# What Needs to Happen for Flash to go "Mainstream"

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# Should the Title of this talk be in the past, present or future tense?

- "The flash-based array market, which includes both all-flash arrays (AFAs) and hybrid flash arrays (HFAs), is on fire." *IDC, "Worldwide All-Flash Array and Hybrid Flash Array 2014–2018 Forecast and 1H14 Vendor Shares", Eric Burgener et al, 2014*

- Survey of 1,500 respondents of the TechTarget's survey of IT professionals showed: 51% of data centers have deployed some form of Flash and 31% more evaluating. Rich Castagna, http://searchsolidstatestorage.techtarget.com/feature/Solid-state-flash-storage-now-a-mainstream-choice

- Calvin Zito (HP) in February 2015 wrote an article entitled, "News Flash: 2014 is the Year That Flash Storage Went Mainstream."

# Other Pertinent Statistics

- ## 64% still use Hybrid Arrays
  - ### 61% planning to add additional Hybrid array capacity
- ## 30% use All Flash Arrays
- ## 51% use it to accelerate performance of existing applications

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# Mainstream?

- Flash usage has increased and is increasing quickly
- Hybrid Flash Arrays are dropping in revenue
- But All Flash Arrays not yet the ubiquitous form of storage it will be in a few years
- **All Flash Arrays will be the Storage of Choice for Active Data**

# Active Data

- Mission Critical application(s)
- Must be retrievable with low latency
- Wide range of access rates and densities
- For example, your X-ray taken 5 years ago but needed by the doctor immediately while he is seeing you.
- The application's ability to meet its SLAs depends on the low latency of the data
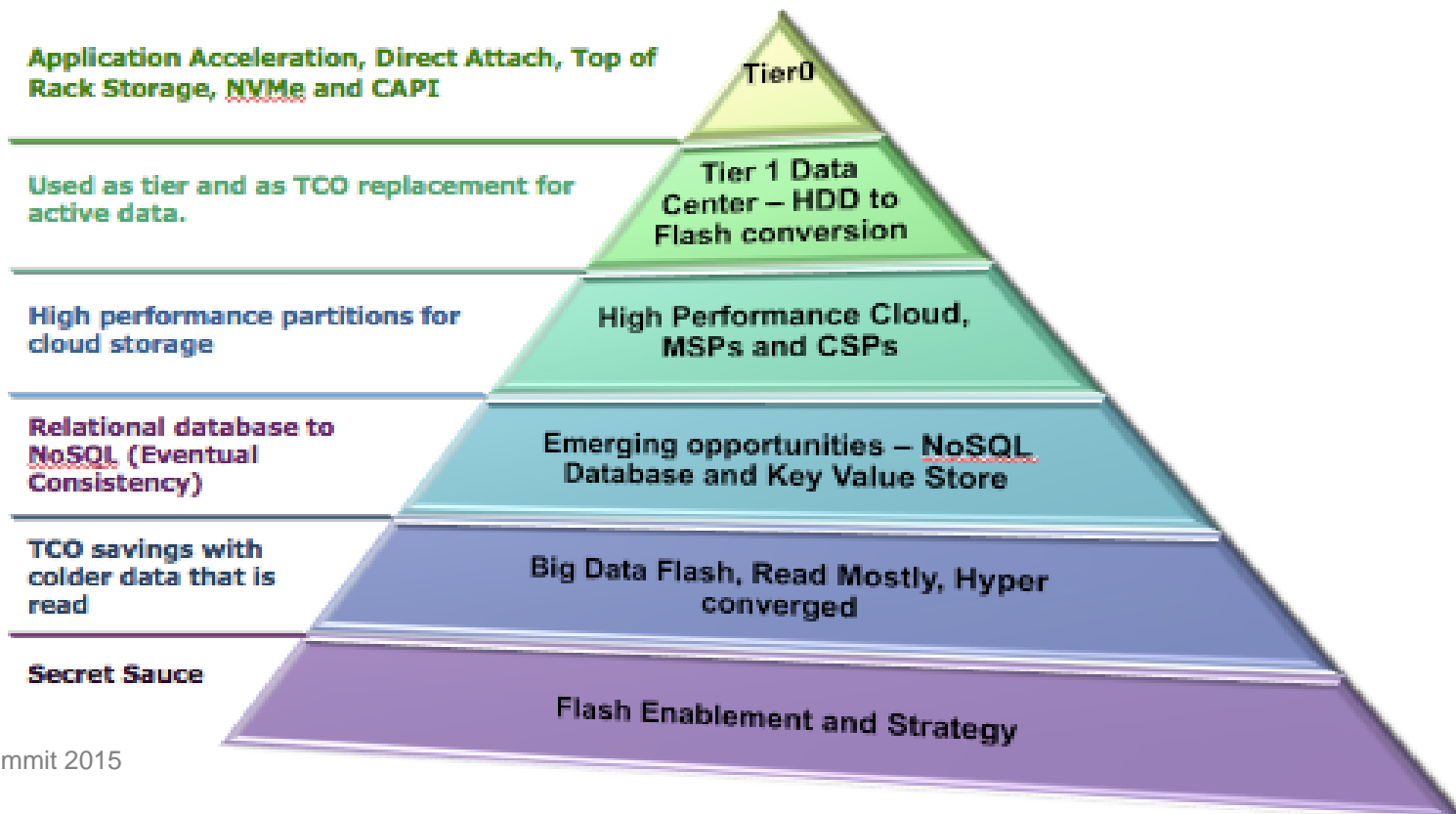
- Switch to TCO as financial measurement for purchases

- Virtualization allowing concurrent and simplified Data Migration.

- Full compliment of Data Services including replication, Snapshots, APIs, QOS

- High Quality and full data protection

- Simplified management – Less DBAs, easier to manage, simpler to use.

- Cost of Acquisition has dominated decisions
- TCO is already driving many flash decisions
  - Internet Data Centers
- Cost after Data Reduction
- Significant energy and cooling savings
- Concurrent Migration can save up to 25% of Depreciation cost

- World class Data Migration and Virtualization
- Completely integrated management
- Full suite of Snapshots and Replication services
- Full GZIP Compression with Temporal Locality
- Outstanding performance and latency in real workloads
  - Data Reduction can be turned off on LUN basis

# Flash Everywhere



Application Acceleration, Direct Attach, Top of Rack Storage, NVMe and CAPI
— Tier0

Used as tier and as TCO replacement for active data.
— Tier 1 Data Center – HDD to Flash conversion

High performance partitions for cloud storage
— High Performance Cloud, MSPs and CSPs

Relational database to NoSQL (Eventual Consistency)
— Emerging opportunities – NoSQL Database and Key Value Store

TCO savings with colder data that is read
— Big Data Flash, Read Mostly, Hyper converged

Secret Sauce
— Flash Enablement and Strategy

**http://www-03.ibm.com/systems/storage/flash/**