IN-MEMORY COMPUTING TECHNOLOGIES:
NOW AND TOMORROW

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Essential insight for leaders of the digital economy.

IN-MEMORY COMPUTING TECHNOLOGIES: NOW AND TOMORROW

- Jason Stamper, Analyst, Data Platforms & Analytics, 451 Research

Research & Data

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- TEMPOIQ
- GUAVUS
- AWS
- ORACLE
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Analytic Database

- TEMPOIQ
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- BRYTLYT
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- INFOBRIGHT
- INTERANA
- KOGNITIO
- KX SYSTEMS
- PARADIGM4
- PARSTREAM
- SNOWFLAKE COMPUTING
- SPACECURVE
- XTREMEDATA
- HP
- SAP
- ACTIAN
- DEEP IS
- GOOGLE
- INTERSYSTEMS
- JUSTONEDB
- MEMSQL
- NUODB
- IBM
- ORACLE
- AWS
- PIVOTAL
- MICROSOFT
- CRAY
- TERADATA
- TREASURE DATA

Operational Database

- ACTIAN
- DEEP IS
- GOOGLE
- INTERSYSTEMS
- JUSTONEDB
- MEMSQL
- NUODB
- IBM
- ORACLE
- AWS
- PIVOTAL
- MICROSOFT
- AEROSPIKE
- ALTIBASE
- ARANGODB
- BASHO TECHNOLOGIES
- CLEARDB
- CLUSTRIX
- CODEFUTURES
- CODERSHIP
- COUCHBASE
- CUMULOGIC
- DATASTAX
- DATOMIC
- ENTERPRISEDB
- FAIRCOM
- FATCLOUD
- CENTURYLINK (ORCHESTRATE)
- RACKSPACE
- SPLICE MACHINE
- VMWARE
- SAP
- COMPOSE
- MARKLOGIC
- GROVESTREAMS
- HEROKU
- KOVERSE
- MARIADB
- MONGODB
- MONGOLAB
- NEO TECHNOLOGY
- OBJECTIVITY
- ORIENTDB
- PERCONA
- RETHINKDB
- SCALEARC
- SCALEBASE
- SCALEDB
- SPARSITY TECHNOLOGIES
- SQRRL
- STARCOUNTER
- TESORA
- TRANSLATTICE
- VOLTDB
- VT ENTERPRISE
- REDIS LABS
- SOFTWARE AG

Hadoop

- GUAVUS
- ALTISCALE
- BLUEDATA
- CLOUDERA
- DATABRICKS
- HORTONWORKS
- JETHRODATA
- MAPR TECHNOLOGIES
- METASCALE
- PEPPERDATA
- QUBOLE
- STRATIO
- WANDISCO
- TREASURE DATA
- TERADATA
- CRAY
- MICROSOFT
- PIVOTAL
- AWS
- ORACLE
- IBM
- CENTURYLINK
- RACKSPACE
- SPLICE MACHINE
- VMWARE
- XPLENTY
- ZETTASET

Log Management

- SUMO LOGIC
- TIBCO
- HP
- LOGENTRIES
- LOGGLY
- SPLUNK

Search

- HP
- TIBCO
- SAP
- COMPOSE
- MARKLOGIC
- IBM
- ATTIVIO
- ELASTICSEARCH
- LOKAD
- RECOMMIND
- SRCH2
- THOUGHTSPOT
- LUCIDWORKS

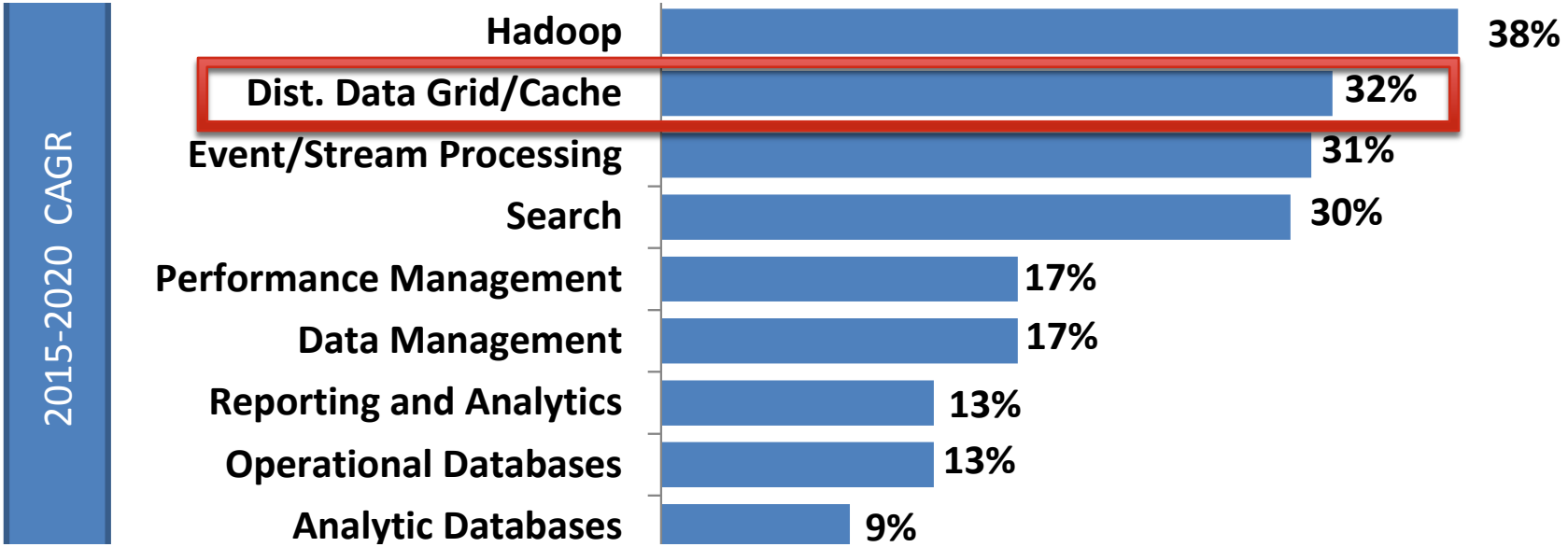
Grid/Cache

- REDIS LABS
- SOFTWARE AG
- IBM
- ORACLE
- AWS
- PIVOTAL
- GRIDGAIN SYSTEMS
- HAZELCAST
- MEMCACHIER
- SCALEOUT SOFTWARE

- **98%** of CIO's confirm there is a "significant" gap between what the business expects, and what IT can deliver.

Source: CBR 2014 – 200 UK-based CIO's.

DATA PLATFORMS GROWTH BY SEGMENT…



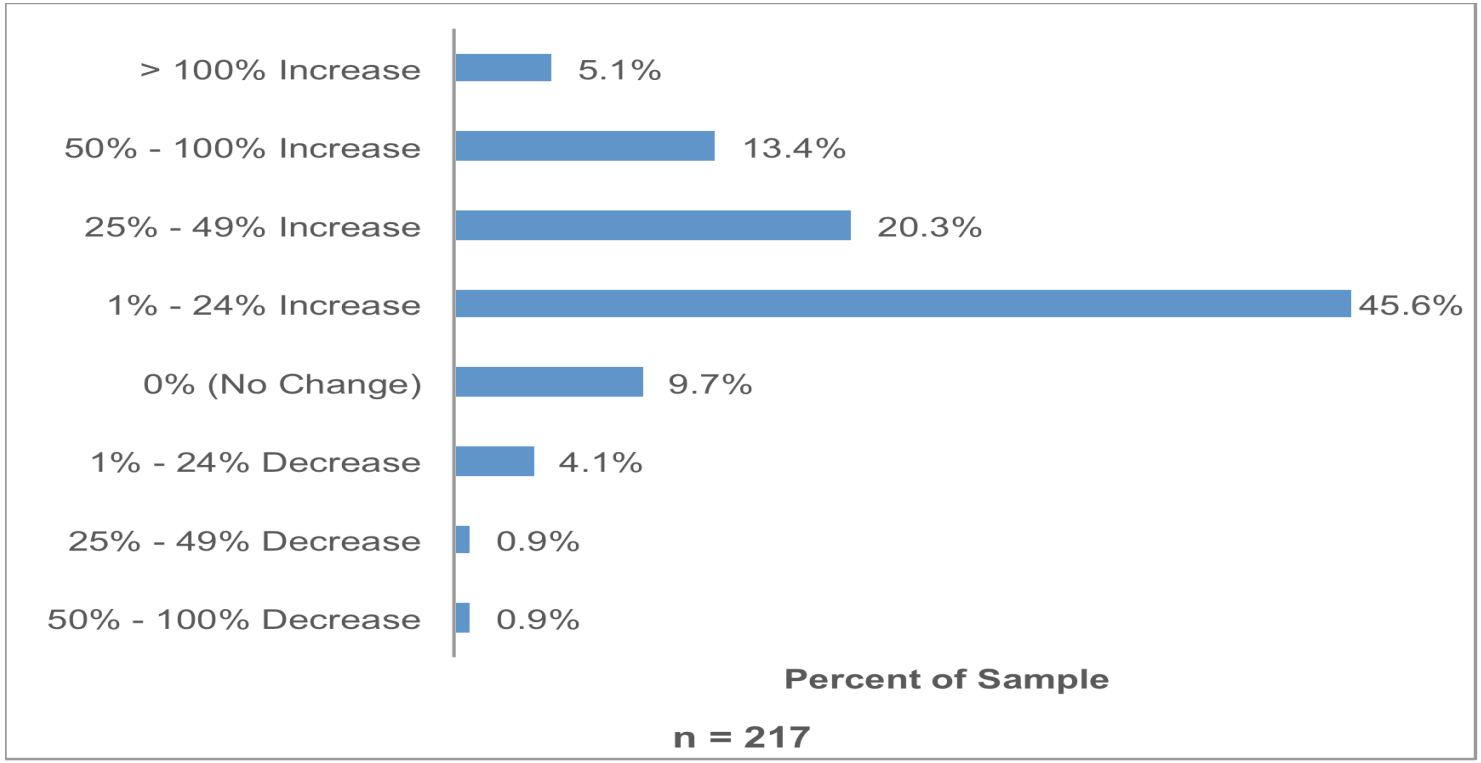
SOURCE: 451 MARKET MONITOR Q1 2016

- New development approaches demand new architecture
- New dev approaches enable new lightweight apps
- Distributed architecture enables new applications

- New app requirements demand new development approaches
- Distributed architecture encourages new development approaches
- New applications require distributed architecture

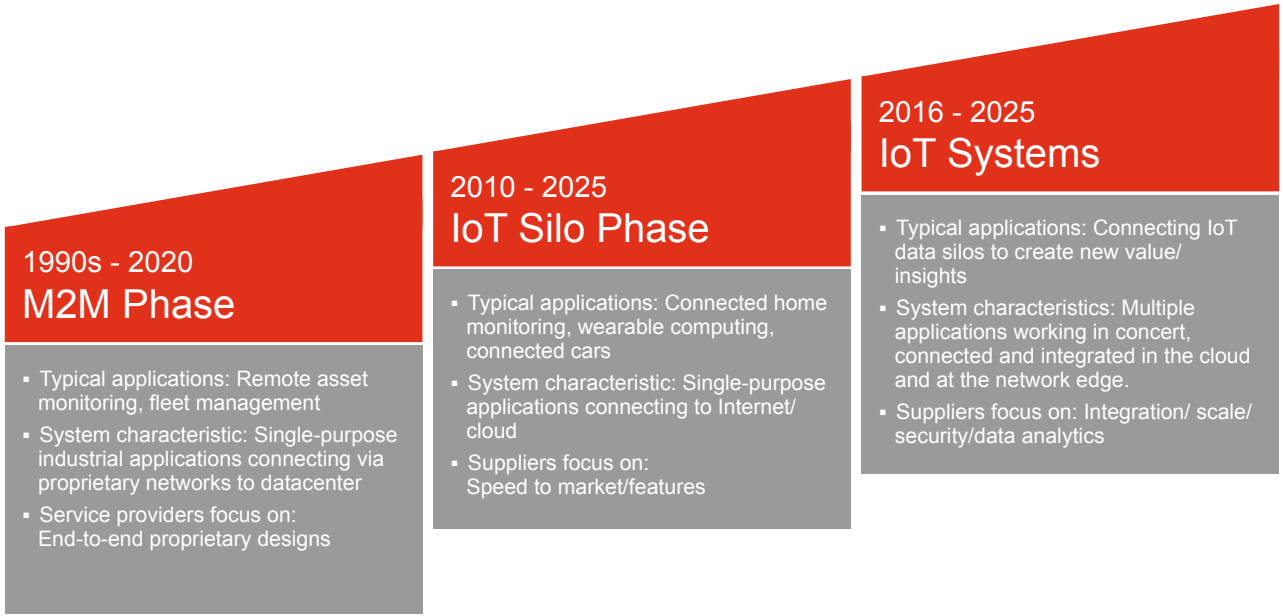
THE INTERNET OF THINGS: A DRIVER FOR IN-MEMORY

Q: Approximately how much do you expect your organization's overall IoT spending to change over the next 12 months compared to the previous 12 months?



Source: 451 Research, Voice of the Enterprise: Internet of Things, Budgets and Outlook 2016

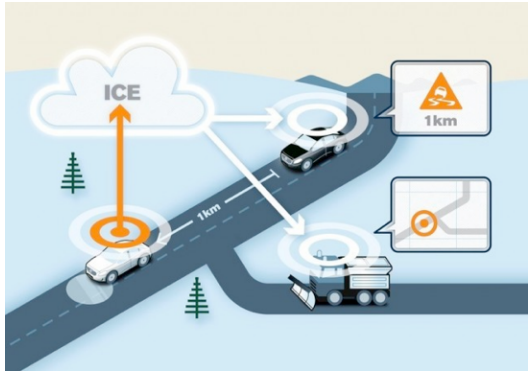
IOT MATURITY GROWING...



NEW USE CASES FOR IOT…

WILSON FOOTBALL

VOLVO CONNECTED CARS



SAMSUNG IOT FRIDGE/FREEZER

BUT WHAT'S NEXT FOR IN-MEMORY?

- Latency sensitivity concerns becoming even more widespread
- Hybrid transactions and analytics becoming table-stakes
- In-memory data grids seen as a full data platforms in their own right
- Increasing use of new types of memory that has the performance of memory with the resilience of disk – for example non-volatile RAM (NVRAM)
- More organizations looking to store *all* data in memory

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IN-MEMORY COMPUTING:
THE NEXT 24 MONTHS

Nikita Ivanov, Founder & CTO
GridGain Systems

May 17, 2017

NVM – Non-Volatile Memory

- Data is retain when power is out
- Removes the need for similar fault tolerance on software level
- Somewhat slower then DRAM but cheaper
- Necessary last puzzle piece for 100% in-memory storage
  - HDD & flash will rapidly become literally “extinct”.
- Shipping this year: 3D XPoint

ML/DL + IMC = ❤

- ML/DL on small dense data sets = solved
- ML/DL on large sparse data sets = ***not solved***
  - Requires big & fast data management system to:
    - 1. Store TB and PB of data
    - 2. Fast parallel computations
- IMC systems like GridGain are ***ideally*** suited for the tasks
- Apache Ignite 2.0 introduces ML Grid

Petabytes Of… RAM?

- Petabytes of RAM… not feasible in the next 10 years
  - However, Fujitsu M10 can host up to 64 TB of DRAM on a single server
- Hybrid storage model (RAM/FLASH/HDD) can store petabytes today
  - Data automatically moves between layers
  - Seamlessly "gravitating" to the fastest layer
- Key is ***uniform APIs*** for data processing on hybrid storage
  - Memory first vs. disk first architecture
  - The more memory, the faster the processing

SQL… Still The King!

- Despite of decade of bad press − SQL is still #1 data processing paradigm in enterprise
- IMC should embrace SQL ***additionally*** to NoSQL, streaming, ML/DL
- No serious (or semi-serious) usage of IMC without SQL today
  - As IMC mature so is SQL requirements
- Look at Google Spanner and Apache Ignite 2.1 for advances in **Distributed SQL**

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THANK YOU!