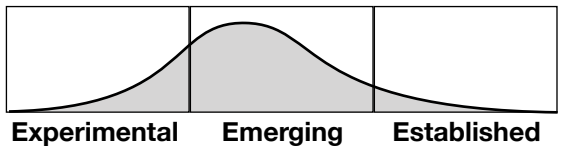
2020 CSO Trends

Note on Trend Categorization

Technology trends are collections of related and supporting technologies that often develop at different rates and times. Categorization of these technology trends into “Experimental”, “Emerging” and “Established” is somewhat subjective, as each trend will include aspects that fit in the other two categories. The approach that ATG has taken is to look at where the bulk of the “area under the curve”, as shown in the diagram on the right.



Experimental Technology Trends

- Known within research community
- Not widely adopted by Industry
- Value have significant uncertainty
- Little to no adoption within NetApp

5G and MEC NEW

New architectural models enabled by 5G latency, bandwidth, and edge-adjacent cloud computing and storage: Mobile Edge Computing (MEC). Includes large-scale IoT and IIoT deployments enabled by connectivity improvements and cost reductions.

Blockchain

Technologies that enable the creation of decentralized indelible ledgers that allow multiple parties to agree on a consistent state of the world without requiring trust of each other or a third party.

Computation Reorganization

Changes to optimal computer system organization resulting from changes in CPU/cache/bus/network/storage/accelerator balance and economics.

Data Containerization NEW

Technologies that enable packaging, cataloging, provenance, management, and mobility of data sets and collections, similar to how applications are containerized.

Quantum Computing NEW

Technologies that use the properties of quantum mechanisms to enable new capabilities in computing, data storage and networking.

Emerging Technology Trends

- Known within storage industry
- Adoption by startups and R&D
- Value are generally understood
- Investigation/design within NetApp, but typically not yet productized

Edge Computing

Changes to topological models that have “edges” connected to clouds. Includes rebalancing what types of computation and data storage happen at each location, and how caching, scheduling and data transfer changes.

Cloud-Native Databases NEW

New approaches to “born-in-the-cloud” databases that take advantage of unique cloud capabilities, including cloud-scale compute, burst capabilities, multiple availability zones, and “as-a-service” consumption models.

Cloud-Native Development

Emerging programming and runtime models, including APIs, containers, coordination, orchestration, service abstraction and proxying, and different granularities of billing and metering such as billing per function execution.

Proactive Data Defense

Techniques that allow storage-related proactive detection, impact minimization and recovery from threatening activity, such as ransomware and other malware, sabotage, data exfiltration, encrypted data enclaves, DRM, etc.

Self-Managing Systems NEW

Techniques to automate and optimize system deployment, connectivity, configuration and operation based on operational data, usage and stored data.

Established Technology Trends

- Common knowledge
- Implementations from competitors
- Value assumed (“table stakes”)
- Part of shipping NetApp products

Analytics/AI/ML

Technologies that allow insight and derivative data to be extracted from data sets, including search, transformations, prediction, anomaly detection, decision making, etc.

Data Protection

Technologies that reduce the probability of data loss or corruption, including RAID, erasure coding, replication, checksums/hashes, etc.

Policy-based Management

Technologies that allow desired behaviours to be expressed through policies, such as SLOs, access controls, protection behaviours, etc.

Solid State Storage

Technologies associated with managing and using flash storage and persistent memory storage devices, including programming model changes.

Storage Efficiency

Technologies that reduce the amount of storage required, including techniques such as de-duplication, compression, versioning, etc.

The following cross-cutting concerns apply to all areas:

Security, reliability, usability, manageability.

Rev 3, 2020-02-21