Orchestration & IO Performance Optimization using storage analytics

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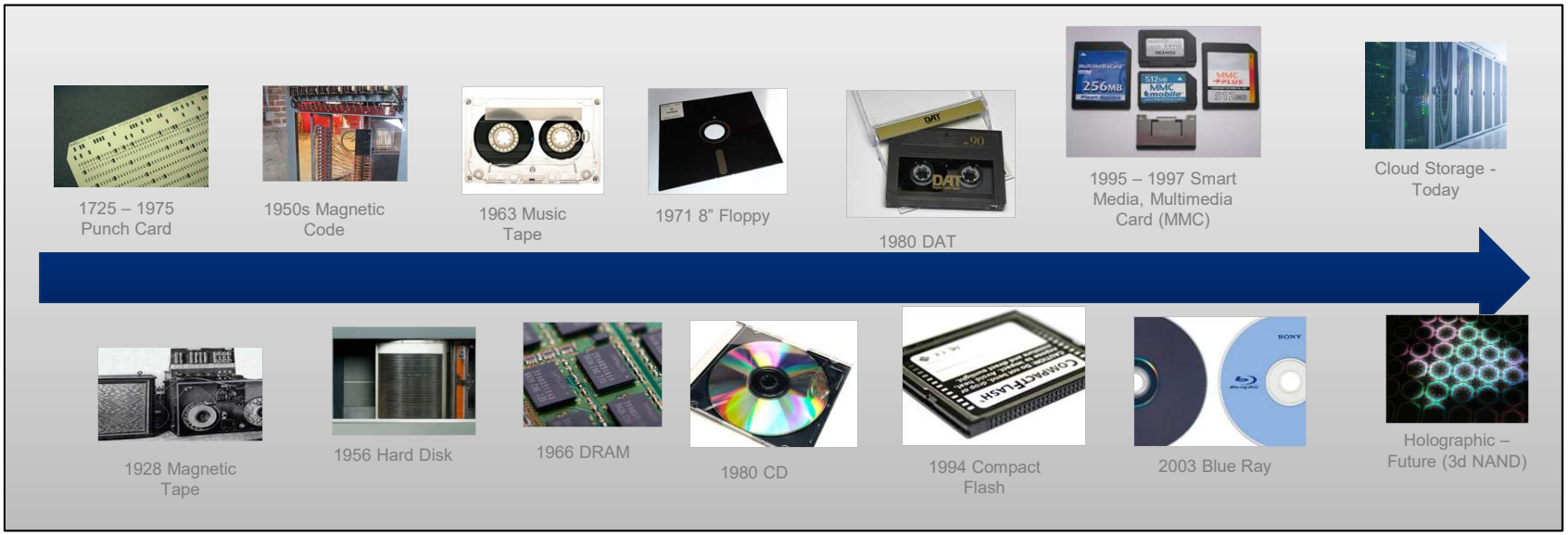
Introduction

Evaluation of Computer Storage Media



Innovation & Driving Factors

Size
- From Factor
- Compactness

Speed
- Faster Response
- Higher Throughput
- Efficient Random Access

Robustness
- Fault tolerant
- Retention
- Long Life

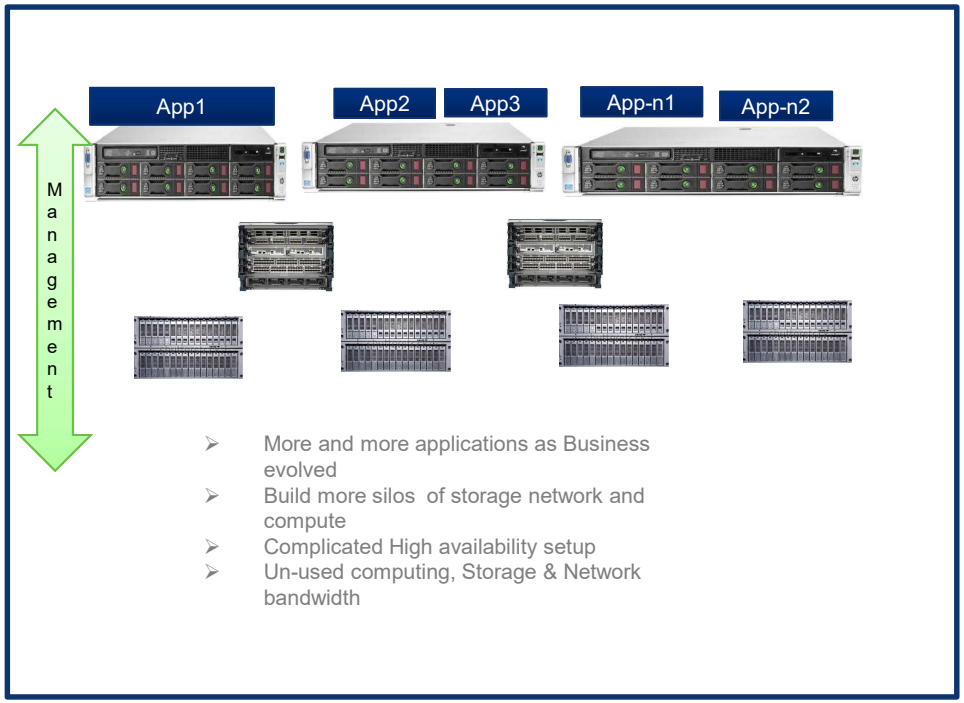
Power Requirements
- Power efficiency
- Heating

Enterprise Applications – Early Days

- Mainframe Compute
- High Reliability
- High Cost - unaffordable

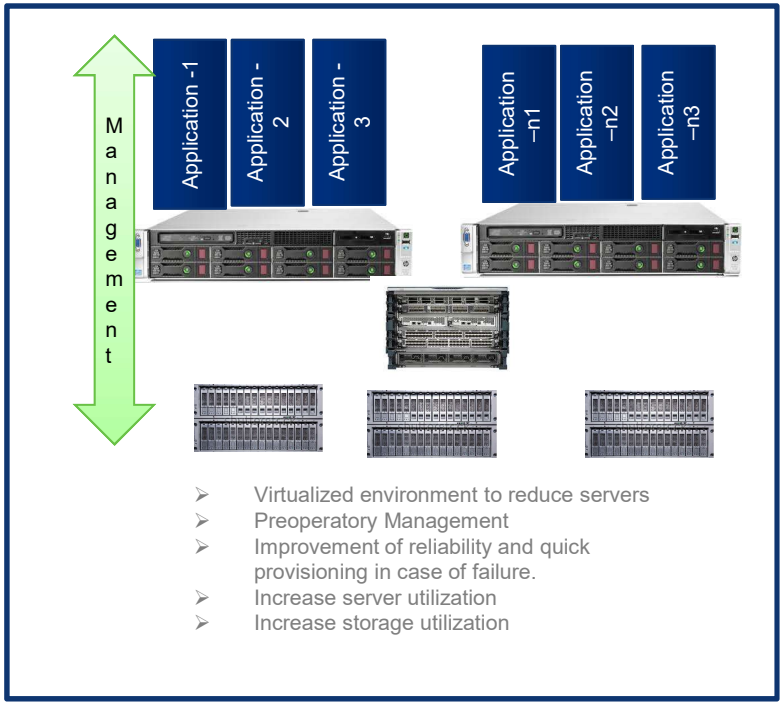
- Migration to low cost commodity server
- Compute, data and Networking components scattered

Evolution of IT Infrastructure



- More and more applications as Business evolved
- Build more silos of storage network and compute
- Complicated High availability setup
- Un-used computing, Storage & Network bandwidth

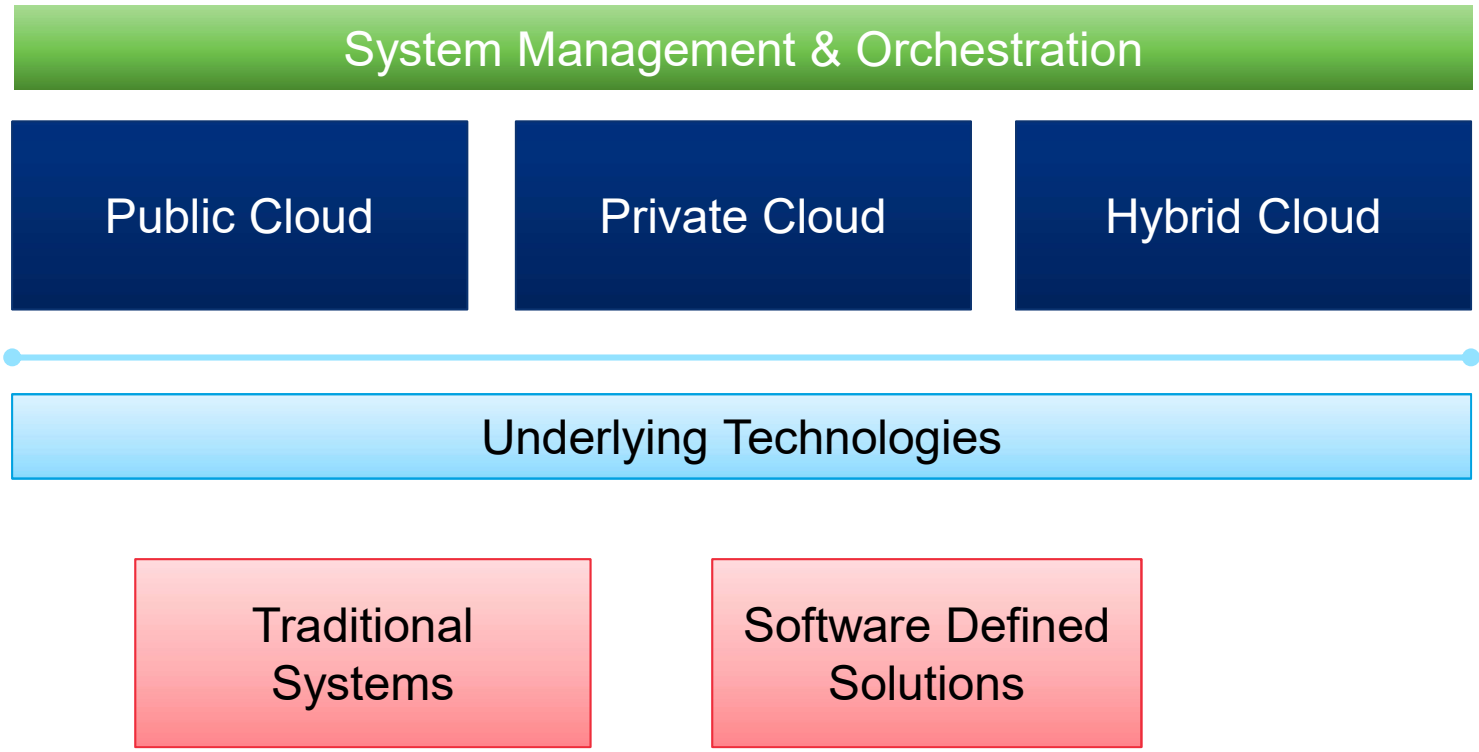
Traditional Infrastructure



- Virtualized environment to reduce servers
- Preoperatory Management
- Improvement of reliability and quick provisioning in case of failure.
- Increase server utilization
- Increase storage utilization

Virtualized Infrastructure

Cloud Infrastructure – Public / Private Data center



Challenges & Oppertunities

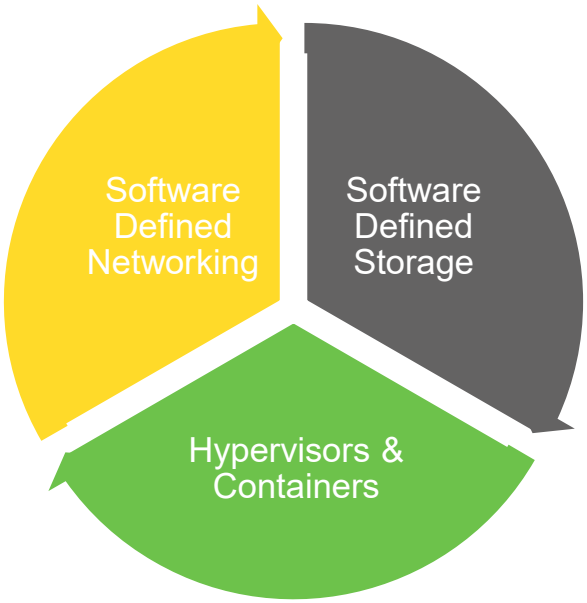
- Almost doubling in size every two years
- Data is useful only when analyzed
- Surging capacity needs

- Storage Capacity and Performance Optimization
- Identification of data
- Automated Multi-tiered storage
- Optimal Network Utilization

- Fault tolerant System
- Transparent failover
- Pre-fetching

- Better infrastructure management
- Workload swapping
- Cost control

New Software powered infrastructure

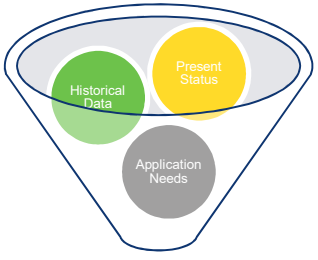


- Centralized & Dynamic provisioning
- Performance Optimization
- Cold storage/archiving
- Simplified Management
- Speed of service delivery
- Tiered storage automation
- Fault tolerant
- Central Monitoring

Improved Orchestration ..

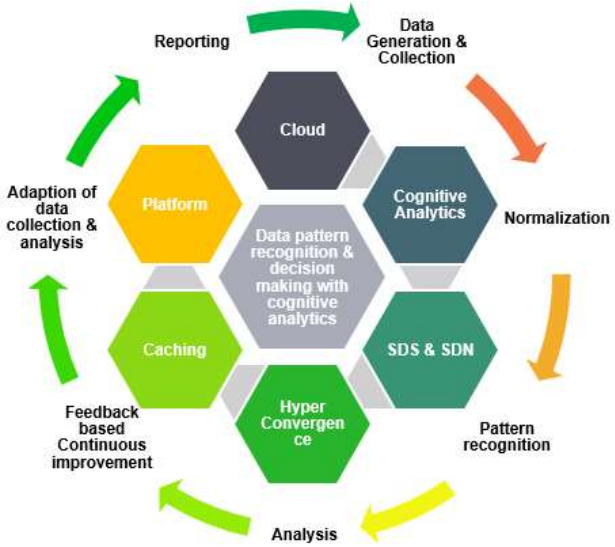
Orchestration with I/O Analytics

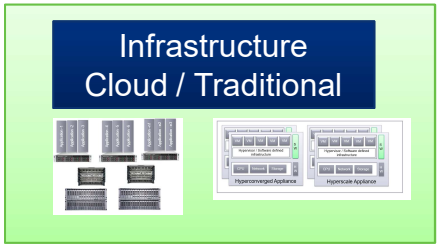
Intelligent Orchestration



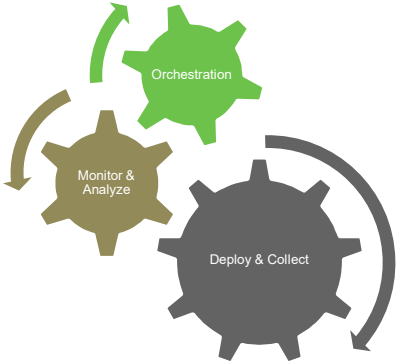
Analytics

Monitoring & Reporting



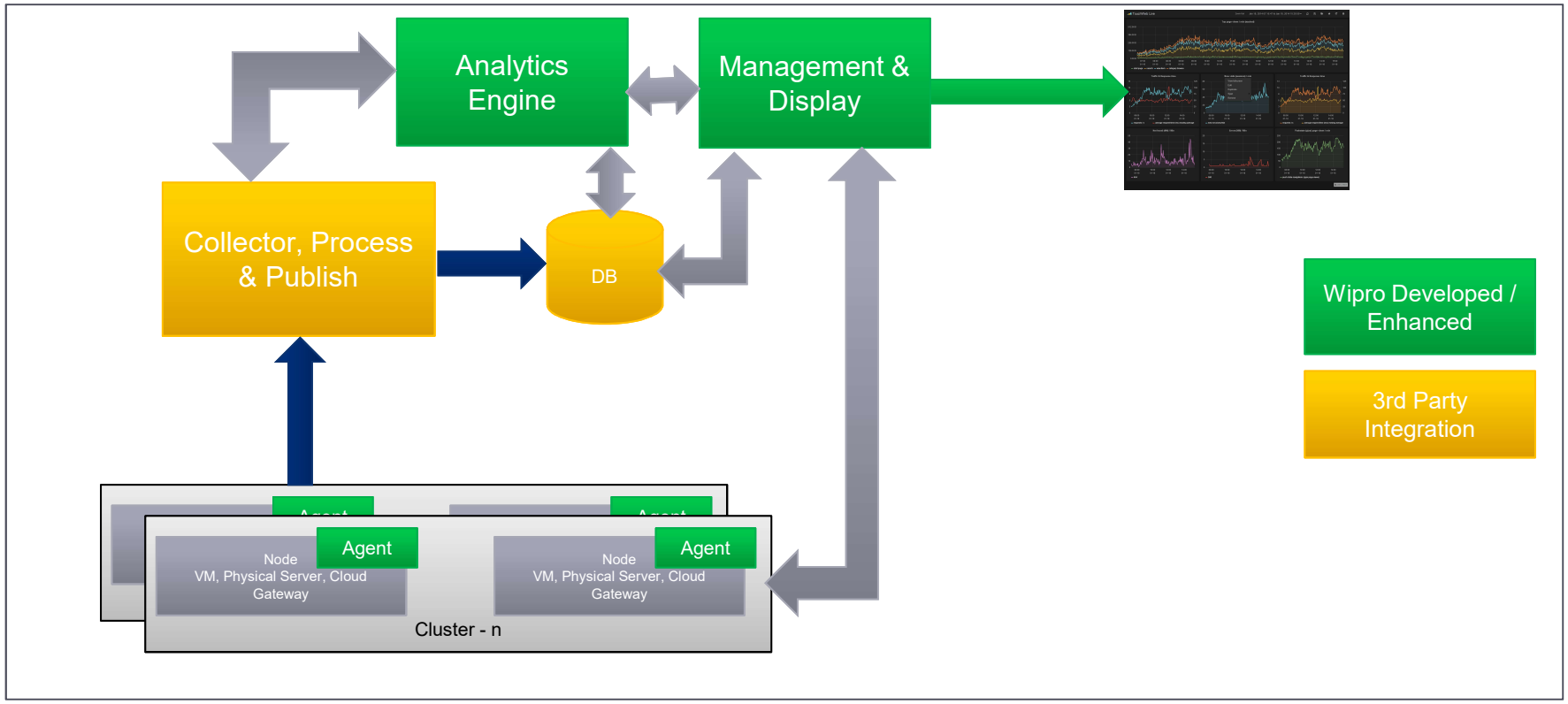


Infrastructure & Application

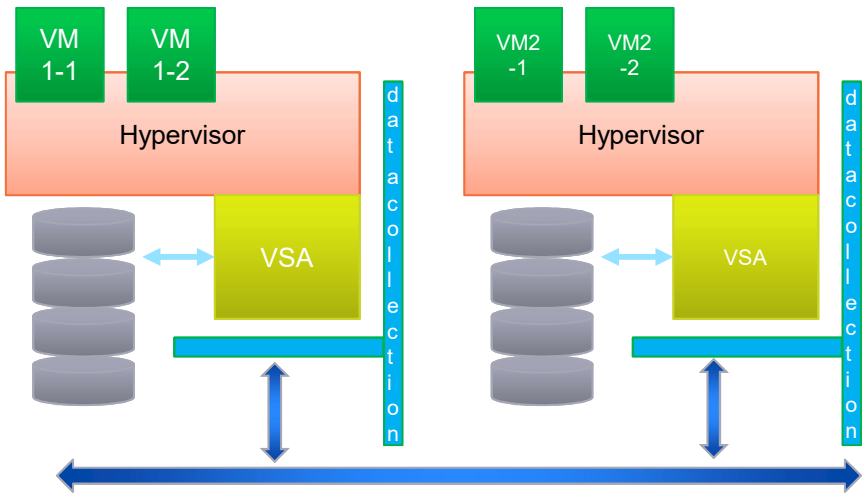


Orchestration

Data Collection & Analysis – Building Blocks



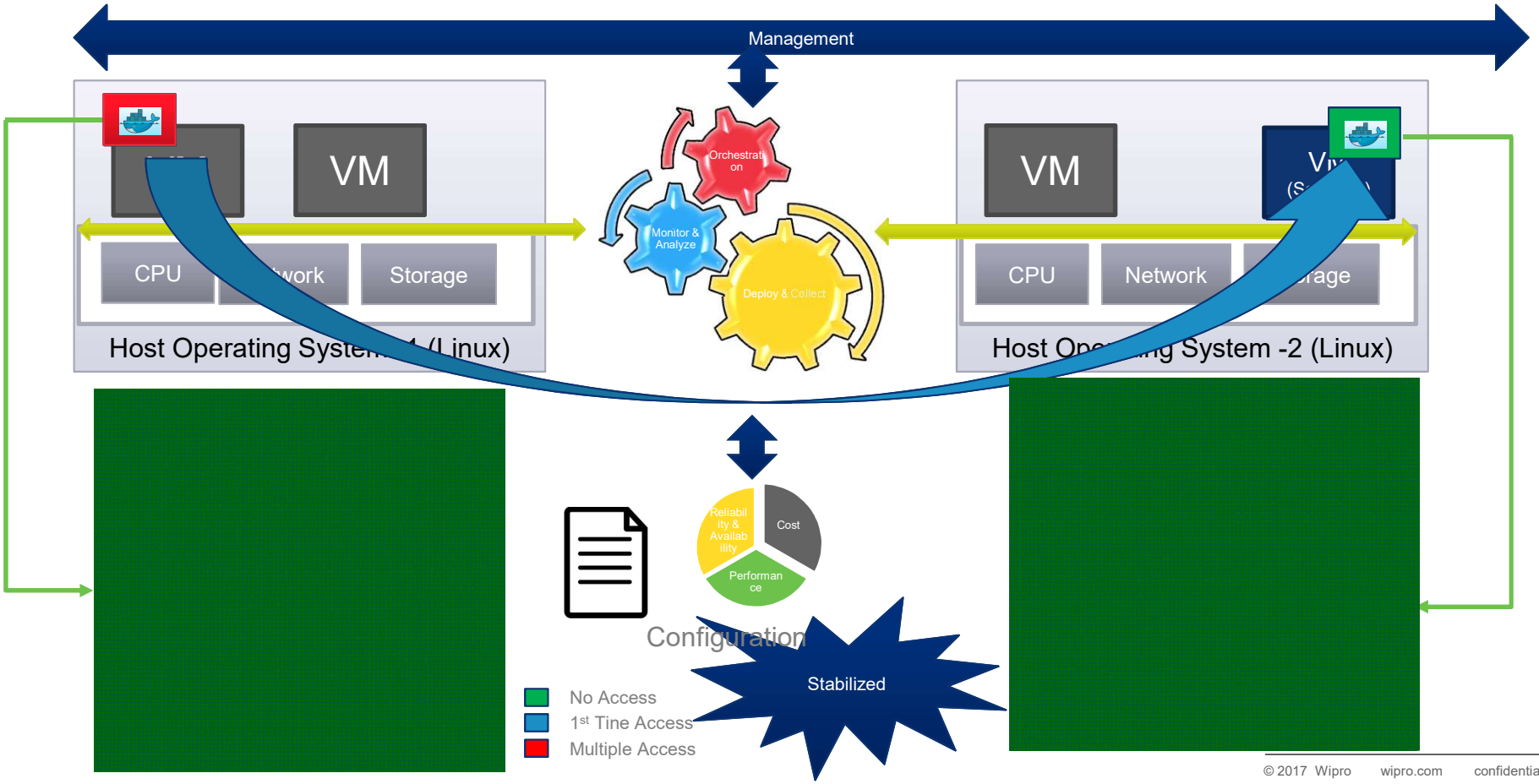
Web Application in Action



- Web Application
  - Collect data & analyze bottlenecks
  - Measure Performance Metrics
  - Orchestrate intelligently within user defined parameters & plan (Scale-out / Scale-up)

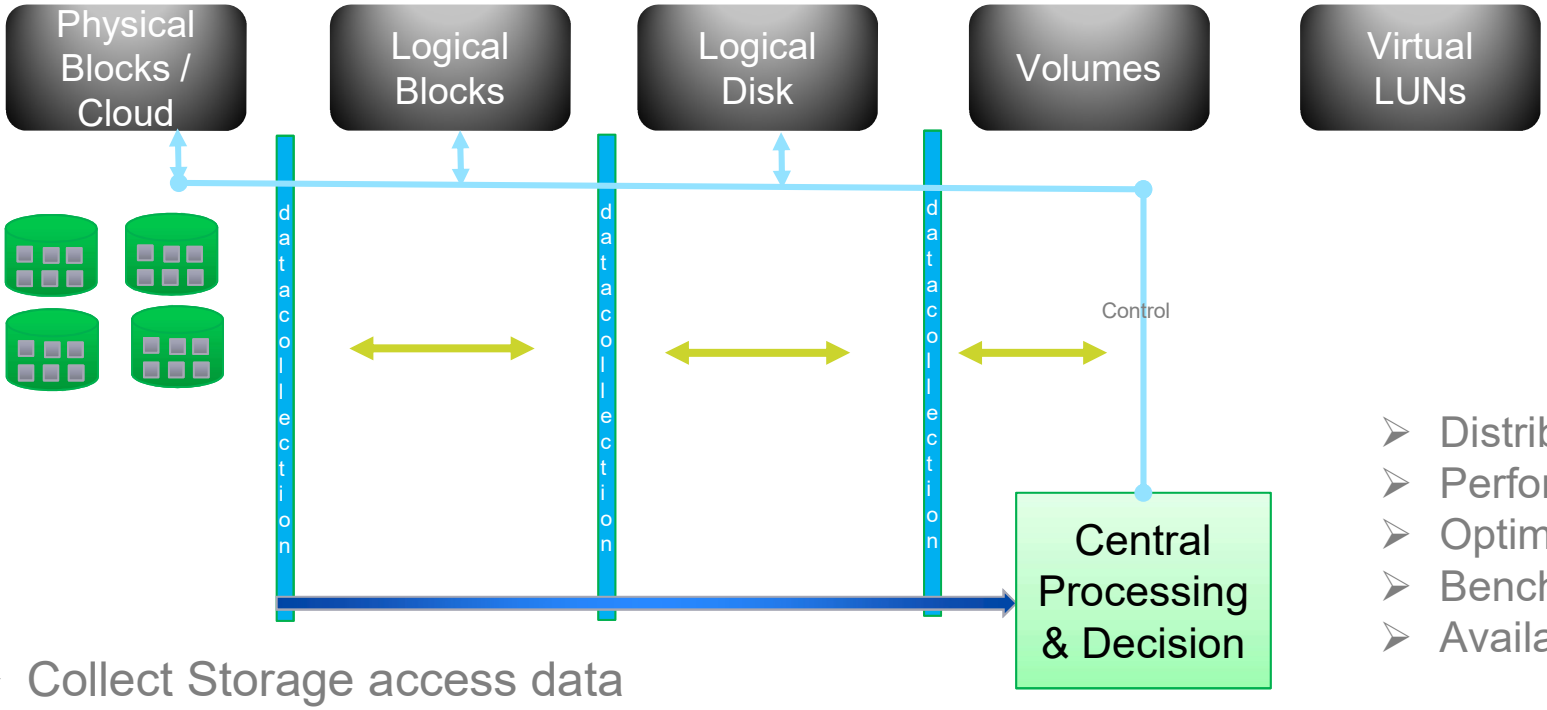
- Customer & Data center Benefits
  - Dynamic & efficient utilization
  - Cost optimization with Just-in-time scale-out / scale-up

Demo …


Management
VM
CPU
Storage
Orchestrati on
Monitor & Analyze
Deploy & Collect
VM
CPU
Network
Reliabil ity & Availab ility
Cost
Performan ce
Configuration
Stabilized
No Access
1st Tine Access
Multiple Access

Use Case & Benefit

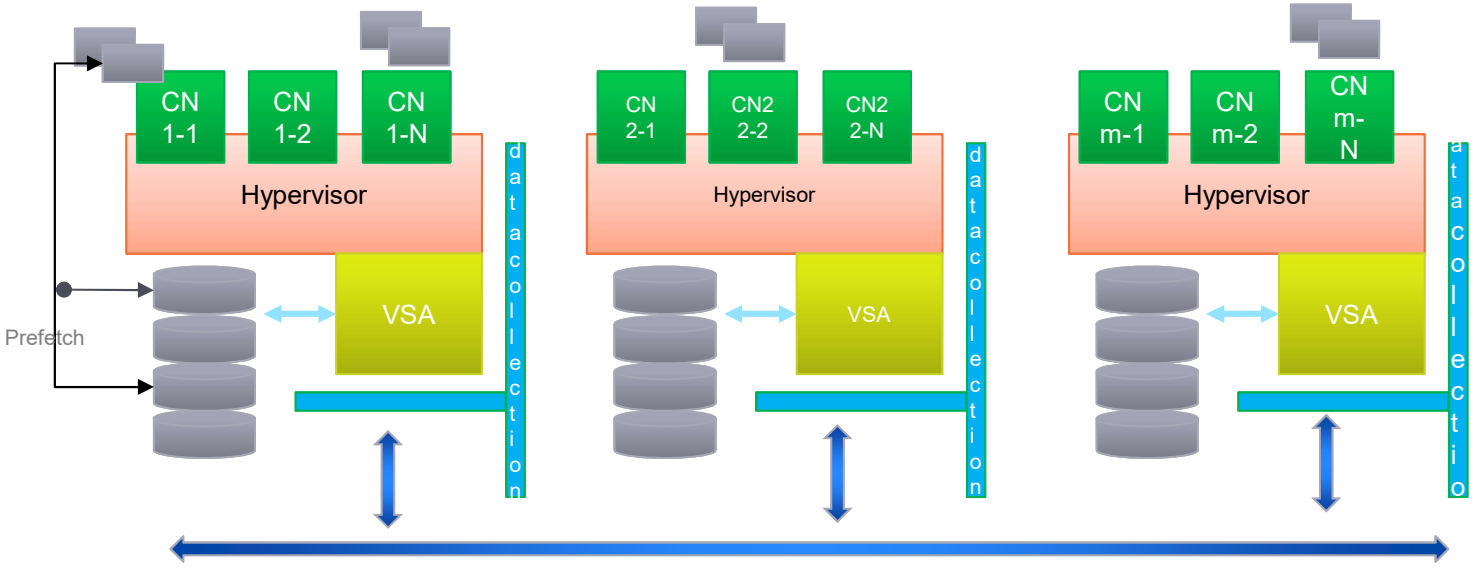
DFS Nodes – I/O Pattern & Load



- Collect Storage access data
- Get compute and memory statistics
- Collect Network Performance & Load

- Distribution
- Performance
- Optimization
- Benchmarking
- Availability

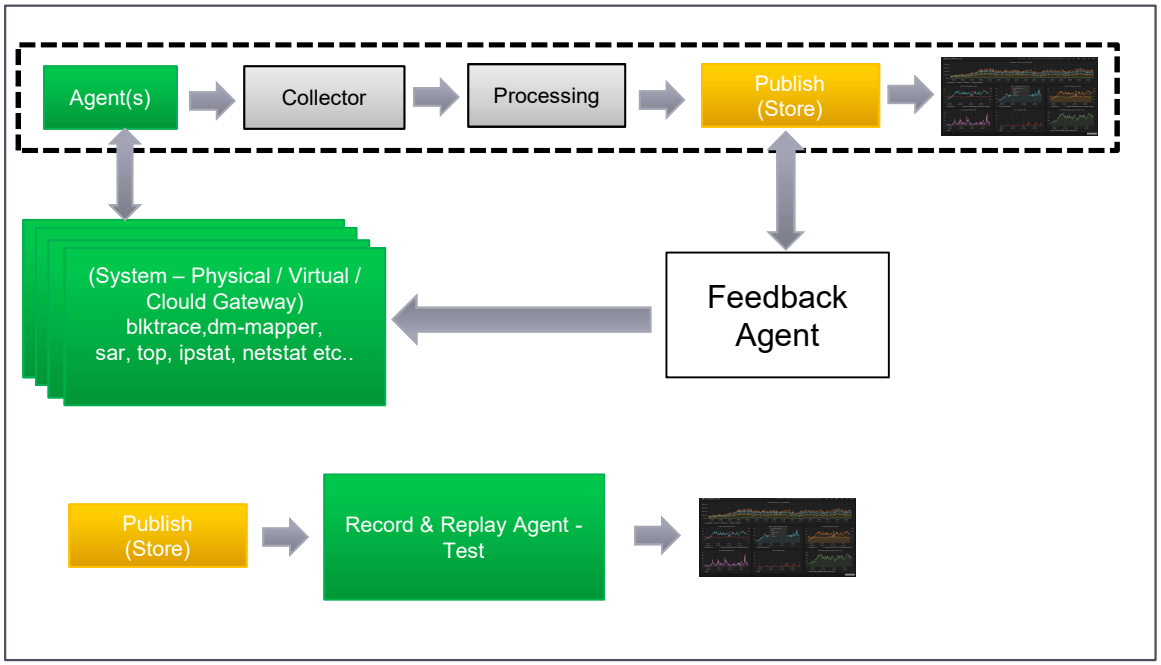
Batch Processing with I/O Pattern & Application Tagging



- Storage Optimization
- Availability
- Predictive Pre-fetching

Central Processing & Decision

Data Analysis & Performance Benchmarking



Framework

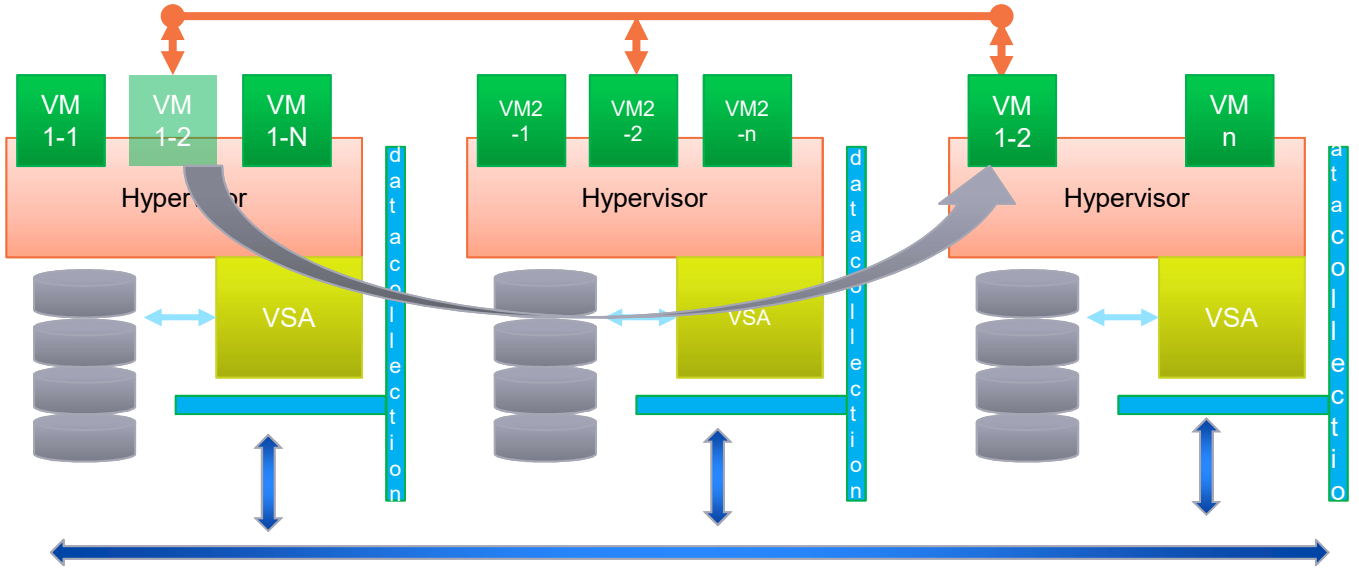
Record
- Collect
- Normalize
- Store

Analysis
- Near Real-time analysis
- Feedback
- Optimization

Report
- Monitoring
- Report

Replay
- Replay Recorded data for testing

Dynamic Load Balancing



- Load Balancing
- Optimization
- Benchmarking
- Availability
- Predictive Failures

Central Processing & Decision

- Collect Storage access data
- Get compute and memory statistics
- Collect Network Performance & Load

Questions ?

Reference

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Thank You

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