

SAP HANA Platform in the Data Centre

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Disclaimer

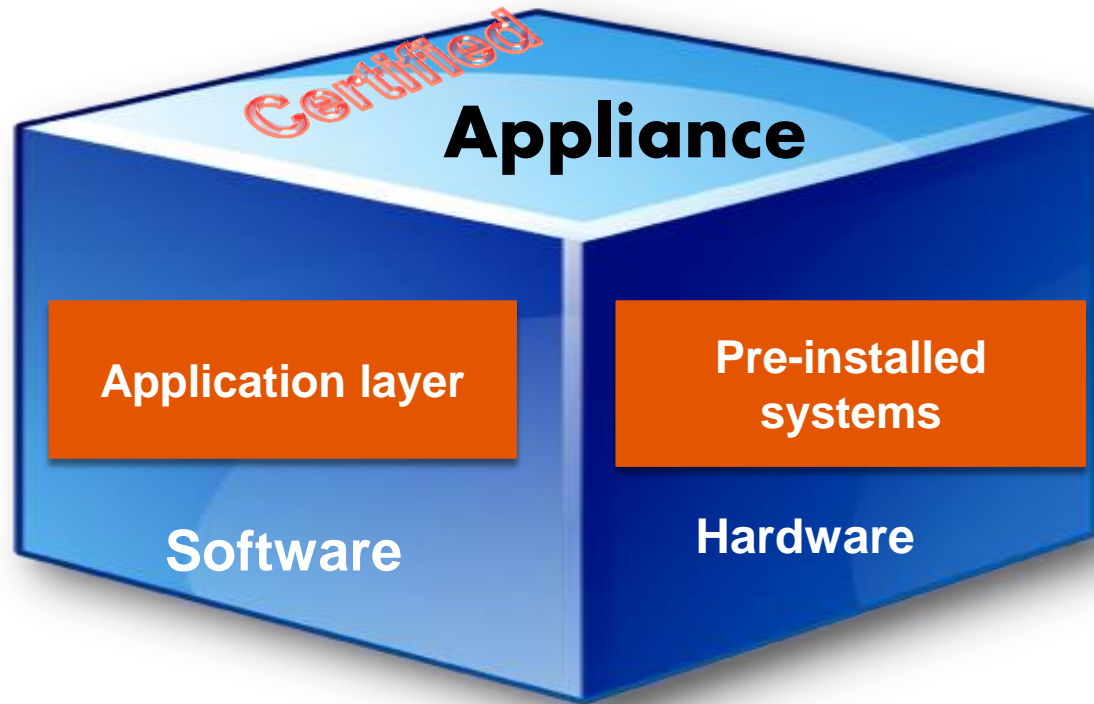
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Agenda

- SAP HANA Appliance & Platform Overview
- S/4 HANA & BW on HANA Overview.
- S/4 HANA & BW on HANA Sizing.
- SAP HANA in the Data Centre

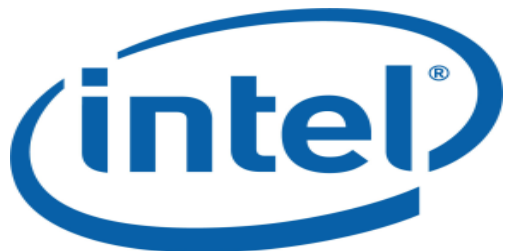
SAP HANA Appliance



SAP HANA Hardware Partners



SAP HANA Technology Partners

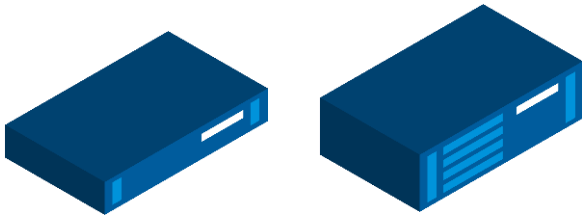


SAP HANA scalability

Scales from very small servers to very large clusters

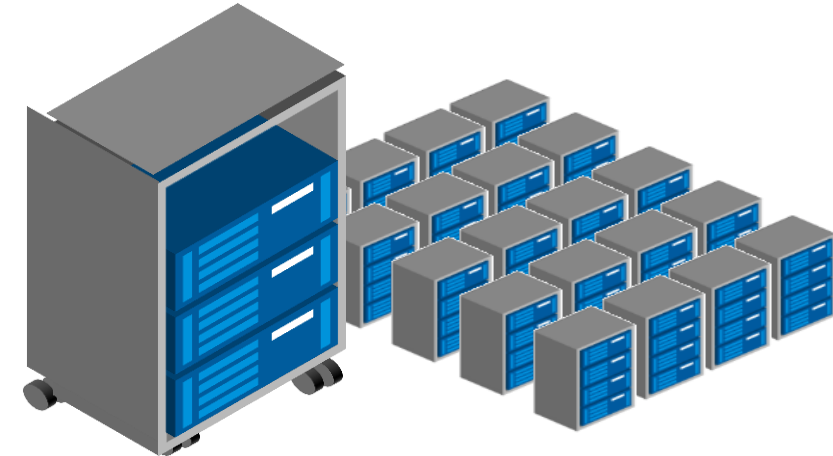


- SAP PAM / SCN is updated with the certified configuration based on Intel Ivy Bridge 15 Core CPU



Single Node

- 128GB – 6TB from all partners
- 12TB recently certified.



Scale Out Cluster

- For > 12TB



S/4 HANA Sizing Guideline

- ❑ Running the ABAP Script on current production system.
- ❑ Sizing Formula based on the actual Database size in production.
- ❑ Application Tier Sizing.



SAP HANA Enterprise Readiness

- ❑ Tailored Data Center Integration
- ❑ Systems Deployment Options - MTDC
- ❑ Backup / Recovery
- ❑ HA & DR Solutions
- ❑ Virtualization with VMware
- ❑ System Monitoring

SAP HANA tailored data center integration

Differentiating Capabilities



SAP HANA appliance delivery

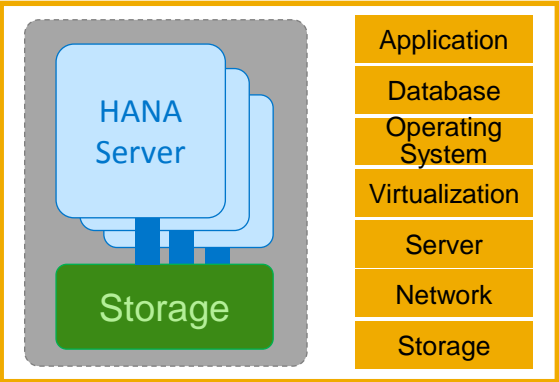
Fast Implementation

Support fully provided by SAP

SAP HANA tailored data center integration

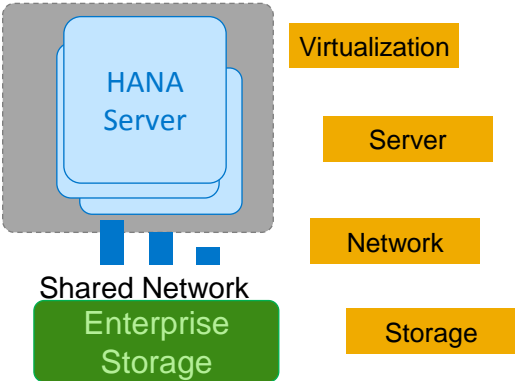
More Flexibility and Responsibility

Save IT budget and existing investment



- Solution validation done by SAP and partner
- Preconfigured hardware set-up
- Preinstalled software

- Installation and validation needs to be done by customer
- Customer aligns with the hardware partner on individual support model
- **Certified Storage Arrays only.**





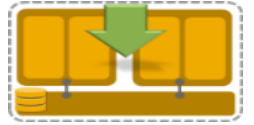
SAP HANA Enterprise Readiness

Systems Deployment Options

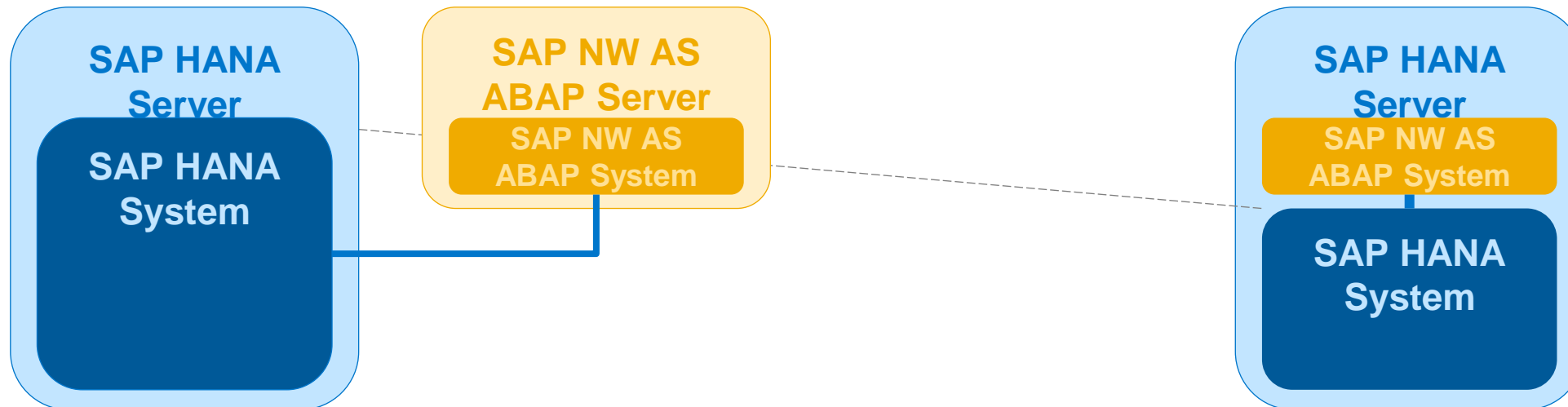
- Joined with SAP NetWeaver Application Server.
- Relaxed Configuration for HANA Non–Production.
- MTDC

Joined SAP HANA and SAP NetWeaver

ABAP Application Server and HANA Database on one hardware



SAP HANA and SAP NetWeaver AS ABAP deployed on one server is a multi-component, resource and cost optimized deployment approach



Separated
deployment approach

SAP HANA and SAP NetWeaver AS
deployed on one server

- ✚ Hardware resources isolated
- Separate hardware

- ✚ Cost optimized approach
- Shared Memory and CPU resources

Relaxed HW Specifications for Non-Production



Notes:

- Hardware still from PAM or ICC
 - [SAP Product Availability Matrix](http://scn.sap.com/docs/DOC-52522) or <http://scn.sap.com/docs/DOC-52522>
- Non-prod: Sizing flexible
 - Instances can be combined
 - SoH layouts can be used for BW

Processor	Intel Xeon E7 Westmere Ex (E7-x8xx v1) or Ivy Bridge EX (E7-x8xx V2)
Memory	Intel Xenon E5 - (E5-26xx v2/v3, min. 8 cores); 2 socket, up to 1.5TB; scale-up only 128 GB of RAM to Maximum memory supported on the box
Storage	Size: 2x Memory - Any local storage or shared storage w/ standard disk on proven file systems GPFS (IBM only), NFS or XFS w/ Raid 0 and above
Network	Standard networking components
Operating System	SUSE Linux 11.x or Red Hat 6.5 Virtualized or Bare Metal

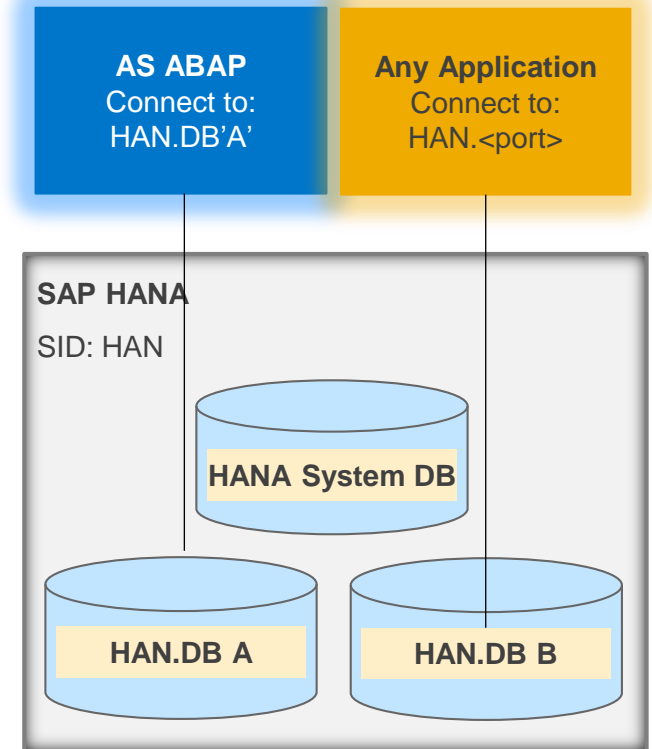
SAP HANA Multitenant Database Containers

Overview



SAP HANA multi-tenant database containers (MDC)

- Support for multiple tenant containers within a single system database
- Address common MCOD scenarios (e.g. ERP-CRM-BW, QA/DEV)
- Additive sizing for all tenant database
- Tenants memory sizing and CPU consumption can be configured independently
- Clear separation of application data and user management
- One HA/DR setting for a SAP HANA system: all tenants are included in a HA/DR scenario



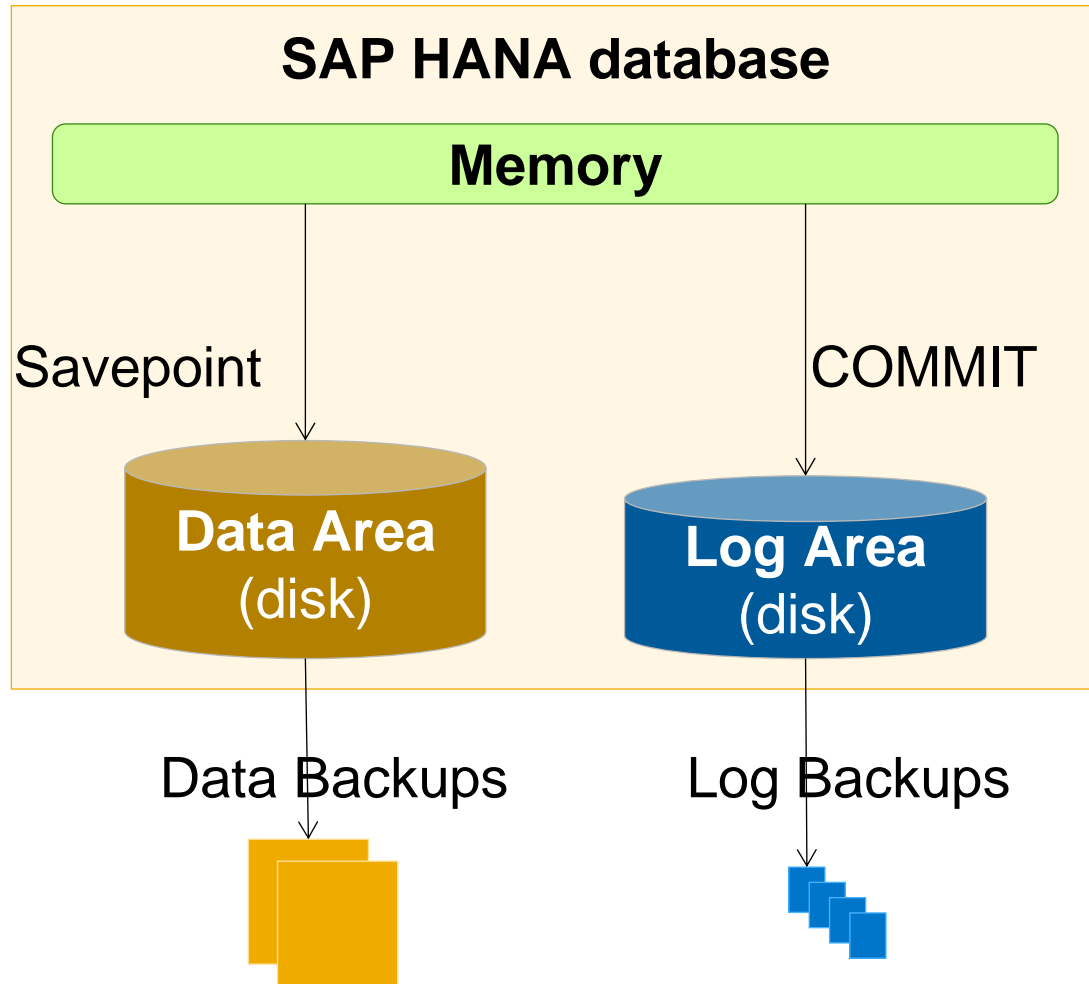


SAP HANA Enterprise Readiness

□ Backup / Recovery

SAP HANA Backup and Recovery

Memory → Disk → Backup



Data & Logs Backup

- SAP HANA studio
- SQL commands
- DBA Cockpit
- Certified Third party tools
- Storage Array Snapshot through HANA Studio

SAP HANA Backup

Backup in SAP HANA Studio



SAP HANA Administration Console - SAP HANA Studio

File Edit Navigate Project Window Help

Quick Access Administration Console Resources

Systems

- prod
 - O20 (BOB) New production
 - Transport Management
 - Add System...
 - Add System Archive Link...
 - Add Additional User...
 - Administration
 - System Replication...
 - Open Security
 - Back Up...
 - Storage Snapshot...
 - Recover...
 - Lifecycle Management
 - Open Memory Overview
 - Open Resource Utilization
 - test
 - Start...
 - Stop...
 - Restart...
 - Delete Delete
 - Refresh F5
 - Log Off
 - SQL Console
 - Find Table
 - Properties Alt+Enter

Backup of System O20

Specify Backup Settings

Specify the information required for the data backup
Estimated backup size: 860,23 MB.

Backup Type

Destination Type

Backup Destination

The default destination is used unless you specify a different destination. If you specify a new destination, ensure that the directory already exists. For improved data safety, it is recommended to specify an external backup destination.

Backup Destination

Backup Prefix

Backup Progress Information

Backup is running - 3 of 4 services finished successfully

lu252616		
Statistics Server	<div><div></div></div>	100.0%
	Execute Data Backup Finished	
XSEngine	<div><div></div></div>	100.0%
	Execute Data Backup Finished	
Index Server	<div><div></div></div>	0.0%
	Execute Data Backup In Progress	
Name Server	<div><div></div></div>	100.0%
	Execute Data Backup Finished	

SAP HANA Backup and Recovery

Third Party Tools Certification



Vendor	Certified Backup Tool	Support Process
Symantec	NetBackup 7.5	SAP Note 1913568
IBM	Tivoli Storage Manager for Enterprise 6.4	SAP Note 1913500
Commvault	Simpana 10.0	SAP Note 1957450
HP	Data Protector 8.0	SAP Note 1970558
EMC	Data Domain	SAP Note 1970559
EMC	Networker 8.2	SAP Note 1999166
SEP	Sesam 4.4	SAP Note 2024234

SAP HANA Backup and Recovery

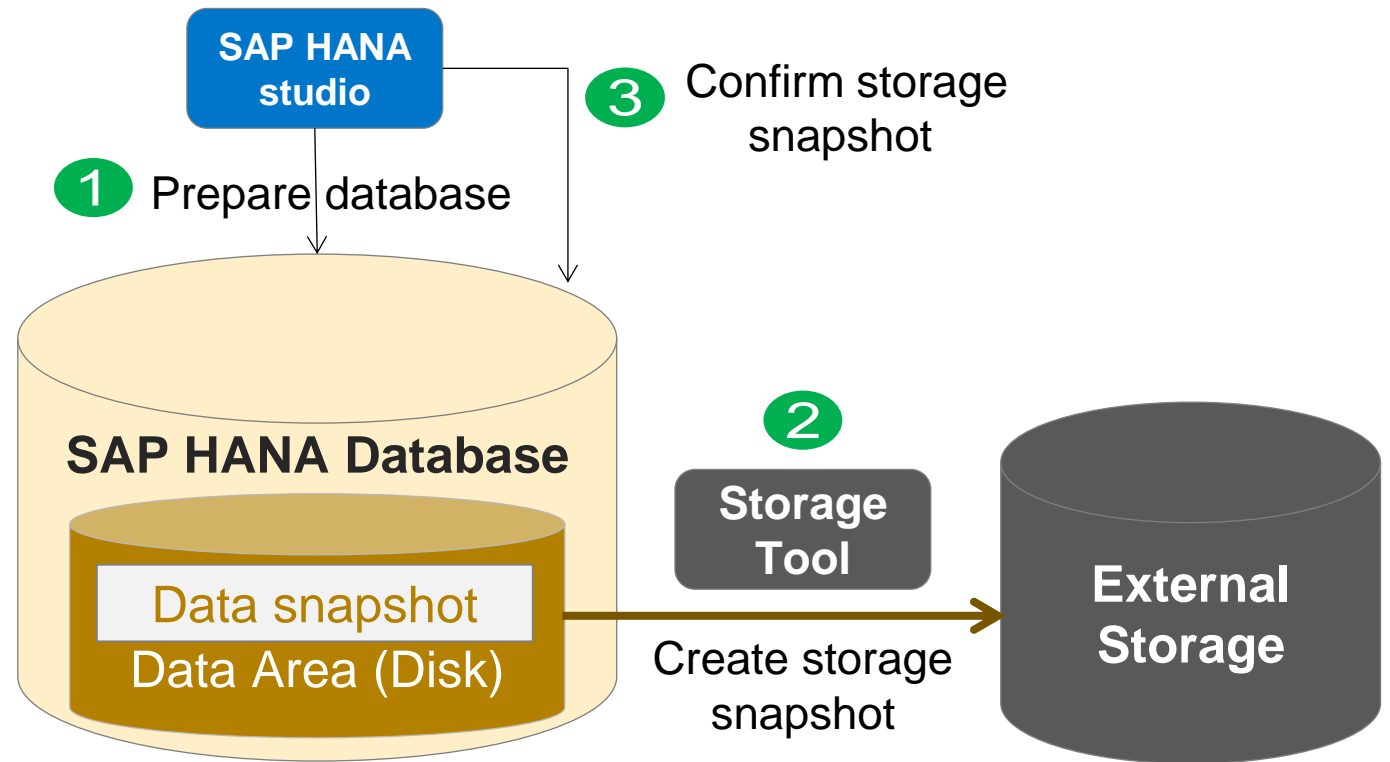
Destinations for backups



Storage snapshots as backups

SAP HANA also supports the creation of storage snapshots, which can later be used for recovery

1. Using SAP HANA studio, prepare the database for the storage snapshot. Technically, this creates an internal data snapshot
2. Using the storage tool, create a storage snapshot of the SAP HANA data area
3. In SAP HANA studio, confirm the storage snapshot as successful. An entry including the external backup ID is written to the backup catalog

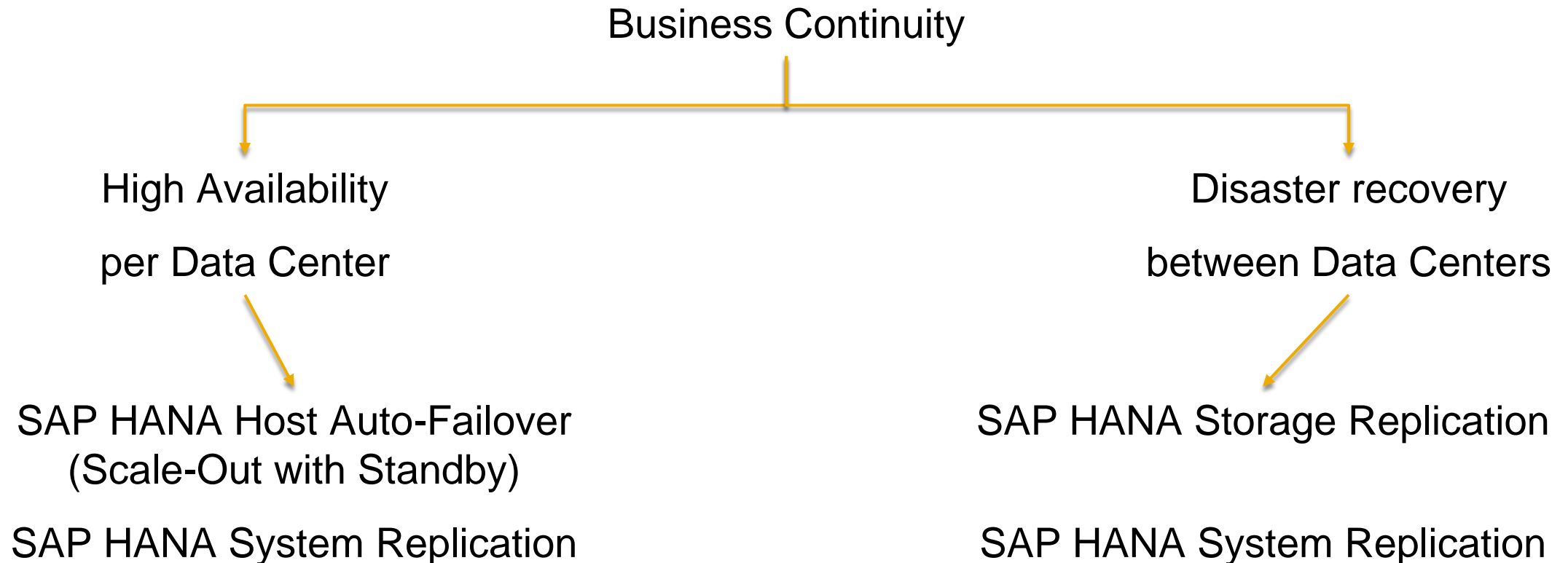
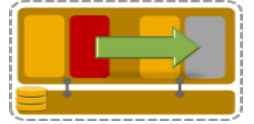




SAP HANA Enterprise Readiness

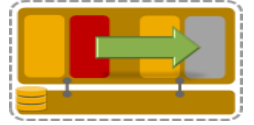
□ HA & DR Solutions

High Availability – Disaster Recovery



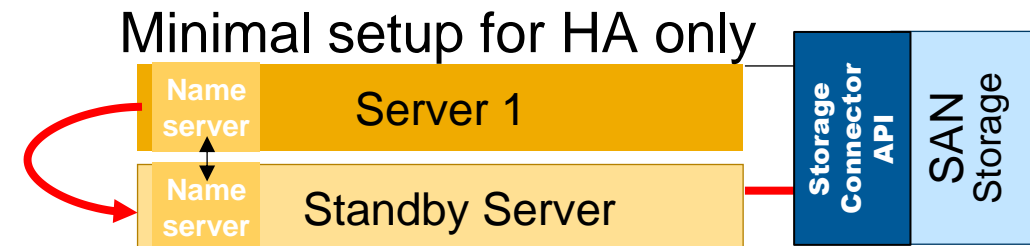
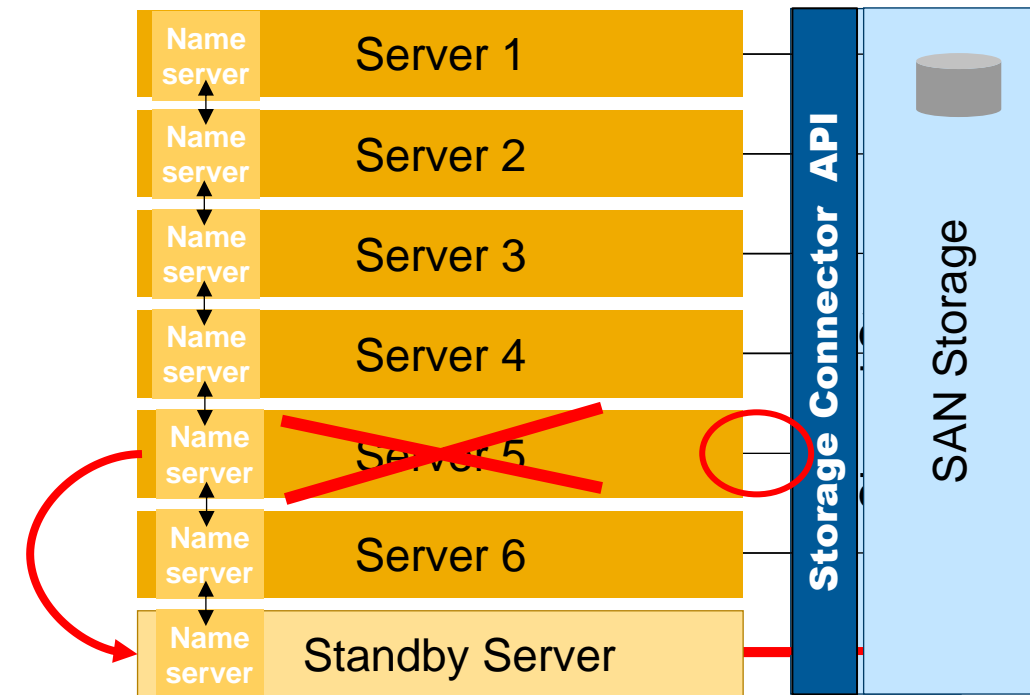
SAP HANA High Availability

Scale-Out with Host Auto-Failover



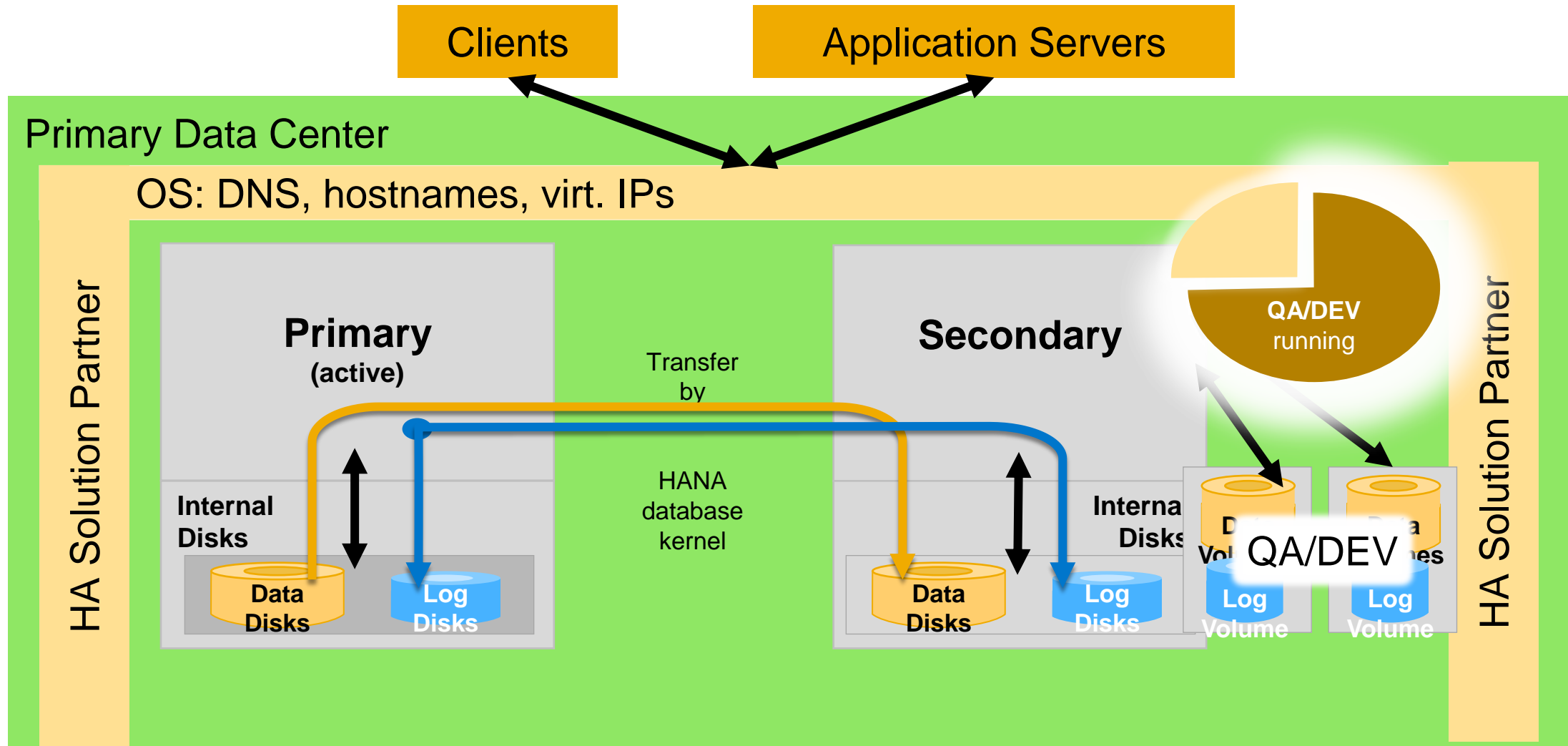
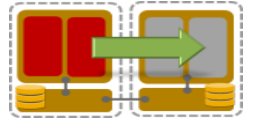
Host Auto-Failover

- The resulting cluster is managed by HANA Services.
- Regularly checks on the cluster members status
- In case one active node goes down, initiates a fully automated take-over to the standby hardware.
- Storage Connector API ensures the possibility of remounting necessary file systems to standby hosts



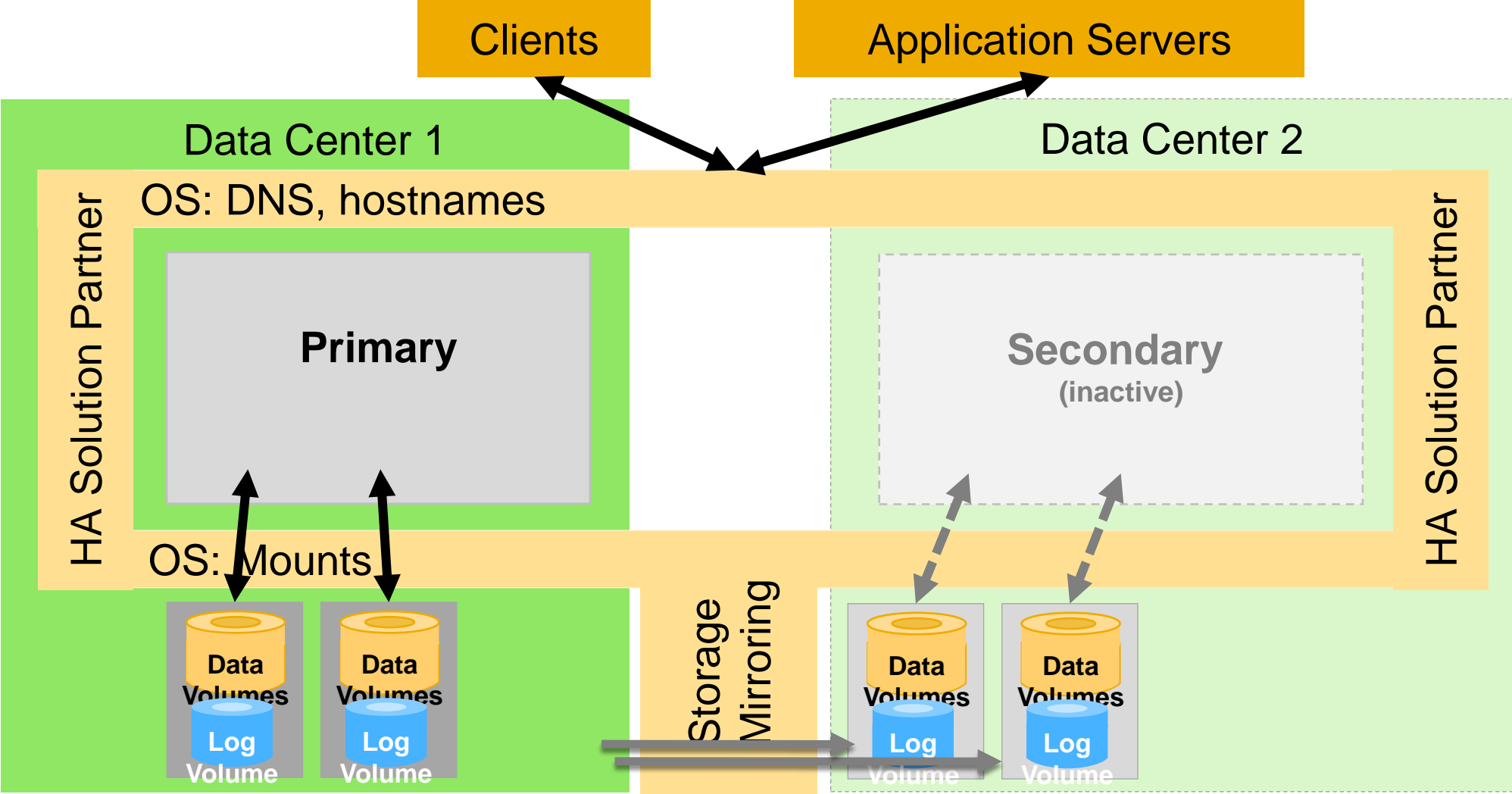
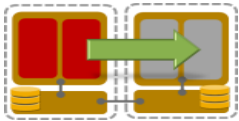
SAP HANA Local Datacenter HA With System Replication

LOCAL Data Center for fast takeovers. Dev & Q/A can run on Secondary



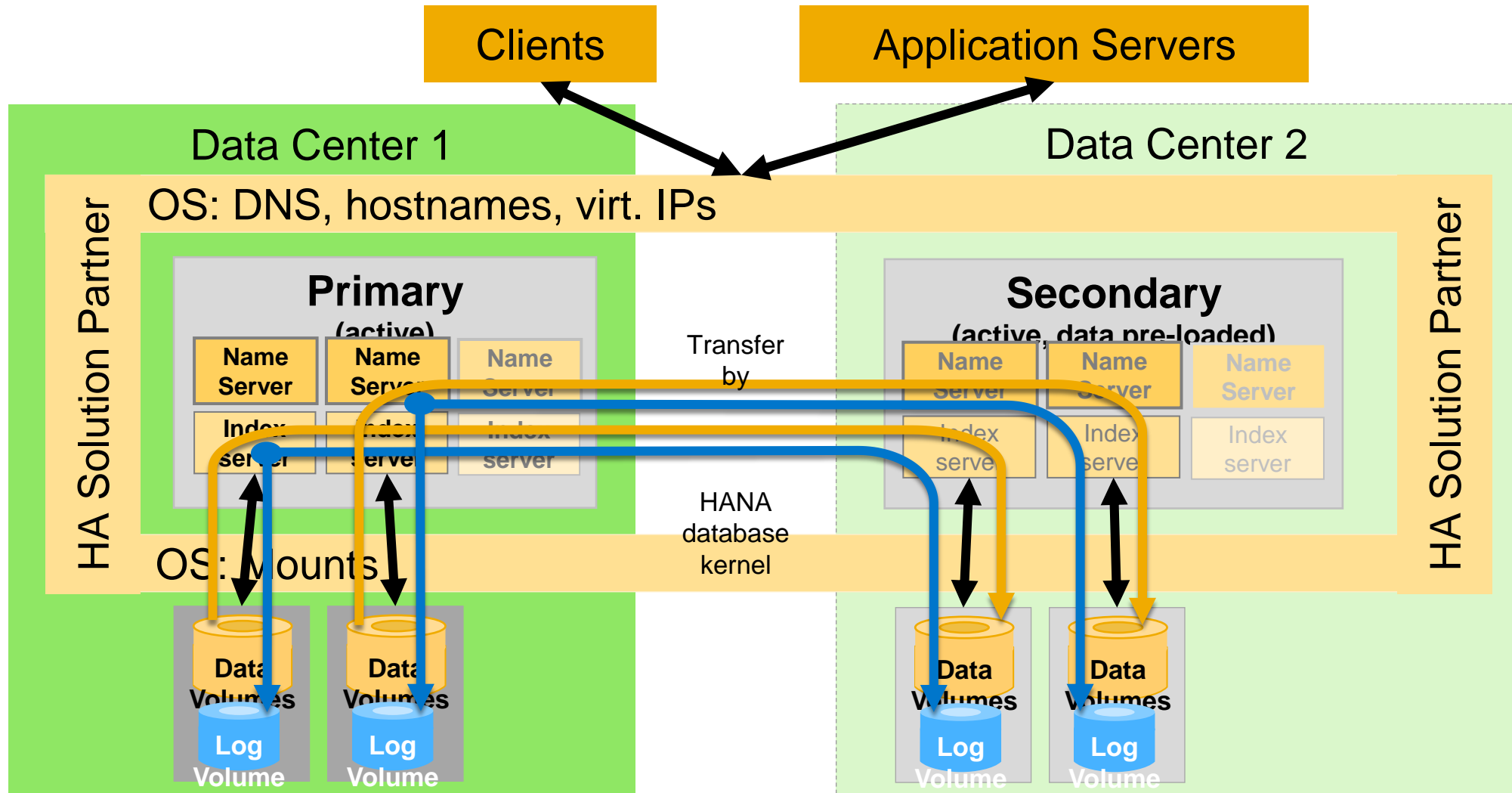
SAP HANA Disaster Recovery: Storage Replication

Cluster across Data Centers



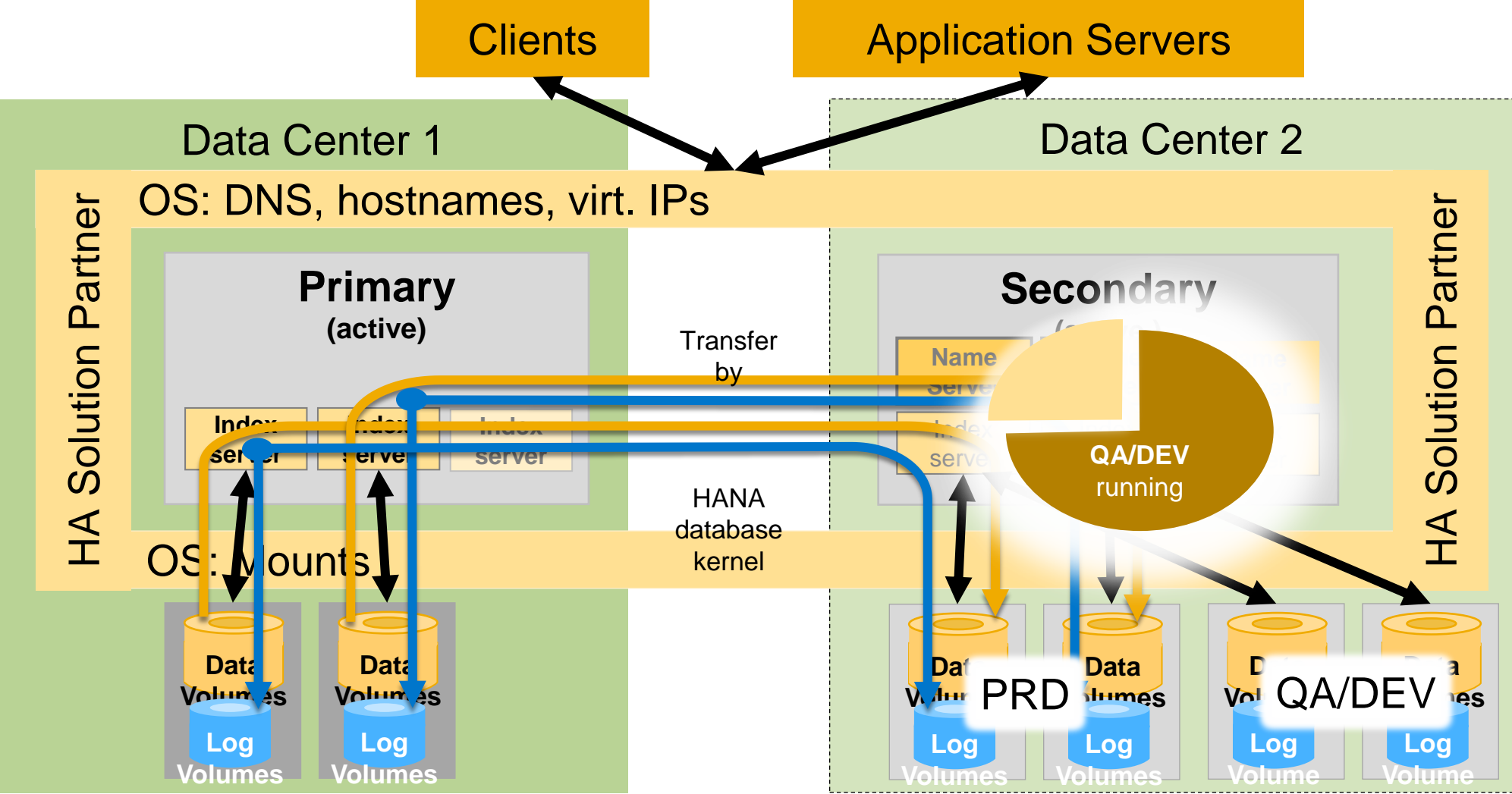
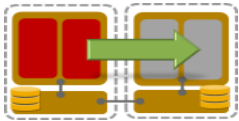
SAP HANA Disaster Recovery With System Replication

Cluster across Data Centers with DB controlled transfer



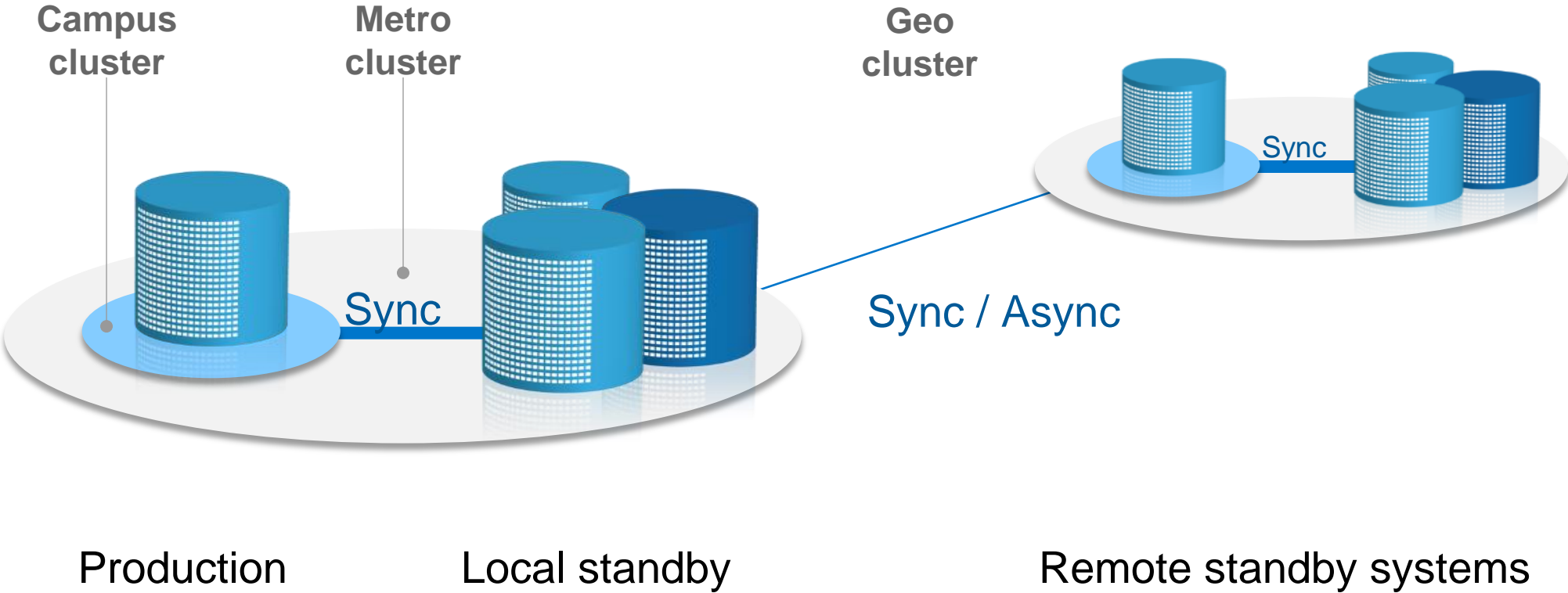
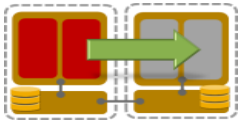
SAP HANA Disaster Recovery: System Replication

Cluster across Data Centers with QA & Dev on 2nd site



Worldwide Data Center Setups

Multi Tier System Replication – Cascading Systems



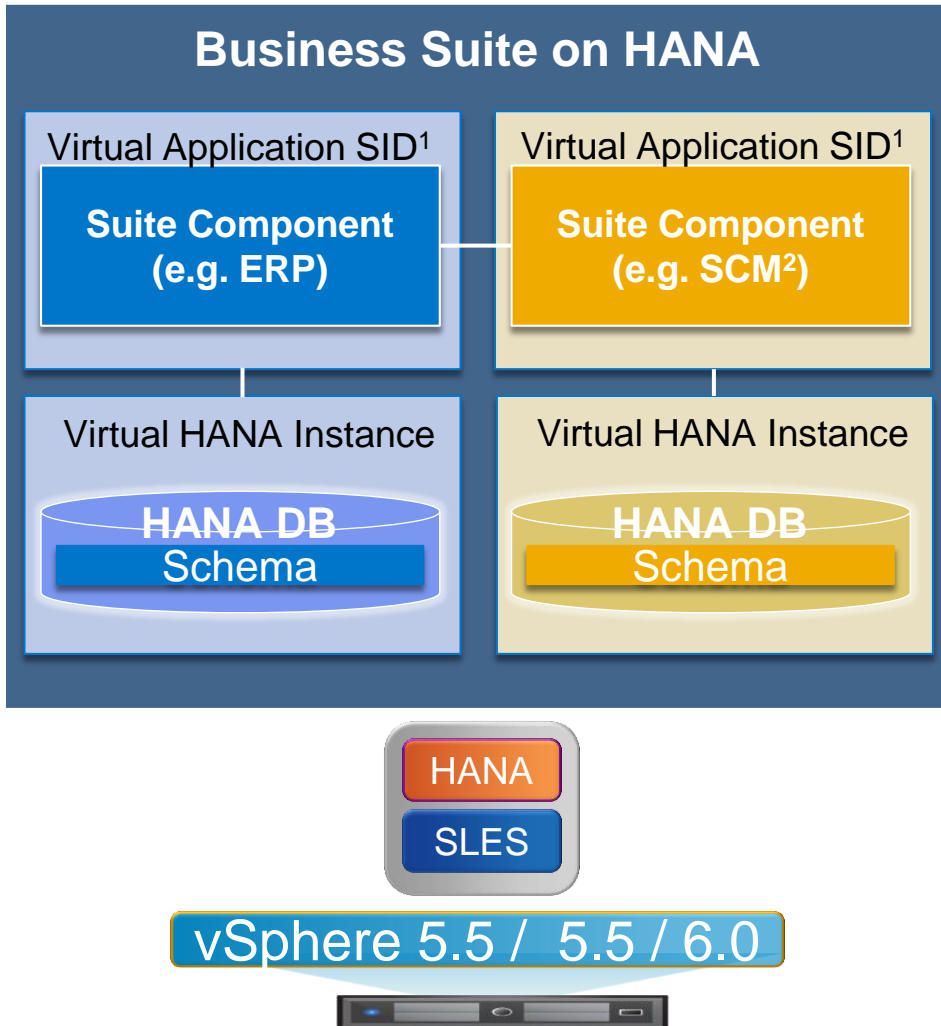


SAP HANA Enterprise Readiness

- ❑ Virtualization with VMware

SAP HANA System Deployment Option

Virtualization with VMware



Virtualization

- Separate SAP HANA databases per SAP system
- Separate virtual machine and OS
- Multiple VMs on Non-Production
- Currently supported:
 - VMware vSphere 5.1 / 5.5 / 6.0
- Current restrictions:
 - Single-node SAP HANA databases up to 1 TB
 - Multiple VMs on one HANA Appliance for **Production**. (Controlled Availability)

SAP HANA on VMware – Performance Tests



CERTIFICATION

SAP® Standard Application Benchmarks

The SAP BW Enhanced Mixed Load (BW-EML) Standard Application Benchmark performed on May 14, 2014 by HP in Houston, TX, USA, with a total of 2,000,000,000 records, was certified by SAP on behalf of the SAP Benchmark Council on June 2, 2014, with the following data:

Throughput/hour (ad-hoc navigation steps): 111,850
Number of initial records: 2,000,000,000
CPU utilization of DB server: 95%
CPU utilization of Application Servers: 26% (App Server1: 26%, App Server2: 26%)
Operating system Database Server: Suse Linux Enterprise Server 11 on VMWARE ESX 5.5
Operating system Application Servers: Suse Linux Enterprise Server 11
RDBMS: SAP HANA 1.0
Technology platform release: SAP NetWeaver 7.30

Configuration:

No. of servers	Usage	Hardware	Segmentation / CPU utilization in virtual machines
1	DB	HP DL580 Gen8, 4 processors / 60 cores / 120 threads, Intel Xeon Processor E7-4880 v2, 2.50 GHz, 64 KB L1 cache and 256 KB L2 cache per core, 30 MB L3 cache per processor, 1024 GB main memory	1 virtual machine using 64 virtual CPUs VM1 (DB): 94%
1	Application Server (Dialog/ Update/ Message/ Enqueue)	HP BL680 G7, 4 processor / 40 cores / 80 threads, Intel Xeon Processor E7-4870, 2.40 GHz, 64 KB L1 cache and 256 KB L2 cache per core, 30 MB L3 cache per processor, 1024 GB main memory	Not applicable because not virtualized
1	Application Server (Dialog/ Update)	HP BL680 G7, 4 processor / 40 cores / 80 threads, Intel Xeon Processor E7-4870, 2.40 GHz, 64 KB L1 cache and 256 KB L2 cache per core, 30 MB L3 cache per processor, 512 GB main memory	Not applicable because not virtualized

<12% difference!



CERTIFICATION

SAP® Standard Application Benchmarks

The SAP BW Enhanced Mixed Load (BW-EML) Standard Application Benchmark performed on March 8, 2014, by HP in Houston, TX, USA, with a total of 2,000,000,000 records, was certified by SAP on behalf of the SAP Benchmark Council on March 26, 2014, with the following data:

Throughput/hour (ad-hoc navigation steps): 126,980
Number of initial records: 2,000,000,000
CPU utilization of database server: 93%
CPU utilization of application servers: 31% (App 1: 30%, App 2: 31%)
Operating system, all servers: SuSE Linux Enterprise Server 11
RDBMS: SAP HANA 1.0
Technology platform release: SAP NetWeaver 7.30

Configuration:

1 Database server: HP DL580 Gen8, 4 processors / 60 cores / 120 threads, Intel Xeon Processor E7-4880 v2, 2.50 GHz, 64 KB L1 cache and 256 KB L2 cache per core, 30 MB L3 cache per processor, 1024 GB main memory

2 Application Servers: (Dialog/ Update/ Message/ Enqueue) HP BL680 G7, 4 processor / 40 cores / 80 threads, Intel Xeon Processor E7-4870, 2.40 GHz, 64 KB L1 cache and 256 KB L2 cache per core, 30 MB L3 cache per processor, 1024 GB main memory



SAP HANA Enterprise Readiness

- ❑ System Management & Monitoring

SAP HANA Administration and Monitoring

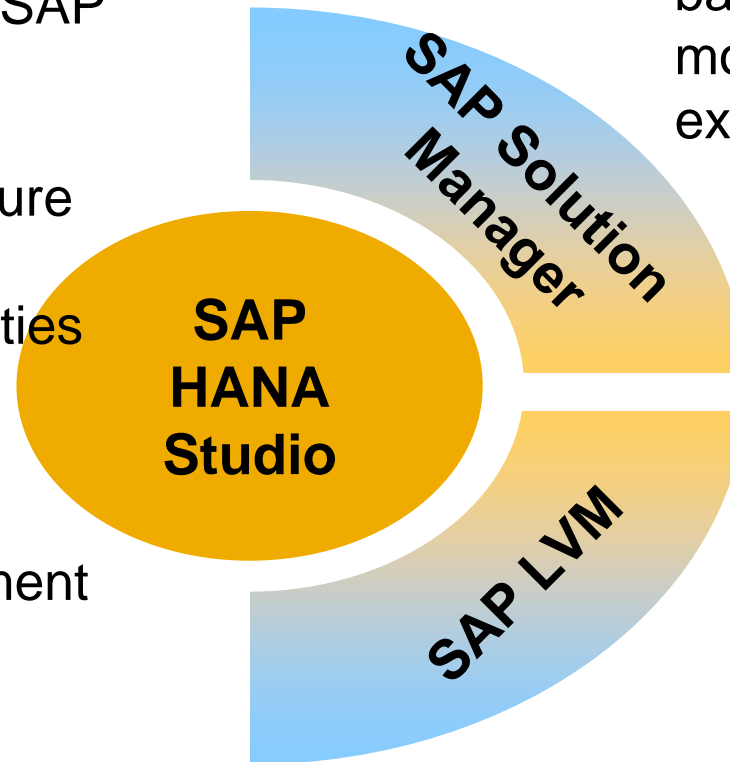
Introduction



HANA Studio is one administration & monitoring tool for managing SAP HANA

It enables customers to make sure their HANA system runs as expected and provides possibilities to analyze problems

It also houses the SAP HANA modeler and the user management for the SAP HANA database



SAP Solution Manager can be used for basic administration and holistic monitoring of HANA systems within existing SAP landscapes.

It is used by SAP support for early problem analysis and as backbone for CTS+ transport integration.

SAP HANA also integrates with **SAP Landscape and Virtualization Manager (LVM)** for basic operation of larger/more complex SAP landscapes (start/stop & dependencies, etc.)

SAP HANA Studio

Native Administration & Monitoring Console



Administration Console - System: HA5 Host: hanad5.vdf.sap.corp Instance: 01 Connected user: SYSTEM - SAP HANA Studio

File Edit Navigate Window Help

Navigator

- HA5 (SYSTEM) HA5
 - Catalog
 - Authorization
 - Public Synonyms
 - D003411
 - D027081
 - DS5CLNT005
 - HA5 (SYSTEM) HA5
 - SYSPRO
 - NTSR
 - SYSTEM
 - SYS_REPL
 - VW
 - _SYS_BI
 - _SYS_BIC
 - _SYS_REPO
 - _SYS_STATISTICS

Administration View

HA5 (SYSTEM) HA5 Last update: 30.07.2011 00:13:52 Interval: 60 seconds

Overview Landscape Alerts Performance Volumes Configuration System Information Diagnosis Files

General System Information

Operational State: ☒ All Services are started

Start Time of First Started Service: 06.07.2011 10:17:24

Start Time of Latest Started Service: 29.07.2011 06:46:50

Distributed System: No

Version: 1.00.12.351658 (NewDB100_REL)

Build Time: 2011-07-01 20:35:10

Platform: SUSE Linux Enterprise Server 11.1

Physical Memory

Memory Available (GB): 47,13

Memory Used/Available (GB): 13,94 / 47,13

Data

Size of Disk Containing Data Files (GB): 400,26

Disk Space Used/Available (GB): 141,83 / 400,26

Current Alerts

1 alert with HIGH priority

[Show alerts](#)

Properties View

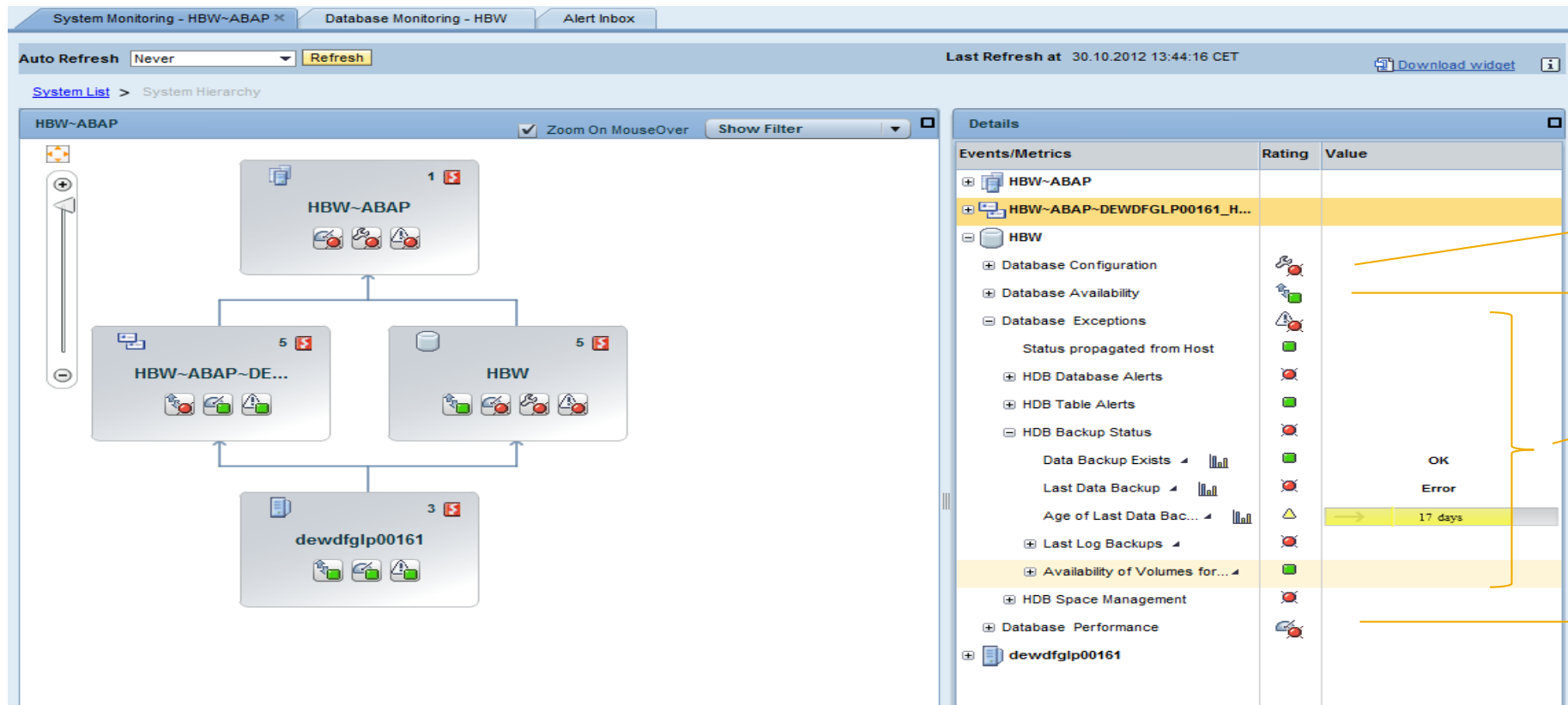
HA5 (SYSTEM)

Property	Value
Connection Properties	
Driver	com.sap.db.jdbc.Driver
Driver Path	C:\Users\jdo47075\.eclipse\org.eclipse.platform_3.5.0_511115836\configuration...

Solution Manager – System Monitoring



Database metrics in Solution Manager reflect all Alerts from HANA Studio / DBA Cockpit
View on complete Stack



Configuration Alerts

Availability Alerts (by Hostagent)

Special HANA Alerts

- General Exceptions
- Table Exceptions

HANA Performance Alerts

- Memory Usage
- CPU Usage



Thank you

Q / A