All Flash Array
Customer Case Study

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### THE CHALLENGING TRANSITION TO S.M.A.C

SMAC = Social Business, Mobility, Big Data Analytics, Cloud

#### 24x7 Expectations
- IT Efficiency: 44.0%
- Accelerate Business: 41.8%
- Reduce TCO: 38.3%
- Stability: 34.8%
- Support Change: 25.5%
- Service Development: 21.3%
- Time to Market: 19.1%
- Analytics: 14.9%
- Service/Value Center: 14.2%
- Data Protection: 10.6%
- Improve Revenue: 10.1%
- Business to IT Alignment: 9.2%
- Compliance Governance: 9.2%
- Risk Management: 2.8%

#### Too much Complexity
- LAN/Internet: 1st Platform
- Mainframe: 2nd Platform
- Terminal: 3rd Platform

#### Too much Information
- Cloud: Innovative Industry Solutions
- Emerging Markets: Social Business
- Big Data/Analytics: Mobility

#### Continually rising Costs

*Source: Capgemini – Key IT Requirements 2014*
The Coop Group is the leading retail company in Switzerland
- comprises retail companies in Switzerland as well as wholesale and manufacturing companies in Switzerland and abroad
- $28,174M CHF Total Sales Revenue in 2014 ($30B)
- $1,124 Net Sales from Online Shops (24.1% YoY Growth)
- 1971 Retail Sales Outlets in Switzerland, 199 Wholesale and Production Sites

IT Technology Profile
- Core business runs on SAP with Oracle, on IBM P-Series Servers with AIX
- Using SAP/HANA for realtime business intelligence
- Other Platforms e.g. VMware, Solaris, Linux etc.
- Long distance (120km) Asynchronous Remote Replication for DR
Issues and Requirements

• **Challenges**
  - Current Storage solution unable to keep up with increased demands
    - nightly Business Warehouse consolidation of distribution center data
    - online retail application YoY Growth
  - Insufficient visibility into storage health - difficult to diagnose performance issues and size latent demand
  - limited headcount – rising complexity – increased business requirements

• **Requirements**
  - Always On Infrastructure
  - Investment Protection and predictable cost for Hardware and Software purchases - future proof technology
  - All Flash strategy to mitigate performance bottlenecks and reduce complexity
The solution: Hitachi VSP G1000
All Flash Array with Universal Replicator

128 x 8/16Gbps SAN Ports

370 TB Capacity – 134 * 3.2TB Hitachi Flash Modules

Purpose built and optimized for Flash
VSP G1000 Hyper scale-up architecture

Single Image Scalability

2 TB Shared Dynamic Random Access Memory Cache

Future Proof Technology - predictable cost defined for 1.6PB Capacity

Future Flash technologies will be easily integrated into the Storage virtualization OS e.g. 3D NAND, TLC, denser Flash Modules, offload engines for data reduction etc.
Asynchronous – no distance limitations
- CPU Offload - reduced cost by replacing host based replication
- Supports virtually any platform, operating system and application
- No Host Impact on Response Times
- Data Movement Overhead on Out-Of Region Array (Pull Technology)
- Journaling maintains update sequence Integrity
- RPO measured in seconds, RTO in minutes (application dependent)
Hitachi Data Systems IOportal Cloud Service - EoU

- Dashboard
  - KPIs
  - Management View
  - Mobile Devices

- Capacity
  - Aggregation on Site, Storage System and Pool
  - Tier mixing Ratio
  - Detailed Cluster (Server) Reports

- Performance
  - Server Workload
  - Storage System Performance
  - Worktime
Production IO workload

HDS VSP G1000 S/N 58270 (exp 1lbs) Top 10 Port timeseries performance for entire storage system. The entire storage system has 44 connected ports.

Average interval 300 sec, UTC offset 0 sec. Graph created by user Henry_Schmidt on Mon 30 Jul 2015 14:14:06

I/O Response Time

SvCT (ms) | Low @ 2 ms | Medium @ 10 ms | High
--- | --- | --- | ---
0 | 2 | 4 | 8
Top 10 Servers

ESX Server is ranked 3 for IOPS, ranked 7 for Throughput
ESX Server KPI's

HUR async Replication > 120km
Average Response Time < 1ms
Many More Metrics are available e.g. MP Busy and Remote Replication

Utilisation of 64 MP’s

> 1GB/sec Write data Replication Throughput
Proactive performance management leads into capacity management and problem avoidance.
All Flash Array with Enterprise Class Functionality and High Availability

- Array based asynchronous replication for any Server, OS and application, removes the need for Host Software and server cycles and therefore reduces SW and HW cost
- Average Response Times well below 1 millisecond (ms) for entire storage subsystem
- Daily sequential throughput peak > 6GB/second

The need for Millions of IOPS – Myth or Reality?

- Even in a highly consolidated environment with a variety of OS (AIX, VMware, Linux, Solaris) and a diversity of applications (BI, ERP, Analytics), average I/O Rate observed is around 50,000 I/O’s per second, with peaks of 120,000 IOPS
- Blocksize is massively increasing, average Blksize is 40kB and up to 80kB for reads
- Most important is the very consistent low response times – High IOPS rating indicates subsystem scalability without impact to low latency performance

Need storage subsystem performance metrics for deep insights

- The right Metrics and instrumentation help deliver Quality of Service – Visibility!

Summary and key findings
Customer Benefits

- New subsystem coped with substantial latent demand
  - Eliminated hours of Elapsed Time for critical applications
  - Reduced Response Time by factor of 10
- Impact on Web Shop application
  - Faster shopping cart checkout time
  - Improved Online customer satisfaction
- Impact on Coop Business Warehouse
  - daily consolidation of distribution centre data now completes in time
  - Can do a lot more analytics runs, allows better planning and decision making, with SAP/HANA can do realtime stock adjustment planning

End User Quote: Habt Ihr über das Wochenende SAP "frisiert"? Geht alles viel schneller…konnte nicht mal mehr ins Kaffee…Die Auswertungen wahren schon auf dem Bildschirm bevor ich aufstehen konnte…
VSP G1000 AFA performance leadership
Storage Performance Council (SPC)

SPC1
#1

VSP G1000
OLTP Workload
Highly Random
Highly Parallel
High IOPS / Low Latency

2,004,941 IOPS @ 0.96ms Response Time

SPC2
#2

VSP G1000
DSS Workload
Highly Sequential
Highly Parallel
High Throughput

43,012 MB/s