications with dramatically different datatype characteristics in the same system
- Optimize graph, planning, and rules applications on the same data
- Empower your business via built-in predictive analytics, business functions, and data quality

Application Services- Web server and database in one system reducing data movements



- Deliver consumer-grade User Experiences for any device, automatically
- Support for open development standards – HTML5, JSON, Java Script
- Built-in tools to develop, version-control, bundle, transport, and install applications

Integration Services - Data from any source for a complete view of the business



- Access information stored in data silos while keeping the data in place
- Replicate and move any type of data in real-time to the cloud and on-premise when necessary
- Capture and analyze live data streams and route to appropriate storage or dashboard
- Multiple access points from HANA to Hadoop data: thru Spark, Hive, HDFS and Map Reduce functions

Comprehensive services with in-memory computing to make information available to any application

SQL JSON ADO.NET J/ODBC OData HTML5 MDX XML/A



SAP HANA Platform

Application Services

Web Server | JavaScript | Fiori UX | Application Lifecycle Management

Database Services

OLTP + OLAP | Data Modeling | Stored Procedures | Multitenant Database Containers | Dynamic Tiering
Spatial | Predictive | Search | Text Analytics | Graph* | Planning**
Smart Data Quality | Series Data | Functional Libraries

Integration Services

Smart Data Access | Smart Data Integration | Smart Data Streaming

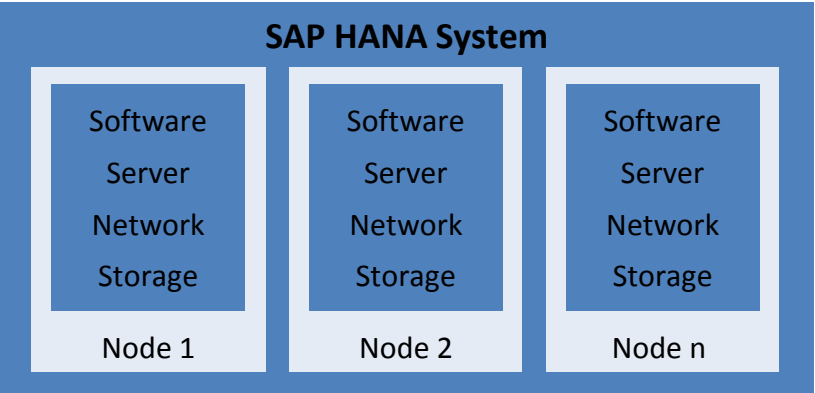
On-Premise | Cloud | Hybrid

* Graph is in controlled availability

** Not available for external use. Available with SAP products – SAP Business Warehouse powered by HANA, Business Planning & Consolidation(BPC), Sales & Operations Planning (S&OP).

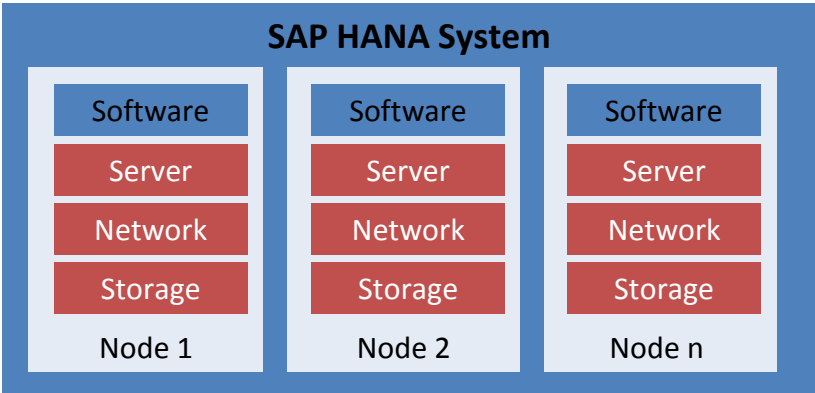
Choose the right on premise deployment option

Appliance



All in one box by certified partners

Tailored Data Center Integration



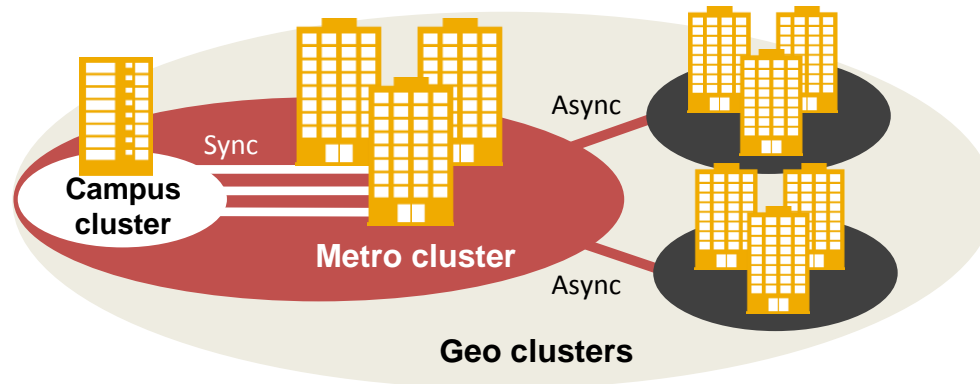
Choice of components that meet SAP requirements from different vendors



High Availability (HA) and Disaster Recovery (DR)

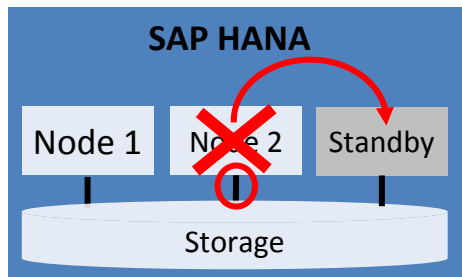
Ensuring the most demanding service-levels

Supports campus, metro and geo clusters with multiple hot standbys



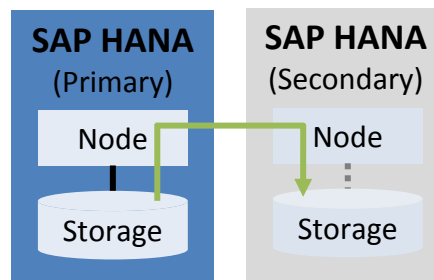
Host Auto-Failover (HA)

- Within one scale-out system
- N active nodes, M standby node(s)
- Automatically switch to standby node



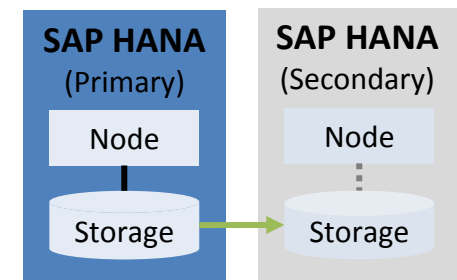
System Replication (HA & DR)

- Across multiple systems / locations
- Continuous data transfer from memory
- Fast switch-over on system failure



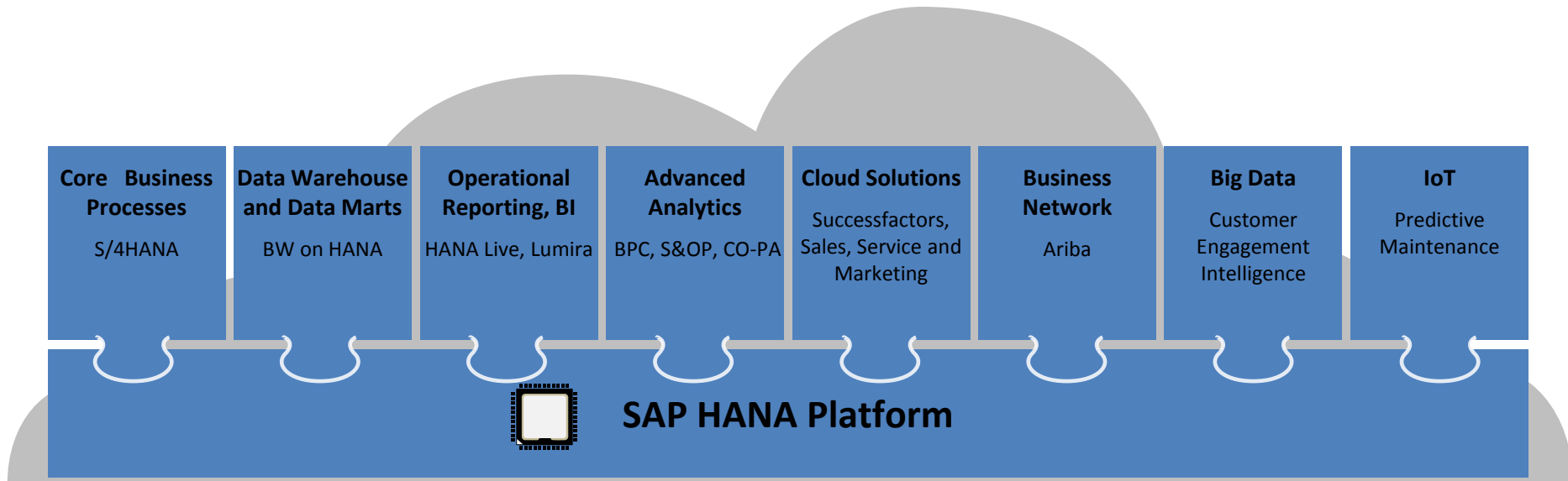
Storage Replication (DR)

- Across multiple systems / locations
- Transfer data using storage mirroring
- Low cost option



Secondary system can be used for Dev/QA.

All SAP applications run better with in-memory computing



Common use cases



Optimizing Business Operations

Get instant insights into real-time transactions to optimize business operations



Operational Reports, Dashboards, and Analytics

Analyze and visualize operational details to support your day-to-day activities



Real-time Operational Intelligence

Run queries against operational data, streams and events to deliver real-time insights



Data Warehouse and Data Mart

Deliver actionable insights on enterprise-wide or departmental data



Big Data

Uncover the value in large, complex and rapidly growing data sets



Decision Support, Simulation and Automation

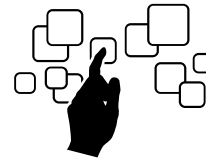
Streamline and automate business processes with advanced analytics

Deliver results for business today



5,800+

SAP HANA customers



1,850+ SAP Business Suite and
1,600+ BW powered by SAP HANA
customers



Forrester reports **37%**

cost savings using a single
system for Analytics and
Transactions



1,800+ startups from **57**
countries innovating on SAP HANA



10,000 times faster reports



37+ SAP HANA Cloud Data Centers
Worldwide
(from SAP and IBM)



Run Simple.

Thank you.