





# **Reading Sample**

This sample chapter describes the infrastructure requirements to prepare your system landscape for the SAP Business Suite on SAP HANA migration. It covers multiple methods for ensuring your environment is sized properly, and demonstrates some of the backup and recovery options available to you.



#### Michael Pytel

# Implementing SAP Business Suite on SAP HANA

597 Pages, 2016, \$79.95/€79.95 ISBN 978-1-4932-1257-6



© 2016 by Rheinwerk Publishing, Inc. This reading sample may be distributed free of charge. In no way must the file be altered, or individual pages be removed. The use for any commercial purpose other than promoting the book is strictly prohibited.

Running SAP Business Suite on SAP HANA requires infrastructure changes to your SAP landscape because new software components and hardware are installed within your landscape. In addition to ensuring that it's sized appropriately, you need to ensure that it's all backed up and recoverable.

# 3 Infrastructure Planning

Now that we've defined the project scope, you can focus on the decisions you'll need to make about your infrastructure planning. For those customers whose SAP systems began as SAP NetWeaver 7.31 or above, minimal changes are required. For those customers whose SAP ERP systems were initially installed with SAP R/3 or SAP ERP 6.0 on SAP NetWeaver 7.0 and then upgraded over the years, you'll have some more decisions to make. You'll learn more about why SAP is recommending changes to the primary application server (PAS) and how to comply with those recommendations. What is an enqueue server, and why does SAP want it separate? We'll cover this topic and talk about how it affects sizing. Additionally, if you were a customer who installed a Java stack in addition to the ABAP stack during your initial deployment of SAP ERP 6.0, we'll highlight some of the changes required in your landscape before the migration to SAP Business Suite on SAP HANA. SAP doesn't support the migration of a dual stack system to SAP HANA. We'll cover the how and the why as it relates to your SAP Business Suite on SAP HANA migration.

Sizing your SAP Business Suite on SAP HANA environment will depend on the scope you identified in Chapter 2 and the architecture your team plans to deploy. In Chapter 1, you learned about some of the architecture options when running SAP Business Suite on SAP HANA, which we'll expand upon in this chapter by explaining how each architecture option impacts your sizing requirement. SAP supports running the ABAP PAS on the same hardware as the SAP HANA database, which was previously not an option. We'll break down the additive sizing requirements and discuss the potential benefits of this landscape to those customers with small- to medium-sized environments.

[**«**]

In addition to sizing, we'll also explore some of the backup and recovery options available to SAP customers. There are numerous hardware vendor-provided solutions in addition to the capabilities provided by SAP. We'll show you how to find those certified solutions and provide more details on out-of-the-box solutions. This chapter concludes with information on backup and recovery to support the best decision for your organization's landscape.

### 3.1 Enqueue Server

The enqueue server is the function within SAP NetWeaver that maintains data about user locks in the lock table in memory; it keeps users operating day to day in SAP ERP without interrupting other users. When a user opens a purchase order, and the message is displayed that another user has the document locked, this is one function the enqueue server supports. Beginning with SAP NetWeaver 7.31 and continuing in SAP NetWeaver 7.4, SAP began splitting the enqueue services from the central instance by default. This means that new installations you delivered had two instances on the PAS host. One instance supports the ABAP dispatcher, work processes, gateway, Internet Communication Manager (ICM), and Internet Graphics Service (IGS), and the other instance supports the message server and enqueue server. If your system was originally an SAP R/3 system, or the initial install was done using a release prior to SAP NetWeaver 7.31, then all these functions were part of a single instance. There are, of course, exceptions. If your SAP ERP landscape was configured for High Availability (HA), it's likely you already have a standalone enqueue server that is replicated to another host for failover purposes. If you're already using the HA scenario with SAP NetWeaver 7.x, then no action is needed with the enqueue server. If you're a customer with the integrated enqueue server on any version of SAP NetWeaver, then SAP recommends that you split the function from the central instance before the migration to SAP HANA. SAP specifically says:

SAP strongly recommends using the standalone enqueue server as the better solution. The standalone enqueue server offers better performance and better scalability for large systems (two or more dialog instances). It is already the standard for all new installations and mandatory for high availability setups. In future releases, it will become mandatory for all systems.

#### Note

If you want to read SAP's official statement in full, see SAP Note 2019532 – Performance of Integrated Enqueue Server, and SAP Note 2013043 – Performance Problems with Enqueue Work Process.

SAP does provide the tools you need to initially split the enqueue server from the central instance. Using the Software Provisioning Manager 1.0 (SWPM), you can split the instance with minimal application server downtime. Ideally, this is done in the weeks or months before the SAP Business Suite on SAP HANA migration. It's a relatively low-risk activity because you're not moving services to another server. You're keeping the services local but splitting them from the primary instance for performance reasons. In Figure 3.1, you can visualize the changes being made to your system. The update also requires edits to the instance profile for the application servers.



Figure 3.1 ABAP SAP Central Services Instance

Follow these instruction to split the enqueue server from the central instance:1. Using the SWPM, launch the application on the PAS.

2. In the directory tree, choose <YOUR SAP NETWEAVER RELEASE> • <YOUR DATA-BASE> • ADDITIONAL SAP SYSTEM INSTANCES • SPLIT OFF ASCS INSTANCE FROM EXISTING PRIMARY APPLICATION SERVER INSTANCE (see Figure 3.2).



Figure 3.2 Guided Procedure to Split Off the ABAP SAP Central Services Instance

- 3. Choose TYPICAL as the PARAMETER MODE when prompted.
- 4. Enter the path to the SAP system profiles in the PROFILE DIRECTORY field shown in Figure 3.3, and click NEXT.
- 5. Input the DATABASE ID (DBSID) and the DATABASE HOST, and click NEXT.

Choose Option	2 Define Parameters	3 Summary	4 Execute	5 Completed
ieneral SAP Syst	em Parameters			
nter the profile directory	of the SAP system.			
AP System Identificatio	n			
rofile Directory /usr/sa	ap/N74/SYS/profile			
dditional Information	etrieved from the SAP system (	profile directory. The loca	tion of your SAP system pr	ofile directory is as follows:
xisting parameters are n				
2.	GLOBALHOST>\sapmnt\ <sapsi< td=""><td>D&gt;\SYS\profile</td><td></td><td></td></sapsi<>	D>\SYS\profile		

Figure 3.3 Reading the Profiles to Validate the Process

6. Define the path to the kernel media (which can be downloaded from the SAP Support Portal at *http://support.sap.com/swdc*), as shown in Figure 3.4.

<u>File</u> SAP <u>i</u> nst <u>H</u> elp				
Software Provisi	oning			SAP
Choose Option	2 Define Parameters	3 Summary	4 Execute	5 Completed
Media Browser				
Software Package Request				
Medium UC Kernel NW740 SR2		Package L	ocation.	Browse
Additional Information The required software packa If there is a complete mediur the Package Location column	n available on the installatio			ASC or LABELIDX.ASC.

Figure 3.4 Entering the File Path for the Kernel Media

- 7. The ports for the ABAP message server are read automatically. Validate, and click NEXT.
- 8. On the SUMMARY step, verify all input. Clicking SHOW DETAIL will give you all parameters used. Then click NEXT, as shown in Figure 3.5.

Software Provisi	oning		SAP
Choose Option     Parameter summa     Choose 'Next' to start with th     the screen where you can cha	e values shown. Otherwise,		
Parameter list Parameter Settings Parameter Mode Typical			
General SAP System P Profile Directory /usr/sap/N74/SYS			
SAP System Database Database ID (DBSID) N74 Database Host SAPN74SANDB0X Database on RAC			
ASCS Instance	e Show <u>D</u> etail		

Figure 3.5 Summary of All Parameters

- 9. The installer processes the information. During this time, the application server instances are restarted with new parameters.
- 10. When prompted, confirm the completion message.

[**》**] No

For information on the process of splitting the ASCS instance and additional settings, see SAP Note 2119669 – How to Split the ASCS from Primary Application Server (PAS).

### 3.2 Dual Stack Split

SAP no longer supports the update of dual stack systems with the SAP Business Suite. Dual stack systems are defined as a single SAP instance with both an ABAP AS and a Java AS sharing a single system ID and database. This increases maintenance of the system and decreases system performance. Fortunately, SAP provides the SWPM as part of the software logistics toolset (SL Toolset). This program provides a menu-driven wizard tool to export the Java stack, install a new Java stack, and then uninstall the Java stack from the ABAP system. Several options are available to you in terms of where the new Java instance resides. You can install the new Java instance on the same host(s) as the ABAP instance, or use this opportunity to dedicate a host for the Java instance, as shown in Figure 3.6. This answer depends on your current Java instance usage and current hardware sizing. Installing the Java stack on the same host requires additional resources because the new instance will have its own set of binaries, database, and lifecycle.



Figure 3.6 Dual Stack Split Process Overview

It's worth noting that the Java stack split creates a completely separate Java instance with its own User Management Engine (UME). This means your SAP ERP (ABAP) users who previously could access the Java stack as part of SAP ERP will no longer have a user ID and password to the Java instance. However, the Java instance UME can be reconfigured to use the ABAP system as the UME, meaning

that the Java stack user management database can continue to reside within the ABAP stack.

#### [»] Note

For the latest information on the SL Toolset, which includes SWPM and the Software Update Manager (SUM), check out the SAP Service Marketplace at *http://service.sap.com/sltoolset*. This site is dedicated to release information, installation guides, how to start/stop SAPINST, and direct access to downloads.

#### **Executing Dual Stack Split**

To execute the dual stack split, follow these steps:

- 1. After downloading the latest SWPM from SAP Service Marketplace, log on to the PAS with an administrative account.
- 2. Start SAPINST, and navigate via the menu to DUAL-STACK SPLIT. The first task you'll execute is EXPORT JAVA STACK, as shown in Figure 3.7.



Figure 3.7 Initial Menu in Software Provisioning Manager

- 3. Select the menu item, and click NEXT.
- 4. When prompted, enter the path to the SAP PROFILE DIRECTORY, and click NEXT.
- 5. Enter the Password of SAP System Administrator when prompted, and click Next.
- 6. Select the correct DATABASE ID (DBSID), and click NEXT.
- 7. On the next screen, select the EXPORT LOCATION to store the Java export, and leave MANUALLY STOP SYSTEM checked, as shown in Figure 3.8. Typically, 10–20GB will suffice.

🕼 SAPinst D		sources have be one		4
<u>F</u> ile SAP <u>i</u> nst <u>H</u> elp				
Software Provi	sioning			5
·1	2	3	4	5
Choose Option	Define Parameters	Summary	Execute	Completed
SAP System > Da	tabase Export			
Enter the directory for the ex	port location			
Database Export				
Export Location*	\Java_export			Br
Manually Stop System 🕑				
If you select Manually Stop	xport Location during the install System and your system is run port for building a production sy	ning, you will be asked to n		
▲ Back Next ▶				

Figure 3.8 Choosing the Export Location

- 8. Select the option to let the SUM disable the Java stack using the profile parameter rdisp/j2ee\_start=0. This doesn't stop the system at this point, but it adds the required parameters to disable the Java stack from starting when you restart services. Check the DISABLE APPLICATION SERVER JAVA box, and then click NEXT.
- 9. On the PARAMETER SUMMARY screen (see Figure 3.9), review all parameters, and click NEXT to begin the export process. You'll need to manually stop SAP services when your team gives you permission.



Figure 3.9 Parameter Summary Screen in Software Update Manager

- 10. At this point, the Java export occurs and should not be restarted until you install the new Java instance.
- 11. When prompted, stop SAP services, and click OK (see Figure 3.10). Note you only need to stop Java services within the dual stack system using Transaction SMICM.
- 12. Click OK. The export process continues, and the application server downtime begins for the dual stack split.
- 13. Verify the results on screen when presented with the completion message (see Figure 3.11).
- 14. Restart the SAP services using the command Stop SAP, or use the Microsoft Management Console (MMC).

n -			ICM			0.00 00.0		
Ø			-			副船(約)		P . 4
			J2EE I	instance (local)	•	Send Soft	Shutdown	
IC	MM	onitor	J <u>2</u> EE (	Iuster (global)		Send <u>H</u> ard	Shutdown	- <b>- -</b>
ഞ്ഞം	<b>a</b> 6		Le	<u>W</u> ith Restart		End Proces	ss	· •
31		) 🖗 Releas		Without Resta	art	Restart		→ " "
			_	_		Display Sta	itu c	
ICM	[ Sta	tus:		Running	000			
Res	tart	After Error		true				
Tra	ice L	evel (0-3):		1				
Cre	ated	Worker Thre	ads:	10 / 21	/ 250	( Current /	Peak / Ma	aximum )
Con	mect:	ions Used:		0 / 23	/ 500	( Current /	Peak / Ma	aximum )
COL				0 / 40	/ 500	( ourreno )	,	,
	ue Ei	ntries Used:			/ 1000	( Current /		
	ue Ei	ntries Used:						
				0 / 4		( Current /	Peak / Ma	
		ntries Used: Thread ID					Peak / Ma	
			Number	0 / 4		( Current /	Peak / Ma Request	
	No.	Thread ID	Number 6,204	0 / 4 Status		( Current / Processed	Peak / Ma Request	
	No.	Thread ID 1397521833	Number 6,204 6,211	0 / 4 Status Running		( Current / Processed	Peak / Ma Request	
	No. 1 2	Thread ID 1397521833 1397521828	Number 6,204 6,211 6,202	0 / 4 Status Running Available		( Current / Processed	Peak / Ma Request	
	No. 1 2 3	Thread ID 1397521833 1397521828 1397521823	Number 6,204 6,211 6,202 6,220	0 / 4 Status Running Available Available		( Current / Processed	Peak / Ma Request	
	No. 1 2 3 4	Thread ID 1397521833 1397521828 1397521823 1397521817	Number 6,204 6,211 6,202 6,220 6,208	0 / 4 Status Running Available Available Available		( Current / Processed	Peak / Ma Request	
	No. 1 2 3 4 5	Thread ID 1397521833 1397521828 1397521823 1397521817 1397521812	Number 6,204 6,211 6,202 6,202 6,208 6,221	0 / 4 Status Running Available Available Available Available		( Current / Processed	Peak / Ma Request	
	No. 1 2 3 4 5 6	Thread ID 1397521833 1397521828 1397521823 1397521817 1397521812 1397521807	Number 6,204 6,211 6,202 6,220 6,208 6,221 6,237 6,185	0 / 4 Status Running Available Available Available Available		( Current / Processed	Peak / Ma Request	
	No. 1 2 3 4 5 6 7	Thread ID 1397521833 1397521828 1397521828 1397521812 1397521812 1397521807 1397521801	Number 6,204 6,211 6,202 6,220 6,208 6,221 6,237 6,185	0 / 4 Status Running Available Available Available Available Available		( Current / Processed	Peak / Ma Request	





Figure 3.11 Confirmation Message after the Export Completes

15. Return to the SWPM by running SAPINST again. Navigate within the SWPM menu to DUAL-STACK SPLIT • <DATABASE> • MOVE JAVA DATABASE • CENTRAL SYSTEM • INSTALL JAVA SYSTEM (see Figure 3.12).



Figure 3.12 Menu Path to Install New Java System

16. When prompted, enter the PACKAGE LOCATION of the Java export created in an earlier step (see Figure 3.13). Click NEXT.

1	2	3	4	5
Choose Option	Define Parameters	Summary	Execute	Completed
ledia Browser >	Software Package F	Request		
nter the location of the req	uired software packages			
Software Package Reque	st			
Software Package Reque Medium	st	Package Lo	ocation	
	st	Package Lo F:\Java.e		Browse

Figure 3.13 Enter the Java Export Directory

17. Select TYPICAL for the PARAMETER MODE, and click NEXT.

18. Enter the new Java System ID (SID) and the location for the new installation directory, which will contain the executables for the Java application server, as shown in Figure 3.14.

Software Provisioning
1     2     3       Choose Option     Define Parameters     Summary       SAP System > General Parameters
Enter the system ID and installation drive
SAP System Parameters SAP System ID (SAPSID)* JBS Installation Drive E: 1
Additional Information The SAP System ID is an identifier for your SAP system. It must be unique throughout your system The system is installed under <installation drive="">:\usr\sap\<sapsid>\</sapsid></installation>
Back Next
Event Wewer

Figure 3.14 SAP Paramters Entry Screen

- 19. Assign a MASTER PASSWORD, and click NEXT. (Note that the default password for system accounts will be the master password.)
- 20. Input the SAP SYSTEM ADMINISTRATOR and SAP SYSTEM SERVICE USER passwords, and click Next (see Figure 3.15).

Software Provis	5			
1 Choose Option	2 Define Parameters	3 Summary	4 Execute	5 Complete
SAP System > OS	User Passwords			
SAP System Administrator	adm			
Account: Vibsa				
Account: V/Dsa Password of SAP System Ac	dministrator			
Account Vbsa Password of SAP System Ac Confirm SAP System Service User	dministrator			
Account: Vbsa Password of SAP System Ac Confirm SAP System Service User	ServiceJBS			



- 21. When prompted to select the DATABASE TO USE, click CREATE NEW DATABASE (DBSID = SAPSID), and click NEXT.
- 22. For the EXPECTED SYSTEM SIZE section, select the system size based on the number of processor cores assigned to this instance (see Figure 3.16). Click NEXT.



Figure 3.16 Selecting the System Size for Database Data Files

- 23. In the SOFTWARE PACKAGE REQUEST section, enter the location of the JAVA COMPONENT media in the PACKAGE LOCATION field (see Figure 3.17), which can be downloaded from *https://support.sap.com/swdc*.
- 24. When prompted, enter the administrator password for the previously exported Java system, and click NEXT.
- 25. Enter the location of the SAP Cryptographic Library to be used during the installation (see Figure 3.18). This library (or SAR file) can be downloaded per instructions from SAP Note 455033.

	2	3	4	5	
Choose Option	Define Parameters	Summary	Execute	Completed	
ledia Browser > S	oftware Package R	Request			
nter the location of the requir	ed software narkages				
ittel the location of the require	eu sonware packages				
Software Package Request					
Medium		Destant	1		
ine arann			Location		
Java Component N₩ 7.0		F:\nw_j	ava_component\5104422	6 8	rows

Figure 3.17 Entering the Directory Containing Downloaded Media

<u>F</u> ile SAP <u>i</u> nst <u>H</u> elp			
Software Provis	sioning		
)1	2	3	4
Choose Option	Define Parameters	Summary	Execute
SAP System > SA	P Cryptographic So	oftware	
Provide the path to the SAP C	ryptographic Library		
Install the SAP Cryptographi	c Library 🔽		
Path to SAPCRYPTO.SAR*	F:\sapcrypto		
	ary is required to enable Secu chive available, you can down		cryption of HTTP connections. P Note <u>455033</u> ,
▲ Back Next ▶			

Figure 3.18 Installing the SAP Cryptographic Library

Software Provisi	oning	
Choose Option	-	3 Summary select the parameters to be cha
		be guided through other screen
Parameter List		
Parameter Mode > Defa Parameter Mode Typical SAP System > General F	Parameters	
SAP System ID (SAPSID) JBS Installation Drive E: 🗈	)	
SAP System > Master P		
Password for all users o	if this SAP system	
CAD Exetom > Mindows	Domain	
Back Next Revise	Show <u>D</u> etail	

Figure 3.19 Software Povisioning Manager Summary Screen

- 27. When prompted, verify the ABAP stack is running, and click OK (see Figure 3.20).
- 28. Verify the results when prompted with a completion message (see Figure 3.21).



Figure 3.20 Confirming the ABAP System Is Running



Figure 3.21 Completion Message from Software Provisioning Manager

29. Return to the SWPM, and run SAPINST. Navigate within the SWPM menu to DUAL-STACK SPLIT • <DATABASE> • MOVE JAVA DATABASE • CENTRAL SYSTEM • REMOVE JAVA STACK FROM DUAL-STACK SYSTEM (see Figure 3.22).



Figure 3.22 Final Step in the Dual Stack Split

- 30. Enter the path to the ABAP system SAP PROFILE DIRECTORY (see Figure 3.23). Click NEXT.
- 31. Enter the PASSWORD OF SAP SYSTEM ADMINISTRATOR for the ABAP stack.
- 32. Next select the DATABASE ID (DBSID) for the ABAP system. Click NEXT.
- 33. Verify the selection criteria on the PARAMETER SUMMARY screen, and click NEXT to begin the removal process (see Figure 3.24).



Figure 3.23 Entering the Path to the ABAP System Profiles



Figure 3.24 Parameter Summary Screen

Sizing 3.3

34. On completion of the task, verify the results when prompted (see Figure 3.25). Click OK.

1		2	3		4	5
Choose Option	Defin	ne Parameters	Summary	0	Execute	Completed
ask Progress						
anti rogross						
e task has completed.						
C	≱ bws	adm@FT-BICI-SBX1:	Message Box		_ 0	x
	6	Execution of				
I phases completed	•	Dual-Stack Split > M	COL Contor >	Iouro Jouro Distah	aca > Control	
Adapt profiles for DVEBM		System > Remove J				rver > Move Java Database
Adapt profiles for DVEBM Clean up file system for [		has completed.				Stack System has been
NW DSS Remove SCE						
P Drop instance				Show Detai	ls <u>Q</u> K	
Remove instance service						
Remove instance directorie	s					
Remove instance profiles			1			
Delete one or more databas	se sch	hemas				

Figure 3.25 Verification of Completion Message from Software Provisioning Manager

35. Confirm the new Java system is running by executing StartSAP as the new Java <SID>ADM user account or by opening MMC to confirm the new instance is running (see Figure 3.26).



Figure 3.26 New Java System Displayed and Running

Separating the ABAP and Java stack is a requirement that must be completed prior to starting the migration to SAP Business Suite on SAP HANA. These procedures

can be executed weeks or months in advance of the migration project. Keep in mind that the screenshots and process in this section assumed no changes in the hardware. The Java instance was separated but remains on the same application servers. This approach limits the amount of change so that testing can be focused at the application layer. If you so choose, you could split the Java stack and move the application server to new hardware or a virtualized OS.

### 3.3 Sizing

Is SAP sizing more art than science? Some consultants think so. SAP has provided clear guidelines on most if not all components, and while there are spot solutions with fuzzy sizing guidelines, the primary components are well documented. SAP also assumes additive sizing. Do you want to run the ABAP application server on the same host (appliance) as the SAP HANA database? Yes, it's supported. And yes, you add the sizing requirements together (ABAP + SAP HANA) to get the total size required. Keep in mind that sizing isn't done in a silo, and it's not done just once. During your SAP Business Suite on SAP HANA migration project, you're going to learn a lot, and you'll have performance data from all the regression tests. Ideally, you'll mitigate the risk of a bad sizing by running a load test before you go-live.

In the beginning, you'll use the ABAP report provided by SAP to perform a SAP Business Suite on SAP HANA sizing from your production system. This provides an estimate for main memory requirements of the SAP HANA database but won't provide an estimate of SAPS (processing power) required for the application servers. At the start of your project, your sandbox will likely have one PAS connected to a SAP HANA appliance. This might be true for development as well because the load will be small. As your project moves forward, we typically see customers with QA environments that closely match their production environments. This QA landscape that closely resembles production is the ideal environment for a load test. Let's explore some of the sizing methods available to you as a customer. And remember—most hardware partners have an SAP sizing competency center that can help you as well.

#### What are SAPS?

SAP Application Performance Standard (SAPS) is a hardware-independent unit of measurement that defines the performance of a system operation in the SAP environment. It was created to independently measure performance across different types or processors. [**%**]

#### 3.3.1 Ballpark Sizing

There is a formula you can use very easily to calculate the approximate size of the SAP HANA appliance you'll need for your SAP Business Suite on SAP HANA migration. It first requires the size of your existing database, which you can retrieve using Transaction DB02. The recommendation from SAP is that you take half of the size of your disk-based database, include a safety buffer of 20%, and add 50GB for the repository, stack, and other services. Let's look at an example:

- 1. Log on to your SAP ERP system with a valid user ID and password.
- 2. Run Transaction DB02, and note the database size displayed (see Figure 3.27).

े Options System Help 🗞 💽 💽 🖌 🗍 🕼 🖗 🖗 ।		<u>XX</u>   (2) <b>D</b>				
Overview						
Full Screen On/Off     Streen B						
Image: System Configuration → DB Connections	Connected to: 🚺 ECD		B ECD () ecd	000 17		
System ECD	] connected to: <u>        </u>				<b>H</b> &	
E System ECD	Database ECD		•			
Microsoft SOL Server: Database Administration	Overview Files	Objects	J			
C System Landscape     Derformance     C System	ERROR CONDITION EXIST		1			
Overview	Number of files					
<ul> <li>Single Table Analysis</li> <li>Largest Tables</li> </ul>	Total Size [MB]	253,65	4			
<ul> <li>Fastest Growing Tables</li> </ul>	Allocated [MB]	253,63				
History	Free [MB]		39 = 0.02 %			
Call Additional Functions     Dackup and Recovery			0.02 *			
Configuration	Log					
• 🗇 Jobs	Number of files		1			
Calerts     Diagnostics	Total Size [MB]	13,11	11			
Cal Download	Allocated [MB]	10	07 = 0.82 %			
<ul> <li>SAP on Microsoft SQL Server in the SCN</li> </ul>	Free [MB]	13,00	04 = 99.18 %			
	Recovery model	FULL				
	Reuse wait reason	LOG_BACKUP				
	Oldest open transaction					
	Started					
	SQL session ID					
	Runtime [minutes]					
	Internal Database Inform	ation				
	Last known good dbcc c	heckdb	03/21/2015 22:00:	16		
	Current internal database	e version	706			
	Initial internal database v	rersion	661			
	Last manual catalog char	nge		Never		
	Number of log rebuilds		0			

Figure 3.27 Database Size of 253GB

3. Using SAP's formula, you can calculate the approximate size of your SAP HANA database. In this example, this roughly calculates a SAP HANA database of 201GB:

HANA DB Size =  $(253GB \div 2 \times 1.2 + 50GB)$ 

#### 3.3.2 SAP Sizing Report for SAP Business Suite on SAP HANA

If your system is already running SAP ERP 6 EHP 7 with the latest versions of the ST-PI ABAP add-on component, then the SAP Business Suite on SAP HANA sizing report already exists in your system. SAP has provided updates to the program, which can be downloaded to your system by implementing SAP Note 2175150 – Suite on SAP HANA Memory Sizing Report. After you've downloaded and implemented the SAP Note, follow these instructions:

- 1. Log on to your SAP ERP system with a valid user ID and password.
- 2. Run Transaction SE38, and input the program name "/SDF/HDB\_SIZING". Click EXECUTE.
- 3. By default, you'll leave the LIST OF TABLES fields blank because you want to get the size for the entire system.
- 4. Uncheck SIZING FOR SAP SIMPLE FINANCE 2.0 (alternate name: SIZING FOR SAP S/4HANA FINANCE) because you're sizing for the migration only. Your team will need to size for SAP S/4HANA Finance later.

#### Note

If you need to size SAP HANA Enterprise for specific tables in SAP ERP, you can use the same program. If your organization wants to implement the SAP HANA sidecar scenario, you can specify the exact tables to be included and get a good sizing for those specific objects.

5. Under TECHNICAL OPTIONS, enter the NUMBER OF PARALLEL DIALOG PROCESSES you want to use. Leaving this with the default of 1 will result in extremely long runtimes.

[**%**]

6. After you make your selections, select PROGRAM • EXECUTE IN BACKGROUND, as shown in Figure 3.28.

G	Program Edit Goto System	Help
	Execute F8	C C Q   L             2 1 1 1 2 1 2    Z    Q
_	Exec <u>u</u> te and Print Ctrl+P	
	Execute in Background F9	
	Exit Shift+F3	
	~	
	Scope:	
	List of tables (Leave empty for full sizing	) to 🗘
	Number of tables displayed in output	20
	Sizing for SAP Simple Finance 2.0	
	Technical options:	
	Number of parallel dialog processes	
	Server group (Leave empty to use all se	rvers)
	Maximum size of samples:	
	0 1.000.000	
	• 100.000	
	0 10.000	
	Changes to stores distribution: (Leave em	
	List of tables to add to standard row sto	
	List of tables to add to standard column	store 🗳

Figure 3.28 Example Options Entered into the SAP Business Suite on SAP HANA Sizing Report

- 7. After the background job completes, you'll see the created spool file.
- 8. In Figure 3.29, you can see the as-is requirement for this example system on SAP HANA will be 135GB of main memory. If we add in a 20% safety buffer, then we arrive at a requirement of 162GB of memory. That is about 40GB less than our ballpark estimate for the same system.

on aprilical display	of spool request 29640 in	n system ECD
1 🗖 🛱 🛱 🖉 🐼	🚇 🧟   🔹 🕨   Settings 🗞	Graphical & Graphic Withou
RESULTS OF SUITE ON H	ANA SIZING IN GB	
Based on the selected	table(s), the anticipated memor	y requirement is:
Column store data		25.1
+ Row store data	14.9	
+ Work space		40.0
+ Hybrid LOB stored on	28.0	
+ Fixed size for code	, stack and other services	50.0
Anticipated total m on disk are cache	emory requirement considering 2 d in memory	0% records stored 135.6
Sizing report:		/SDF/HDB_SIZING
SID		ECD
W release:		740 SP 8
)ate of analysis:		06/23/2015
Version of the report:		44
elected accuracy:		M
Jumber of work process		06
ype of analyzed datab:		
The or guardee gacap		MSSQL
Number of tables succes Number of tables parti:	ssfully analyzed:	95,946 0
Number of tables succe: Number of tables parti:	ssfully analyzed: ally analyzed:	95,946
Jumber of tables succes	ssfully analyzed: ally analyzed:	95,946 0
Number of tables succe Number of tables parti- Number of tables with o	ssfully analyzed: ally analyzed: error:	95,946 0 0
Number of tables succe: Number of tables parti:	ssfully analyzed: ally analyzed:	95,946 0
Number of tables succe. Number of tables parti. Number of tables with of LARGEST COLUMN STORE TABLES	ESTINATED HANA MEMORY SIZE IN GB	95,946 0 0 ESTIMATED RECORD COUNT
humber of tables succe humber of tables parti- humber of tables with o LARGEST COLUMN STORE TABLES EDID4	esfully analyzed: ally analyzed: error: ESTINATED HANA MEMORY SIZE IN GB 3.5	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554
Number of tables succe Number of tables patti Number of tables with LARGEST COLUMN STORE TABLES EDID4 EDID5	esfully analyzed: ally analyzed: error: ESTIMATED HANA MEMORY SIZE IN GB 3.5 2.9	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214
Number of tables succe. Number of tables parti- Number of tables with of LARGEST COLUMN STORE TABLES EDID4 EDID5 WBCROSSGT	ESTINATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714
humber of tables succe. humber of tables parti. humber of tables with of LARGEST COLUMN STORE TABLES EDID4 EDID5 WBCR0SSGT BSEG	ESTINATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 15,017,812
Number of tables succe. Number of tables parti. Number of tables with o LARGEST COLUMN STORE TABLES EDID4 EDID5 WBCROSSGT BSEG DOKTL	ESTINATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 15,017,812 34,145,251
Number of tables succe. Number of tables parti- Number of tables with of LARGEST COLUMN STORE TABLES EDID4 EDID5 WECROSSGT BSEG DOKTL FAGLFLEXA	ESTINATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3 1.0	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 15,017,812 34,145,251 15,017,813
Number of tables succe. Number of tables parti- Number of tables with of LARGEST COLUMN STORE TABLES EDID4 EDID4 EDID5 WBCROSSGT BSEG DOKTL FAGLFLEXA BSIS	ESTIMATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3 1.0 1.0	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 15,017,812 34,145,251 15,017,813 15,017,668
humber of tables succe. humber of tables parti- humber of tables with o LARGEST COLUMN STORE TABLES EDID4 EDID5 WECROSSGT BSEG DOKTL FAGLFLEXA BSIS COEP	ESTINATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3 1.0 1.0 0.9	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 15,017,812 34,145,251 15,017,618 15,017,618 15,017,713
Aumber of tables succe. Aumber of tables parti- Aumber of tables with of LARGEST COLUMN STORE TABLES EDID4 EDID5 WBCROSSGT BSEG DOKTL FAGLFLEXA BSIS COEP REPOSRC	ESTINATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3 1.0 1.0 0.9 0.9 0.9	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 49,248,714 15,017,812 34,145,251 15,017,813 15,017,618 15,017,713 4,125,869
Number of tables succe. Number of tables parti- Number of tables with of LARGEST COLUMN STORE TABLES EDID4 EDID5 WBCROSSGT BSEG DOKTL FAGLFLEXA BSIS COEP REPOSRC EDIDC	ESTINATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3 1.0 1.0 1.0 0.9 0.9 0.6	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 15,017,812 34,145,251 15,017,618 15,017,618 15,017,713 4,125,869 18,458,581
Aumber of tables succe. Aumber of tables parti- Aumber of tables with of LARGEST COLUMN STORE TABLES EDID4 EDID4 EDID5 WBCROSSGT BSEG DOKTL FAGLFLEXA BSIS COEP REPOSRC EDIDC BALDAT	ESTINATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3 1.0 1.0 0.9 0.9 0.9 0.9 0.5	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 15,017,812 34,145,251 15,017,813 15,017,688 15,017,713 4,125,868 18,438,581 1,605,662
Number of tables succe. Number of tables parti. Number of tables with of EARGEST COLUMN STORE TABLES EDID4 EDID5 WBCROSSGT BSEG DOKTL FAGLFLEXA BSIS COEP REPOSRC EDIDC BALDAT SCPRVALS	ESTINATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3 1.0 1.0 0.9 0.9 0.9 0.6 0.5 0.4	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 15,017,812 34,145,251 15,017,618 15,017,618 15,017,713 4,125,869 18,458,562 10,107,814
Number of tables succe. Number of tables parti- Number of tables with of LARGEST COLUMN STORE TABLES EDID4 EDID5 WBCROSSGT BSEG DOKTL FAGLFLEXA BSIS COEP REPOSRC EDIDC BALDAT SCPRVALS SCPRSVALS	ssfully analyzed: ally analyzed: error: ESTIMATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3 1.0 1.0 1.0 0.9 0.9 0.6 0.5 0.4 0.4	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 15,017,812 34,145,251 15,017,618 15,017,618 15,017,618 15,017,618 15,017,618 1,605,662 10,107,814 9,044,524
Aumber of tables succe. Jumber of tables parti- Jumber of tables parti- LARGEST COLUMN STORE TABLES EDID4 EDID5 WECROSSGT BSEG DOKTL FAGLFIEXA BSIS COEP REPOSRC EDIDC BALDAT SCPRVALS SCPRSVALS E071K	ESTINATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3 1.0 1.0 0.9 0.9 0.6 0.5 0.4 0.4 0.4 0.4	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 15,017,813 15,017,813 15,017,813 15,017,713 4,125,869 18,458,581 1,605,662 10,107,814 9,044,524 8,496,894
Aumber of tables succe. Aumber of tables parti- Aumber of tables with of LARGEST COLUMN STORE TABLES EDID4 EDID5 WECROSSGT BSEG DOKTL FAGLFLEXA BSIS COEP REPOSRC EDIDC BALDAT SCPRVALS SCPRVALS EO71K BKPF	ESTINATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3 1.0 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 15,017,812 34,145,251 15,017,813 15,017,813 15,017,713 4,125,869 18,458,581 1,605,662 10,107,814 9,044,524 8,496,894 7,508,939
Aumber of tables succe. Aumber of tables parti- Aumber of tables parti- LARGEST COLUMN STORE TABLES EDID4 EDID5 WBCROSSGT BSEG DOKTL FAGLFLEXA BSIS COEP REPOSRC EDIDC BALDAT SCPRVALS SCPRVALS SCPRSVALS EOTIK BKPF /SLOAP/CLU_STORT	SSFULLY analyzed: ally analyzed: error: ESTIMATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3 1.0 1.0 1.0 0.9 0.9 0.9 0.9 0.6 0.5 0.4 0.4 0.4 0.4 0.4 0.4	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 49,248,714 15,017,812 34,145,251 15,017,813 15,017,688 15,017,713 4,125,869 18,458,581 1,605,662 10,107,814 9,044,524 8,496,894 7,508,939 232,248
Aumber of tables succe. Jumber of tables parti- Jumber of tables parti- LARGEST COLUMN STORE TABLES EDID4 EDID5 WECROSSGT BSEG DOKTL FAGLFLEXA BSIS COEP REPOSRC EDIDC BALDAT SCPRVALS SCPRVALS SCPRVALS EC71K BKPF /SLOAP/CLU_STORT COEK	ESTINATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3 1.0 1.0 1.0 0.9 0.9 0.6 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.3	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 15,017,812 34,145,251 15,017,618 15,01815,018 15,018,018 15,018,01815,018,018 15,018,
Aumber of tables succe. Aumber of tables parti- Aumber of tables parti- LARGEST COLUMN STORE TABLES EDID4 EDID5 WBCROSSGT BSEG DOKTL FAGLFLEXA BSIS COEP REPOSRC EDIDC BALDAT SCPRVALS SCPRVALS SCPRSVALS EOTIK BKPF /SLOAP/CLU_STORT	SSFULLY analyzed: ally analyzed: error: ESTIMATED HANA MEMORY SIZE IN GB 3.5 2.9 2.5 1.4 1.3 1.0 1.0 1.0 0.9 0.9 0.9 0.9 0.6 0.5 0.4 0.4 0.4 0.4 0.4 0.4	95,946 0 0 ESTIMATED RECORD COUNT 73,210,554 55,048,214 49,248,714 49,248,714 15,017,812 34,145,251 15,017,618 15,017,713 4,125,869 18,458,581 1,605,662 10,107,814 9,044,524 8,496,894 7,508,939 232,248

Figure 3.29 Example Output from the SAP Business Suite on SAP HANA Sizing Report

#### 3.3.3 SAP Quick Sizer

The SAP Quick Sizer is another tool you can use to accurately size your SAP Business Suite on SAP HANA environment. There are two means of performing a sizing within the Quick Sizer: user-based sizing and throughput-based sizing. The latter requires more time and effort. User-based sizing is a count of users by activity type (more on that shortly). Throughput-based sizing focuses on the quantity of documents within your systems and the frequency at which they occur. Getting this information will take time, but it can provide an extremely accurate sizing estimate. However, as we've said before, the only way to mitigate the risk of a potentially bad sizing is to perform a performance test of the target landscape before go-live. If your team doesn't have the capacity to perform a throughput sizing, you can mitigate this risk with a performance test. Our goal with this section is to provide you with enough detail to understand the effort required and where to find more information on the Quick Sizer.

A user-based sizing will give you the quickest time to a number, which you can then provide to a hardware vendor. User-based sizing breaks down users into three categories by user activity type because not all users are created equal. The Quick Sizer also lets you enter user counts by time period. If your organization operates in multiple time zones, this feature will let you input user activity at varying times in the day. User-based sizing also has a field to capture data retention period by module. In the following examples, we entered a value of 84 months or 7 years. This is only an example, and ideally your organization has some data retention policy you can reference when completing these steps. Here's a summary of the user activity types you can use in user-based sizing:

#### Low-activity user

This user is an informational or executive user in SAP ERP. These users perform 10 dialog steps within an hour.

Medium-activity user

This user is someone whose daily job duties primarily occur in SAP ERP, for example, accountants, clerks, shop floor workers, and so on. These users perform 120 dialog steps an hour or one click in SAP ERP every 30 seconds during work hours.

#### ► High-activity user

This is a heavy user of the system, for example, customer service agents, data entry users, or system administrators. These users perform 360 dialog steps in an hour or one click every 10 seconds in SAP ERP.

You can easily find the activity level of users within your system by following these steps:

- 1. Log on to SAP ERP with a valid user ID and password.
- 2. Run Transaction ST03N.
- 3. From the upper-left area, expand the node WORKLOAD TOTAL MONTH, and double-click the last full month of data.
- 4. Double-click WORKLOAD OVERVIEW under ANALYSIS VIEWS in the lower-left area.
- 5. Select the USER tab to see the user types by activity, as shown in Figure 3.30.

Workload in System ECL	2			
← →   🗿 🖽 Full Screen On/Off	Gave View			
Expert mode      //     ///     ///     ///     ///     ///     //    //     //     //     //     //     //			Last record 05/3 Time period 31	1/2015 00:00:00 1/2015 23:59:59 Day(s) 00:00:00
Cli Month     Dis month     Discrete     Os/2015     Od/2015	B 및 음 User by Activ	MRF. Z.%, DØ.C		
B 03/2015     B 02/2015     B 02/2015     B 01/2015     B 12/2014     B 11/2014     B 11/2014     B 09/2014     B 09/2014	User Category High Medium Low Total Number of Use	User 11 4 20		
4 🕨 💷 4 🕨				

Figure 3.30 Users Listed by Activity Type

Now, you'll notice the rules give you the activity type by user but don't break it down by functional area. Your team will have to determine this. You can look at logons for the month analyzed to develop a list of users that you've assigned to a primary functional area. You know that users typically don't work within one module, so you need to identify the primary functional area they are responsible for.

When accessing the Quick Sizer, you'll notice your customer number and a project name displayed. These are important identifiers because after your sizing estimation is complete, you can share your Quick Sizer report directly with certified SAP hardware providers or other individuals in your company. The project name can be any text value that you associate with the project activity (i.e., SAP HANA Migration).

You'll also notice in the Quick Sizer that your project will have a status value. When setting your project to GoingLive, this will enable integration between your SAP Enterprise Support service called the GoingLive Analysis with the Quick Sizer project. SAP Support will essentially review your sizing project and then compare it to the actual hardware you've deployed. This ensures that your actual system will meet the needs of the sizing you estimated.

#### **Accessing Quick Sizer**

To access Quick Sizer, follow these steps:

- 1. Log on to the SAP Support Portal via the direct link to the SAP HANA version of the Quick Sizer at *http://service.sap.com/hanaqs.*
- 2. On the initial screen, enter a PROJECT NAME, and click CREATE PROJECT, as shown in Figure 3.31.

C Find: activity	Previous Next Ø Options •
Customer no. Project Name SANDBOX	]
Create Project Change Project Create with ref. Display Project Show my Projects Show examples	
Quick Sizer for beginners	

Figure 3.31 Example Entry Screen for the SAP HANA Version of the Quick Sizer

- 3. Initially, the PROJECT SANDBOX screen appears with several helpful items displayed (see Figure 3.32). Click HARDWARE VENDORS to get contact information for the SAP sizing competency center for each vendor.
- 4. Click QUICK SIZER TOOL DOCUMENTATION to access the guide to using the tool.
- 5. In the New System/System Extension section, you must decide between New SAP Business Solution/Software Component and SAP Business Solution/ Software Component Extension. If you size as a new solution, your hardware can tell you what existing hardware will support what you've sized.
- 6. The PLATFORM AND COMMUNICATION, SYSTEM AVAILABILITY, and NETWORK INFRASTRUCTURE sections are optional. They help provide the hardware vendor and SAP with more background information.

Save Print page Calculate Set to 'Final' Feedback				Hardware Quick Size	vendors Sin r tool documen	gle Computing Ur tation Disclaim	
Project SANDBOX							
Workdays 220	Status   In progress 🗸	Owner Cu	stomer 💊	/ Nethod	All	~	
Messages							-
<ul> <li>Corresponding sizings w</li> <li>The system automatical</li> </ul>	-			questionnaire 'SAF	P Simple Finan	ce add-on'.	
Project Data							
Customer no. 1147308	Created by	S0007997187	Created on	23.06.2015	Version date	23.06.2015	
Project Name SANDBOX	X Modified by	S0007997187	Modified on	24.06.2015	Version	239	
New System / System Exte	ension						
New SAP Business Solu	tion/Software Component	C SAP Business	Solution/Softwar	e Component Exte	ension		
Per default, gross results an If you choose 'SAP Busines' This choice is saved for the	s Solution/Software Comp				).		
Platform and Communicat	ion						
System Availability (inform	nation only, not included	in Quick Sizer calc	ulation)				
Network Infrastructure (inf	formation only, not inclue	led in Quick Sizer o	alculation)				

Figure 3.32 Project Information Screen in the Quick Sizer

- 7. If you look to the left of your screen, you can see a navigation tree with multiple components under SAP BUSINESS SUITE ON SAP HANA.
- 8. The items you select will depend on the scope within your organization's SAP ERP environment. In the example in Figure 3.33, there is data for a user-based

sizing with SAP S/4HANA FINANCE, LOGISTICS EXECUTION, PRODUCT DEV & EXE-CUTION, and SALES & SERVICE.

٠,	Save Print nage C	alculate result Set to 'GoingLive' Set to 'Final'	Feed	back ]		Hardware vendors	Single Compu	ting Unit Quick	Sizer tool docume	ntation Disclair	ner
	Project SANDBOX										
Change project 'SANDBOX'											
	Workdays 220	Status In progress V   Owner	ustomer		V Method All	~					
Customer no. 1147308											
Project Name SANDBOX											
Limit User Access	Messages										
Exit	Corresponding si	zings with the other sizing method can be entered in t	the Quic	ksizer 1	or questionnaire 'SAP Simple Final	nce add-on'.					
		natically saved the data for 'SAP Simple Finance add									
											_
	The second second									-	-
HANA		fault Values Less Details Clear Questionnaire							How to	o fill in the question	inaire
Search	SAP ERP 6.0 -> Logis	tics Execution : Change									
	Avg. workday Sta										
Search in Tree		rt End Peak load Start	End								
Match whole word Phrase 🗸	100		]]15.00	~							
Input Navigation Tree	Table 1: Concurrent	Users - Standard Sizing									
<ul> <li>SAP Business Solutions</li> </ul>		-		-							_
Project Information		The buttons in this line only work for marked lines in	the low	er table							
<ul> <li>SAP Business Suite powered by HANA</li> </ul>	Element	Element short text	A/P	TI	No. of low activity users No.	<li>of medium activity us</li>	No. of h	ligh activity users	Residence tim	Your short text	
AP Fiori	LE-USER	User in Logistics Execution	A	S	30	6	i0	20	84		
SAP CRM											
<ul> <li>AP Web Channel Experience Mgmt.</li> </ul>	I and the second second										
▼ SAP ERP	Table 2: Throughpu	t - Standard Sizing									
<ul> <li>SAP Simple Finance add-on</li> </ul>	Delete/Clear In	sert 1 line(s) The buttons in this line only wor	k for ma	rked lir	es in the lower table.						
Ontract Accounting	E Element	Element short text	A/P	TI	Sizing objects in time frame *	Line items *	Changes in %	Displays in %	Residence tim	Data archiving	Sta
👻 🔗 Human Capital Mgmt.	LE-WM	Warehouse Management - transfer orders	A	Υ							09
<ul> <li></li></ul>	LE-WM	Warehouse Management - transfer orders	Р	Р							12
<ul> <li>A: Logistics Execution</li> </ul>	LE-SHP	Delivery notes and goods issue	A	Y							09
<ul> <li>Product Dev. &amp; Execution</li> </ul>	LE-SHP	Delivery notes and goods issue	P	Р							12
<ul> <li>Sales &amp; Service</li> </ul>		bonner) notes and group acts									
<ul> <li>O Corporate Services</li> </ul>											
SAP SCM	Comment (max. 750 c	haracters):									
<ul> <li>SAP Transportation Management</li> </ul>											-
SAP SRM											^
SAP Global Trade Services											
<ul> <li>Analytics Solutions</li> </ul>											
<ul> <li>SAP BusinessObjects Business Intelligence</li> </ul>											
(Further) Analytics Solutions Sizing Guidelines											~
Industry Solutions											~
- CAD Mattheouser											

Figure 3.33 Example User-Based Sizing for SAP Business Suite on SAP HANA

- 9. In Figure 3.33, you can see that we entered a total of 100 Logistics users, with a data retention of 84 months for this example. We entered similar data for the other SAP ERP components to simulate a sizing for a system with 600 active users.
- 10. Click on CALCULATE RESULT at the top of the screen to see a summary of the sizing (see Figure 3.34).

In Figure 3.34, we used the default of 220 workdays per year, with the average workday running from 9AM to 6PM, and peak load occurring from 9AM to 11AM and 1PM to 2PM. Based on the 600 users we entered, with a retention period of 84 months for SAP ERP, the Quick Sizer believes we'll need a SAP HANA appliance with essentially 1TB of capacity to support both our user load and data volumes. We also get a SAPS number for the application server in the sizing summary. The Quick Sizer doesn't know if our ABAP AS will be on the same hardware as SAP HANA or separate. We would add these values together if they will be installed on the same host.



Figure 3.34 Example Sizing Results Displayed

Sizing your new SAP Business Suite on SAP HANA system using the Quick Sizer can get very complicated if you move into the throughput-based sizing method. Using this sizing method, you need to capture or estimate specific activity within your SAP ERP system. If you believe you require this level of sizing, we recommend engaging a certified SAP sizing professional either through SAP or one of its certified partners.

Sizing 3.3

[**«**]

In this section, we described how to perform initial sizing estimations, how to execute the ABAP report for SAP Business Suite on SAP HANA sizing, and how to perform the user-based sizing method using the Quick Sizer. SAP and its certified hardware partners are available to support your organization through this process. Uncertainty as to what hardware you need to migrate SAP Business Suite on SAP HANA can be easily remedied by using the solutions described in this chapter and engaging your hardware partner early in the process. SAP sizing tools exist to ensure success at your go-live. This isn't a process you'll only execute once during the project. As you continue to learn during the upgrade and migration process, you'll need to add reminders throughout your project to revalidate the sizing that was completed. And, don't forget, you can mitigate risk due to a bad sizing by running a performance test during your project.

#### [»] Note

For even more information on SAP sizing, training events, and how-to guides, see the SAP Service Marketplace at *https://service.sap.com/sizing*. Click on the SAP HANA QUICK SIZER link to access the SAP Business Suite on SAP HANA sizing tool.

### 3.4 Backup and Recovery

When SAP HANA was initially released and touted as an in-memory database, the IT person in all of us wondered how data in-memory is handled when the system crashes. Rest assured, SAP thought of this well before releasing SAP HANA to the public. SAP HANA is an in-memory database that also uses persistent storage. This allows you to backup and recover the database just like any other database on the market. You have graphical, command-line, and third-party backup tools that enable you to recover when the power is cut, a disk drive fails, or an entire data center has a catastrophe. Both data and log backups are completed online, with negligible impact to the users. Parameters in SAP HANA are set by default, but customers can change these to determine their own recovery point objective (RPO). Focusing on your SAP Business Suite on SAP HANA migration project, we'll cover the backup and recovery scenarios that are specific to a scale-up scenario or a single node. SAP Business Suite on SAP HANA isn't yet supported on a scale-out scenario, so we'll avoid the backup and recovery options for a multinode environment. We'll also point out where you can enable third-party backup

options, but we won't cover those vendor tools specifically. The concepts we'll cover apply to both SAP HANA-provided tools and third-party tools.

#### Note

Want to know more about available third-party certified backup options? Go to *http://global.sap.com/community/ebook/2013\_09\_adpd/enEN/search.html*, and enter "hanabrint" into the search box. A list of currently certified partners will be displayed.

#### 3.4.1 Backups

Your organization's backup strategy will be a combination of SAP recommendations, industry best practices, and lessons learned from operating an SAP ERP system in your environment. SAP supports data backups, storage snapshots, and log backups. These backups can be used to recover the system in the event of failure to the most recent point in time or a specific point in time, or they can be used as the source for a system copy. The backup and recovery function will be performed and set up by your SAP NetWeaver (Basis) administrators in coordination with the infrastructure team that supports the backup devices and storage solutions (ideally, the SAP NetWeaver administrator attended the HA200 class we talked about earlier). SAP recommends a backup strategy that leverages all types of backups available, specifically, a daily storage snapshot, automatic log backups, and a complete data backup once a week. In the event of a failure during the week, you can either restore from the nightly storage snapshot or from the complete data backup, and then read the logs from the automatic log backup. If you have a failure in your storage solution, the storage snapshot won't be available, but the complete data backup will be because you would have saved it to a location other than the local SAP HANA system. Leveraging all backup types mitigates risk and dependencies on a single component of the backup solution.

As you dig into the administration, backup, and recovery of SAP HANA, you'll see references to the savepoint. As we mentioned, SAP HANA persists data on disk. During normal operations, changed data is automatically saved from memory to disk at regular savepoints. The time period for the savepoint is set by default to every five minutes, but this value can be changed. So, every five minutes, the savepoint is defined, and data is written to disk. If you think about a system restart, the savepoint reduces the time to restart because it doesn't have to read all redo log files. Only those redo logs that occurred after the most recent savepoint

need to be read after a system restart. It's important to know that savepoints are written asynchronously by each service within SAP HANA. A global savepoint is a consistent collection of savepoints for all services in the system. For example, a global savepoint is written when you start a complete data backup. The point here isn't to make you an expert at SAP HANA database backup and recovery, but instead to talk about critical components of the backup mechanisms. If during your SAP Business Suite on SAP HANA migration, you begin to see errors related to the savepoint, you now know this is related to the ability to recover or restore your system.

#### [»] Note

Want to become an SAP HANA backup expert? Check out the SAP HANA Administration book (SAP PRESS, 2014). Or see more by going to *http://help.sap.com* and choosing TECHNOLOGY PLATFORM • SAP HANA PLATFORM • SYSTEM ADMINISTRATION AND MAINTENANCE INFORMATION • SAP HANA ADMINISTRATION GUIDE.

Now let's walk through a system backup using SAP HANA Studio:

- Be sure to download and install SAP HANA Studio from the SAP Software Download Center at *https://support.sap.com/swdc*.Then choose SUPPORT PACK-AGES & PATCHES • A-Z PRODUCTS • H • SAP HANA PLATFORM EDITION • SAP HANA PLATFORM EDIT. 1.0 • ENTRY BY COMPONENT • HANA STUDIO.
- 2. Launch the SAP HANA Studio, select FILE NEW FOLDER, and give the folder a name. The folder is a logical grouping of systems. You can have one folder for the entire landscape or one folder per Software Development Lifecycle (SDLC) phase (development, QA, production). The folder only exists locally.
- 3. Right-click the folder you created, and click ADD SYSTEM. Enter the server name, instance number, and a description. Click NEXT.
- 4. Choose AUTHENTICATION BY DATABASE USER, and enter the credentials given to you by your SAP HANA installer. Click FINISH after you've entered the user ID and password.
- 5. Right-click the system you added, and select LOGON.
- 6. Right-click the BACKUP folder, and select OPEN BACKUP CONSOLE, as shown in Figure 3.35.

le <u>E</u> dit <u>N</u> avig	ate <u>P</u> roject <u>R</u> un <u>W</u> indow <u>H</u> elp	
- 8 6 8		
Systems 🛛 🖡	┇╸	
	<b>IPYTEL)</b> NIMBL (MPYTEL) Y <b>STEM)</b> Hana Lad	
	New	+
> Co	Open Backup Console	
▶ 🗁	Back Up System	
	Manage Storage Snapshot	



- 7. The initial screen displays backups in progress, if any, and the most recent successful backup. Click the BACKUP CATALOG tab to see the backup history detail.
- 8. If you want to run a backup now, then right-click the BACKUP folder and select BACK UP SYSTEM, as shown in Figure 3.36.

5			SAP HANA Adminisu	auon console	e - System:	HDB Host I	/ 2.31.254.193 Instanc	ce: 00 Connected User:
ile <u>E</u> dit <u>N</u> avig	ate <u>P</u> roject <u>R</u> un <u>W</u> indow <u>H</u> elp							
1 - 8 6 6			🖆 🖞 = 🖓 = 🧐 🖉	⇒ ⇒ →				
Systems 🛛 🗎	┇╸┛║╸┉╝┍╚、▽╴╴	🗆 🖄 Backup I	🖄 Backup HDB (SYSTEM) HANA Lab 🕴					
		( Pack	A Backup HDB (SYSTEM) HANA Lab					
📋 HDB (M	IPYTEL) NIMBL (MPYTEL)	E Dack	up nob (STSTE	M) HANA L	av			
	YSTEM) HANA Lab	Overview (	Configuration Backup Ca	talog				
(*) E	New	kup Ca	italog					
			Log Backups					
> G P	Open Backup Console			-	-		-	
> @ s	Back Up System	tatus	Started	Duration		Backup Type	Destinatio	
	Manage Storage Snapshot	þ	Jun 24, 2015 8:01:01	00h 04m 38s	40.63 GB		File	
			Jun 23, 2015 8:01:01	00h 04m 34s	40.34 GB		File	
			Jun 22, 2015 8:01:01	00h 04m 35s		Data Backup	File	
			Jun 21, 2015 8:01:01	00h 04m 37s	39.89 GB	Data Backup	File	
			Jun 20, 2015 8:01:02	00h 04m 16s	39.78 GB	Data Backup	File	
		•	Jun 19, 2015 11:00:0	00h 00m 13s	0 B	Data Backup	File	
			Jun 19, 2015 8:01:01	00h 04m 27s	39.65 GB	Data Backup	File	
			Jun 18, 2015 8:01:01	00h 04m 20s	39.21 GB	Data Backup	File	
			Jun 17, 2015 8:01:01	00h 05m 20s	39.10 GB	Data Backup	File	
			Jun 16, 2015 8:01:01	00h 04m 30s	38.79 GB	Data Backup	File	
			Jun 15, 2015 8:01:01	00h 04m 29s	39.49 GB	Data Backup	File	
			Jun 14, 2015 8:01:01	00h 04m 39s	39.65 GB	Data Backup	File	
			Jun 13, 2015 8:01:01	00h 04m 34s	39.62 GB	Data Backup	File	
		•	Jun 12, 2015 11:00:3	00h 00m 09s	0 B	Data Backup	File	
			Jun 12, 2015 8:01:01	00h 04m 29s	39.43 GB	Data Backup	File	
			Jun 11, 2015 8:01:01	00h 04m 43s	39.26 GB	Data Backup	File	
		8	Jun 10, 2015 8:01:02	00h 06m 09s	38.29 GB	Data Backup	File	
			Jun 9, 2015 8:01:01 P	00h 04m 42s	38.21 GB	Data Backup	File	
		8	Jun 8, 2015 8:01:01 P	00h 04m 50s		Data Backup	File	
		8	Jun 7, 2015 8:01:01 P	00h 04m 19s	37.61 GB	Data Backup	File	
			Jun 6, 2015 8:01:01 P	00h 04m 41s	37.54 GB	Data Backup	File	
			Jun 5, 2015 11:00:08	00h 00m 07s		Data Backup	File	
			Jun 5, 2015 8:01:01 P	00h 04m 44s	37.47 GB		File	
			Jun 4, 2015 8:01:01 P	00h 04m 11s	37.38 GB		File	
			Jun 3, 2015 8:01:02 P	00h 04m 50s		Data Backup	File	
			Jun 2, 2015 8:01:01 P	00h 04m 44s		Data Backup	File	

Figure 3.36 Backup Catalog Displayed

9. Review the parameters on the SPECIFY BACKUP SETTINGS screen. Adjust the BACKUP DESTINATION OF BACKUP PREFIX if required (see Figure 3.37). Click NEXT.

pecify the inform timated backup	ation required for the data backup size: 40.55 GB.
Backup Type	Complete Data Backup 🔍
Destination Type	File 🗸
destination, ensu	nation is used unless you specify a different destination. If you specify a new re that the directory already exists. For improved data safety, we recommend that ternal backup destination.
destination, ensu	re that the directory already exists. For improved data safety, we recommend that ernal backup destination.
destination, ensu you specify an ex Backup Destinatio	re that the directory already exists. For improved data safety, we recommend that ernal backup destination.
destination, ensu you specify an ex Backup Destinatio Backup Prefix i Note that cus part of the da	re that the directory already exists. For improved data safety, we recommend that ternal backup destination.

Figure 3.37 Default Backup Location and Description

10. On the next screen, confirm the settings, and then click FINISH.

11. You get a message that the backup is running (see Figure 3.38). Wait for the status to update, and then click CLOSE.



Figure 3.38 Backup Status Displayed during the Backup Execution

#### 12. Confirm the results, and click CLOSE.

What we've shown covers a system backup. The automatic log backup functionality will facilitate the log backups to the specified directories in the GLOBAL.INI. We've only covered the very basic backup scenario you would use during the initial phases of your project. Your backup strategy will need to be automated, which is supported by SAP HANA out of the box. All backups and restores can be run from the command line in addition to SAP HANA Studio, the Database Administration Cockpit (DBA Cockpit), or the SAP Database Control Center (DCC; more on this in Chapter 9). Thankfully, SAP has provided an excellent backup script and documentation on how to use that script with Cron in Linux. Attached to SAP Note 1651055 – Scheduling SAP HANA Database Backups in Linux, you'll find two files. One file is a compressed file with the script and configuration file. The second is a PDF document describing the usage of the backup script. The script can perform multiple functions related to backup paths, naming conventions, retention periods, backup catalog maintenance, and listing backups available. Figure 3.39 is an example from our lab environment. In this example, we keep two days of backups on a shared storage. For good measure, we move one backup to a cloud location daily. This ensures that we can restore in the event of an appliance or storage failure.

2	1 - PuT
mdbmaster:/usr/sap/HDB/HDB00> crontab	-1
DO NOT EDIT THIS FILE - edit the mast	er and reinstall.
(/tmp/crontab.XXXXdbmYcJ installed on	Wed Mar 11 14:31:20 2015)
(Cron version V5.0 \$Id: crontab.c,	v 1.12 2004/01/23 18:56:42 vixie Exp \$)
+ Minute (0-59)	Output Dumper: >/dev/null 2>\$1
+ Hour (0-23)	Multiple Values Use Commas: 3,12,47
+ Day Of Month (1-31)	Do every X intervals: */X -> Example: */15 * * * * Is every 15 minutes
+ Month (1 -12)	Aliases: @reboot -> Run once at startup; @hourly -> 0 * * * *;
+- Day Of Week (0-6) (Sunday	= 0)   @daily -> 0 0 * * *; @weekly -> 0 0 * * 0; @monthly ->0 0 1 * *;
	Gyearly -> 0 0 1 1 *;
1 02 t t t /earints/heakun shaonfia	-file=/scripts/backup config.cfg -q -pretention=2 > /scripts/backup.log
mdbmaster:/usr/sap/HDB/HDB00>	-iiie-/scripts/backup_config.org -q -precention-z //scripts/backup.log
mubmaster:/usr/sap/hbb/hbboo>	

Figure 3.39 Retaining Backups for Two Days Using the Retention Parameter

#### 3.4.2 Recovery

The recovery tools in SAP HANA include features you expect from a modern database. You can recover to the latest point in time or a specific point in time, and you can use the recovery tools to restore to a new system to create a copy of the database. Unlike backups that can be run while the database is operational, the recovery process must be done while the database is shut down. Here are some other restrictions that apply when attempting to recover a database:

- At the start of the recovery, all data and log backup files must be accessible in the system or via the third-party backup tool.
- To recover the database, you need at least one full database backup.
- The recovery must be executed on a system that is the same release or higher than the source system.
- You can't pause and resume a restore. After the restore starts, you can cancel; however, the database will be left in an inconsistent state.
- There are no restrictions on restores from multinode systems to single-node systems or the reverse.
- The permanent license is restored if the system ID and landscape ID haven't changed. If either has changed, a temporary license will be installed that is valid for 90 days.

In Figure 3.40, you can see three options to recover your SAP HANA database. During the SAP Business Suite on SAP HANA project, you may want to restore the database in multiple scenarios.



Figure 3.40 Example Restore Scenarios

In one example, you might want to run your cutover procedures multiple times to develop the shortest execution strategy. In this scenario, you complete an SAP Business Suite on SAP HANA migration, take a full backup, and then let your team execute the cutover plan. After they finish, you can validate the system. If the timing was too long, or something wasn't correct, you'll need to restore the database and try again. Without the backup and restore scenario, you would have to run the entire migration again. Another scenario includes a QA refresh after the production go-live. In this scenario, you execute your go-live cutover procedures and system validation, and right before you release the system to the end users, you take a backup. You then restore that backup to the QA system as a system copy to provide a working copy of production to support defect resolution.

Your SAP NetWeaver administrators will become very familiar with your backup and restore process. Now, let's walk through an example database restore using SAP HANA Studio. There are command-line options to perform the restore as well.

- 1. Log on to the SAP HANA database using SAP HANA Studio, which you downloaded and installed in Section 3.4.1.
- 2. Right-click the system, and select BACKUP AND RECOVERY RECOVER SYSTEM (see Figure 3.41).

) ile Edit Navigate Pr	oject	t Run Window Help		
1 - I & L   0	ż	$\bullet = \bullet \bullet \bullet \bullet \bullet \bullet$		
⊕ Systems 👷				
	) HDI ) NIM	IBL (MPYTEL) SHDB (New) Configuration and Monitoring		
⊳ 🗁 Catalog ⊳ 🗁 Provisionii ⊳ 🗁 Content	4	Lifecycle Management Backup and Recovery Security		Open Backup Console
▷ ➢ Security IDB (SYSTEM)	SQL	Open SQL Console		Back Up System Manage Storage Snapshot Recover System
	73	SAP HANA Modeler New Add System with Different User	•	Recover system
	×	Remove	Delete	
	69	Log Off Refresh	F5	
		Properties	Alt+Enter	

Figure 3.41 Starting a Database Restore on SAP HANA

3. Enter the <SID>ADM user ID and password if prompted.

4. Confirm that the database can be shut down.

5. Specify the recovery type by selecting RECOVER THE DATABASE TO THE FOLLOW-ING POINT IN TIME to simulate the restore you might run during the project (see Figure 3.42).

6	Recovery of System HDB	×
Specify Recovery Type		
Select a recovery type.		
Recover the database to its most receiption	ent state ®	
Recover the database to the following	g point in time <sup>®</sup>	
Date: 2015-08-31	Time: 10:35:52	
Select Time Zone: (GMT-06:00) Mou	intain Daylight Time	~
i System Time Used (GMT): 2015-	08-31 16:35:52	
○ Recover the database to a specific da	ta backup or storage snapshot 🖯	
		Advanced >>
?	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish	Cancel

Figure 3.42 Selecting the Point in Time for Recovery

6. Click NEXT, and choose the LOCATIONS of the backups (see Figure 3.43). You can add multiple locations here, for example, the "cold" storage location.

	Recovery of System HDB	
cate Log Ba	kups	
pecify location(s	of log backup files to be used to recover the database.	
If the log ba location. If y	o log backups were created, a location is still needed to rea kups were written to the file system and subsequently mo u do not specify an alternative location for the log backup were first saved. The directory specified will be searched re	ved, you need to specify their current os, the system uses the location where the
Locations:	nere nine survey specified nin be reacticed to	Add
	/backup/log	Remove All
		Remove
Backint System Backint Syste		
Source System:		
?)	< Back	t> <u>F</u> inish Cancel

Figure 3.43 Selecting Locations for Backups

7. An overview of the data backups is displayed (see Figure 3.44). You can manually input an ALTERNATIVE LOCATION, and then click CHECK AVAILABILITY.

	to 2015-08-31 10:35:52. (Mo	ountain Standard Time)			
Backups	all a second a distance	had we state and the second state of the secon			
o have the shortest recove		e backup catalog as successful. The	е васкир	at the top	is estimated
Start Time	Location	Backup Prefix		Available	e
2015-08-31 10:22:21	/backup/data/	COMPLETE_DATA_BAC	•		
2015-08-17 10:00:13	/backup/data/	COMPLETE_DATA_BAC	$\diamond$	4	Available in orig
2015-08-13 15:16:36	/backup/data/	COMPLETE_DATA_BAC	$\diamond$		
2015-08-12 09:48:45	/backup/data/	COMPLETE_DATA_BAC	$\diamond$		
2015-08-05 20:26:57	/backup/data/	COMPLETE_DATA_BAC	$\diamond$		
				Refresh	Show More
				Kerresh	Show More
Details of Selected Item		열 것이 없는 것 같아요. 말 같아요. 것 같아요.			
	5-08-31 10:22:21 Destination		-	stem: HD	
	0 GB Backup ID:	: 1441038141524 E	xternal B	ackup ID:	n.a.
	ckup/data/COMPLETE_DAT	A_BACKUP			

Figure 3.44 Confirmation that the Backup Is Available

- 8. Select the data backup, and choose NEXT.
- 9. The wizard now lets you choose some additional options. You can select USE DELTA BACKUPS to potentially shorten the restore time if they are available.

10. Click NEXT after you've confirmed your options (see Figure 3.45).

ß	Recovery of System HDB – 🗆 🗙
Other Settings	
recovery process. If delta or log data is changed. If you choose i significant loss of time if the co Check the availability of delta a I File System Third-Party Backup Tool (Ba Initialize Log Area	whether all required delta and log backups are available at the beginning of the backups are missing, they will be listed and the recovery process will stop before any not to perform this check now, it will still be performed but later. This may result in a mplete recovery must be repeated. nd log backups:
entries will be deleted from the	
Use Delta Backups Select this option if you want to without delta backups, only log Vuse Delta Backups (Recomm	
You can: - Select a new license key to ins	n a different system, the old license key will no longer be valid tall now Jally after the database has been recovered Browse
	< <u>Back</u> <u>Next</u> <u>Finish</u> Cancel

Figure 3.45 Additional Restore Options for SAP HANA

- 11. Review the summary screen, and click FINISH to begin the restore. You should see a progress screen like the one shown in Figure 3.46.
- 12. If successful, you'll see the message SYSTEM <SID> RECOVERED (see Figure 3.47). Click the CLOSE button, and confirm that SAP HANA services have been started.

Host: hanael	shdb.nimblhq.com (Master)	
XSEngine	65.27 MB of 65.27 MB	
Name Server	68.11 MB of 68.12 MB	
Index Server	0 B of 88.07 GB	

#### Figure 3.46 Restore Status Screen

i System HDB recovered		
3 volumes were recovered		
Recovered to Time:	Aug 31, 2015 10:34:45 AM GMT-06:00	
Recovered to Log Position:	3080633280	

Figure 3.47 Summary Screen Confirming Restore Complete

#### 3.5 Summary

In this chapter, we focused on some of the infrastructure requirements needed to prepare your landscape for the SAP Business Suite on SAP HANA migration. Your organization will need to manage multiple types of change during the project. Your technical team will be managing a new hardware platform, learning to manage a new database, and potentially making changes to a landscape that has been stable for several months or years. These will be challenging times. However, you can mitigate risk by following the guidelines and best practices published by SAP. Performing the ABAP and Java stack split early on, in addition to the enqueue server split, will save time and reduce risk during the actual migration to SAP Business Suite on SAP HANA.

In the sizing section, you learned about the varied sizing activities you can perform. You can initially perform a rough sizing; however, the ABAP report provided by SAP is so simple to install there really isn't a need to guess. It estimates the required size of the SAP HANA appliance from your current production environment, to which you can add the SAP recommended 20% for safety purposes. Finally, in the sizing section, we talked about the user-based and throughputbased sizing. The user-based sizing requires more time than the ABAP report because you need to sort your users by functional area into activity types. The more accurate throughput-based sizing requires significantly more effort due to the extensive data you need to collect about your organization. Remember that bad sizing estimates can be mitigated by running a performance test during your project. Performance testing tools can now be purchased on a term basis (e.g., 60 days), utilized for the project, and then decommissioned after your project is complete. The performance test is the insurance policy for not collecting or focusing enough energy on a throughput sizing.

We ended the infrastructure topic on backup and recovery. While this section was merely an introduction to the options available with SAP HANA SP 09, you should now appreciate how important those tasks will be to your project. Depending on your landscape strategy (five-system or four-system), your team might be performing several restores or system copies over the life of the project. The features we covered in this chapter were focused on SAP HANA SP 09 and below. We know that SAP has planned innovations in SP 10 to include new backup types and capabilities, but your SAP Business Suite on SAP HANA backup and recovery strategy probably won't need to change unless the business is asking for higher Service Level Agreements (SLAs). You still have the ability to perform periodic weekly, monthly, and ad hoc full backups whenever required. The policy governing when and why SAP ERP is backed up won't change. However, the procedures and documentation of the tools will need updating.

# Contents

Introduction	13
Acknowledgments	17

#### PART I Preparation

1

SAP	HANA, SAP ERP, and SAP S/4HANA	21
1.1	What Is SAP ERP on SAP HANA? 1.1.1 Software	
	1.1.2 Hardware	25
1.2	What Is SAP S/4HANA?	26
1.3	SAP HANA and the Relational Database Management System	28
1.4	In-Memory Database versus Caching	30
1.5	SAP HANA Architecture Options	32
1.6	Summary	37

# 2 Establishing Project Scope ...... 39

2	2.1	Upgrade	e and Migration Dependencies	40
		2.1.1	Enhancement Packages	40
		2.1.2	Support Packages	44
		2.1.3	Add-On Compatibility	49
		2.1.4	Non-Unicode versus Unicode	52
		2.1.5	Upgrade Dependency Analyzer	59
2	2.2	Landsca	pe Planning	60
		2.2.1	Connected Systems Questions	61
		2.2.2	System Strategy	62
2	2.3	SAP Sol	ution Manager Tools for Establishing Scope	70
		2.3.1	Solution Documentation	70
		2.3.2	Scope and Effort Analyzer	88
2	2.4	Resourc	e Planning	105
		2.4.1	Project Team	106
		2.4.2	Training Plan	110
2	2.5	SAP Bes	t Practices	114
2	.6	Summar	у	117

3	Infrastructure Planning					
	3.1	Enqueue Server				
	3.2	Dual Stack Split 125				
	3.3	Sizing				
		3.3.1 Ballpark Sizing 140				
		3.3.2 SAP Sizing Report for SAP Business Suite on SAP HANA 147				
		3.3.3 SAP Quick Sizer 144				
	3.4	Backup and Recovery 150				
		3.4.1 Backups 15'				
		3.4.2 Recovery 155				
	3.5	Summary 16				

#### Security Planning ...... 163 Δ

4.1	Risk-Bas	sed Approach	164
4.2	Initial Se	ecurity Implementation	165
	4.2.1	Infrastructure Security	166
	4.2.2	Security Configuration	167
	4.2.3	Encryption	
4.3	Applicat	tion Security	
	4.3.1	Common ABAP Vulnerabilities	171
	4.3.2	Recommendations for Managing Application Security	173
4.4	User Sec	curity	173
	4.4.1	Access Control	173
	4.4.2	Authentication	178
	4.4.3	Endpoint Security	180
4.5	Ongoing	g Security Management	181
	4.5.1	Vulnerability and Patch Management	181
	4.5.2	Tracking and Monitoring Security Activity	
4.6	Summar	ſy	183

#### PART II Migration

5	5 Migration Tools and Options					
	5.1	Migratio	on Tools	188		
		5.1.1	Maintenance Optimizer	189		
		5.1.2	Maintenance Planner	203		
		5.1.3	Software Update Manager	210		
		5.1.4	Software Provisioning Manager	225		

|--|

	5.1.5	Benchmark Migration	237
		Table Comparison	
	5.1.0	•	
	5.1.7	Generating a Migration Key	257
5.2	Migratio	on Options	260
	5.2.1	Software Update Manager with Database	
		Migration Option	261
	5.2.2	Update with Software Update Manager and then	
		Migrate with Software Provisioning Manager	265
5.3	Summar	y	269

# 

6.1	Prerequisites	271
6.2	Executing the Software Update Manager with Database	
	Migration Option	272
6.3	Postprocessing	295
6.4	Troubleshooting and Tips	305
6.5	Summary	307

### 

7.1	Prerequ	isites	310
	7.1.1	Preparing the Source System	311
	7.1.2	Preparing the Target System	322
7.2	Prepara	tion	324
	7.2.1	Export Preparation	325
	7.2.2	Table Splitting Preparation	328
7.3	Executio	on	331
	7.3.1	Database Export: Source System	332
	7.3.2	System Import: Target System	345
7.4	Trouble	shooting	366
7.5	Summai	ry	367

#### PART III Go-Live

6

7

8	Test	and Ch	ange Management Strategy	371
	8.1	Regress	ion Test Strategy	372
		-	Software Provisioning Manager	
		8.1.2	Software Update Manager	377

8.2	SAP Sol	ution Manager Business Process Change Analysis	377
	8.2.1	Prerequisites	378
	8.2.2	•	393
8.3	SAP Sol	ution Manager Testing Tools	395
	8.3.1	Test Option 1: Test Workbench	396
	8.3.2	Test Option 1: Test Automation Framework	408
	8.3.3	Test Option 2: Integration between HP Application	
		Lifecycle Management and SAP Solution Manager	412
	8.3.4	Test Option 3: IBM Rational	415
8.4	Change	Management with SAP Solution Manager	417
	8.4.1	Change Request Management	418
	8.4.2	Quality Gate Management	422
	8.4.3	Retrofit	424
8.5	Summar	ŷ	428

## 9 Proactive Monitoring .....

-	 -	 	-	

... 431

9.1	SAP HANA Studio 432
9.2	SAP HANA Cockpit 440
9.3	SAP Database Control Center 447
9.4	SAP Solution Manager Technical Operations
	9.4.1 Accessing Technical Monitoring 453
	9.4.2 Accessing SAP EarlyWatch Reports 460
9.5	SAP Database Administration Cockpit 462
9.6	Summary

#### 

10.1	Building	Cutover Plans	470
	10.1.1	Migration Tasks	471
	10.1.2	Rollback Plan	473
	10.1.3	Communication Plan	474
	10.1.4	Planning for Business Downtime	476
10.2	Cutover	Support Resources	477
	10.2.1	SAP Enterprise Support Services	478
10.3	Summar	<i>y</i>	481

#### PART IV Optimizations

ABAF	9 Optimizations 48	5
	Noncompliant Code	
	11.1.1 Finding SELECT without ORDER BY 48	36
	11.1.2 Finding Native SQL Statements 49	<i>)</i> 2
11.2	Optimization Opportunities 49	
	11.2.1 Workload Monitor 49	96
	11.2.2 SAP Workload Analysis 49	99
	11.2.3 Database Administration Cockpit 50	)2
11.3	Summary 50	)3

#### 

12.1	Technic	al Check	506
		nal Enhancements	
	12.2.1	Finance	511
	12.2.2	Materials Management	512
	12.2.3	Sales and Distribution	515
12.3	Enhance	ement Discovery	516
12.4	Summa	ry	518

## 

13.1	Why SA	P S/4HANA Finance?	522
		ments	
	13.2.1	Functional Requirements	525
	13.2.2	Technical Prerequisites	526
13.3	Installat	tion	529
	13.3.1	Maintenance Planner	529
	13.3.2	Running Software Update Manager	534
13.4	Summa	ry	545

# 

14.1	Installin	g SAP HANA Live Content	549
	14.1.1	Prerequisites	550
	14.1.2	Installation	554
	14.1.3	Validating Installation	557

Contents

Contents

14.2	SAP HANA Live Explorer	559
14.3	SAP HANA Live Authorization Assistant	561
14.4	SAP HANA Live Extension Assistant	564
14.5	Summary	567

Α			п		5
	 24		U	-	 e.

# 569

А	Project Documents			
	A.1 Project Charter			
		A.1.1 Project Overview 57		
		A.1.2 Project Scope 57	3	
A.2 Communication Plan				
	A.3	Risk Plan	0	
	A.4	Cutover Plan	1	
В	Glossary The Author			
С				
Inde	exx		9	

# Index

#### Α

ABAP, 172, 311, 485, 583 add-ons, 46, 49, 51, 280 application server, 24, 310 applications, 175 components, 533 objects, 378 security roles, 419 system, 136 system profile, 59 ABAP AS, 148, 583 ABAP Database Connectivity (ADBC), 495 ABAP Dictionary, 506 ABAP List Viewer (ALV), 486, 499 ABAP Program BTCTRNS1, 287 ABAP SAP Central Services, 36 Access control, 173 Accounts Payable/Accounts Receivable (AP/ AR), 525 ACDOCA, 522 ACID, 28 Additive sizing, 310 Alerts, 436, 441 email, 436 Application code, 375, 486 Application layer, 262, 376 Application Lifecycle Management (ALM), 395 Application regression tests, 61 Application server, 307, 332, 364, 537 operating system (OS), 48 Application Specific Upgrade Toolbox (ASU Toolbox), 284, 540 Applications for FIN 700, 195 Asset Accounting (AA), 522, 525 Audit controls, 163 Auditing, 183 Authentication, 179

#### В

Background job, 22, 58, 142 Background process, 218 Backup, 120, 150-151, 153, 159, 307, 431 execution, 446 history analysis, 446 strategy, 151, 155 BASH shell, 345 BDC Sessions, 317 Benchmark tool, 188, 237, 242–243, 245, 263 Bills of material (BOM), 165 Blueprint Generation, 84 BRTOOLS, 220 BTCTRNS1, 320, 540 BTCTRNS2, 303, 540 Business Add-Ins (BAdIs), 163 **Business Application Programming Interfaces** (BAPIs), 163, 173 Business blueprint, 583 Business process blueprint, 378 Business Process Change Analyzer (BPCA), 41, 88, 110, 371, 374, 377–378, 393, 414, 416, 428, 519, 583 Business Process Monitoring (BPMON), 462 Business Process Repository, 70

#### С

Change and Transport System (CTS), 420 Change document, 418 Change management, 371 Change Recording and Replication (CRR), 218 Change Request Management (ChaRM), 67, 372, 417–420, 422, 424, 583 CHECKS.LOG, 274 CHECKS.TXT, 274, 280, 283, 286, 288, 291, 536, 541 Checksum, 256 Classical migration, 309 Client directory, 555 Cluster table, 312, 486 Code Inspector, 173 Code Vulnerability Analyzer (CVA), 173 Cold storage, 158 CommonCryptoLib, 170 Communication plan, 471, 474, 578 Compatibility views, 522 Component-Based Test Automation (CBTA), 408 Controlling (CO), 522 Cron, 155, 287 Cross System Object Locking (CSOL), 424, 426.429 CSV file. 183. 367 Custom code, 485 Custom Code Management, 385 Custom development, 375 Custom objects, 488 Cutover, 473 Cutover plan, 469-470, 481, 581 Cutover procedure, 156 Cutover testing, 61 Cyclical Redundancy Check (CRC), 254

#### D

Data Definition Language (DDL), 321 statements, 351 Data Dictionary (DDIC), 63, 273, 320, 358 Database Administration Cockpit (DBA Cockpit), 155, 168, 179, 242, 349, 432, 454, 462, 583 Database calls, 262 Database export, 345 Database Migration Option (DMO), 210, 261, 583 Database parameters, 480 Database table, 182 Delta queues, 318 Demilitarized Zone (DMZ), 166 Design-time object, 175 dev\_SAPup, 223 Development Workbench, 63 Diagnostic agent, 358 Disaster Recovery (DR), 32, 583 Disaster Recovery and High Availability (HA/ DR), 33

Domain Name Server (DNS), 346 Downtime, 511, 583 Dual stack, 125, 583 *split*, 125 *system*, 119 Dynamic Controller of the Import Migration Monitor, 234 Dynamic TBOM, 378, 415

#### Ε

Employee Self-Service (ESS), 189 Encryption, 169 Endpoint security, 180 Enhancement Package, 23, 40, 195, 275, 393, 505, 583 Enqueue Replication Server (ERS), 36, 166, 583 Enqueue server, 119–121 Enqueue service, 583 ERPScan, 181 EXEC SQL, 493 Expert Guided Implementations (EGI), 452-453 Expert mode, 216, 282 Export directory, 325–326, 331 Export Monitor, 340 export\_monitor\_cmd.properties, 340 Extractor Framework (EFWK), 386

#### F

Failover node, 234 File Transport Protocol (FTP), 234, 267, 349 Firewall, 166 Five-system landscape, 62, 64 Four-system landscape, 62, 65 Full Qualified Domain Name (FQDN), 346

#### G

Gateway Monitor, 376 General Ledger (GL), 522, 525 global.ini, 182 GoingLive analysis, 146 GoingLive Check, 478 GoingLive Support, 481 Graphical User Interfaces (GUI), 583

#### Н

HANA Lifecycle Manager, 447 Hardening process, 167 Hardware utilization, 479 HDB\_MASSIMPORT, 345 High Availability, 32, 35, 120, 583 HIPAA, 165 HP ALM, 112, 412, 428 *Defect Management (DM)*, 413 HP ALM QC, 413–414 HP QuickTest Professional (HP QTP), 409– 410, 412, 414 HP Unified Functional Testing (UFT), 409

IBM Rational, 395, 415-416, 428 RequisitePro, 416 IBM Test Director, 112 ICF (Internet Communication Framework), 166.584 IDoc tables, 247 Implementation Master Guide (IMG), 525 Import parameters, 351 indexserver.ini, 167 Infrastructure as a service, 29 Infrastructure security, 166 initserver.ini, 179 In-memory database, 150, 572 In-memory database management systems (IMDBMS), 584 Innovation Discovery, 517 Instance profile, 121 Internet Communication Manager, 120 Internet Graphics Service, 120 IT Service Management (ITSM), 110, 397, 417, 452 solution, 454 tool. 422 ITIL, 417, 422, 429

Java Database Connectivity, 29 Java export, 130 Java stack, 125, 127, 138 Java system, 138 JSON (JavaScript Object Notation), 584

#### Κ

Kernel switch, 289 Key performance indicator (KPI), 438, 456

#### L

Landscape Management Database (LMDB), 193, 202–203, 269 report, 202 Landscape planning, 39, 60, 70 Landscape strategy, 62 License key, 277 LOG\_MM\_OPT\_POH, 512 LOG\_MM\_OPTIMIZATIONS, 512 LOG\_PPH\_MDPSX\_READ, 512 LOG\_SD\_REPORT\_OPT, 516 LogAnalyzer.html, 342

#### Μ

Maintenance Agreement, 470, 572 Maintenance Optimizer, 42, 94, 188–189, 193, 201, 240, 272, 528, 584 Maintenance Planner, 188, 203–204, 240, 269, 272, 521, 528–529, 584 Master Data Governance (MDG), 189, 470 Master password, 346 Material requirements planning (MRP), 22, 573, 584 Materials Ledger (ML), 525 Materials Management (MM), 506 Materials requirements planning (MRP), 472, 512 MDX, 29 Microsoft Management Console (MMC), 138 Migration key, 239, 257, 260, 272–273 Migration Monitor (migmon), 234–235, 268, 332, 340, 354 Migration procedures, 61 Migration task list, 470 Migration Time Utility, 234 Monitoring, 431 MRP Live, 22 Multidimensional expressions, 548 Multidisplay/Multiprocessing, 52 Multiple Components One Database (MCOD), 536 Multitenant database containers, 266

#### Ν

N-1 strategy, 42, 96 Native SQL, 485, 492–495 Near Zero Downtime (nZDM), 216–218, 476, 584 Network File System (NFS), 234, 267, 326

#### 0

OLE DB for OLAP, 29 Onapsis, 181 Online analytical processing (OLAP), 22, 30, 547, 584 Online transaction processing (OLTP), 22, 26, 547, 584 Open Database Connectivity, 29 Open SQL, 485, 494, 584 OpenSSL, 170 ORDER BY, 486 OS/DB migration, 309 OS/DB Migration Check, 481

#### Ρ

Package Splitter, 268 Payment Card Industry Data Security Standard (PCI DSS), 169 Performance metrics, 433 Pink Elephant ITIL Certified, 418 Plant Maintenance (PM), 574

Pool tables, 312, 314, 486
Primary application server (PAS), 32, 119, 121, 139, 211, 213, 228, 231, 237, 249, 272–273, 276, 288, 291, 309, 325, 329, 345, 534, 584
Private views, 547
Privileges, 174
Product Availability Matrix (PAM), 46, 550
Product Support for Large Enterprises (PSLE), 71, 409
Production environment, 62
Production Planning (PP), 573
Project charter, 571
Project scope, 260
Project Systems (PS), 165

#### Q

QA landscape, 139 QA refresh, 157 QA system, 63–64, 67–68 Quality Gate Management (QGM), 67, 372, 417, 422–424, 584 Query views, 547, 563 Quick Sizer, 144, 146, 148, 150, 584

#### R

R3ldctl. 230. 268 R3Load, 230, 235, 268, 342 R3szchk. 230 R3ta. 230. 268 Ramp-up Knowledge Transfer (RKT), 112, 452-453 Rapid Database Migration, 116 Rapid Deployment Solution (RDS), 114-115, 118, 558, 576, 584 Real-time replication, 25 Recovery, 120, 150, 155 Recovery point objective (RPO), 34, 150, 584 Recovery time objective (RTO), 34, 584 Red Hat Enterprise Linux, 26 Regression test, 374, 378, 398, 472 scope, 376 strategy, 373 Regression test cycle, 68

Relational Database Management System (RDBMS), 29, 31, 424, 584 Release level, 67 Remote function call (RFC), 86, 376, 424, 496 status. 384 Report SDBI POOL CHECK, 314 Repository object, 372 Representational State Transfer (REST), 584 Resource Planning, 105 Retrofit, 67, 424, 426, 429 objects, 427 tool, 372, 420 Reuse views, 547 **Reverse Business Process Documentation** (RBPD), 71 Risk assessment, 165 Risk identification. 107 Risk plan, 373, 580 Risk planning, 180 Risk-based approach, 164, 262 Rollback, 68 Rollback plan, 471, 473 Root Cause Analysis, 453 Root Encryption Key, 168 Runtime license, 25 Runtime object, 175

#### S

SAINT (SAP Add-On Installation Tool), 273 Sales and Distribution (SD), 402, 515 SAP Accounting, 524 SAP Active Global Support, 106 SAP Adapter, 412 SAP Adapter for HP Quality Center (HP QC), 412.416 SAP Application Performance Standard (SAPS), 139 SAP Best Practices, 40, 107, 114, 171, 280 SAP Business Explorer (BEx), 521 SAP Business Warehouse (SAP BW), 26, 318, 385, 470, 472, 526 SAP Business Workflow. 397 tables, 247 SAP BusinessObjects, 548 SAP BW Accelerator. 30 SAP BW in SAP Solution Manager, 387

SAP Cash Management, 524 SAP Central Operations Concept, 452 SAP Code Inspector, 495, 503 SAP Code Vulnerability Assessment (CVA), 171 SAP Community Network (SCN), 26, 187, 307, 515 SAP Cryptographic Library, 132 SAP Customer Relationship Management (SAP CRM), 59, 61, 65, 165, 408 UI. 419 SAP Database Control Center (DCC), 155, 431, 447-448.458 SAP Download Manager, 534 SAP EarlyWatch Check, 460, 462 SAP EarlyWatch Report, 71, 77, 95, 190, 204, 432, 453, 456, 460, 481, 583 SAP ECC, 477, 511 SAP Enterprise Maintenance Agreement, 397, 429 SAP Enterprise Portal, 408, 454, 472 SAP Enterprise Support, 146, 378, 409, 459 SAP Enterprise Support Agreement, 408, 426 SAP Enterprise Support Services, 478 SAP ERP 6.0 EHP 7, 50 SAP ERP ABAP AS. 345 SAP ERP Financials(FI), 23, 247, 506, 521, 573 SAP ERP Human Capital Management (HCM), 165 SAP ERP version, 41 SAP Financial Closing Cockpit, 574 SAP Fiori, 29, 196, 408, 440, 449, 505, 521-522, 548, 559, 584 SAP Fiori 2.0 for SAP S/4HANA Finance. 546 SAP Fiori Smart Business Apps, 25 SAP Fortify, 173 SAP Gateway, 524, 546 SAP Global Trade Services (GTS), 470 SAP GoingLive Support, 470, 478 SAP Governance, Risk, and Compliance (GRC), 97, 189 SAP GUI, 258, 379, 398, 472, 521 SAP HANA Application Lifecycle Management. 554 SAP HANA Cockpit, 431, 440, 445, 447, 450, 458 SAP HANA Enterprise, 141 SAP HANA Enterprise Cloud, 29, 368

SAP HANA kernel. 208 SAP HANA Live, 22, 24, 28, 524, 545, 547-548, 573, 585 architecture. 548 Authorization Assistant, 547, 552, 561 browser, 552 content, 549 Explorer, 559 Extensibility Assistant, 549, 552 Extensibility Tool, 565 Extension Assistant, 564 installation. 558 tools. 555 SAP HANA Memory Sizing Report, 141 SAP HANA Studio, 152, 157, 440, 446–447, 557.563 SAP Host Agent, 211, 213, 228, 254, 272, 528 SAP Innovation Discovery Tool, 517 SAP KERNEL, 231 SAP Kernel versions, 48 SAP Landscape Transformation (SLT), 23, 585 SAP Lumira, 22, 548, 561, 567, 573 SAP Master Data Management (MDM), 97 SAP MaxAttention, 71, 409, 585 Agreement, 378 SAP Mobile Platform, 459 SAP Mobile Secure, 459 SAP NetWeaver, 36, 109, 113, 120, 151, 195. 260, 310, 345-346, 374 SAP NetWeaver (Basis), 109, 477 SAP NetWeaver AS ABAP, 163, 166 SAP NetWeaver AS ABAP 7.4, 50 SAP NetWeaver AS Java, 163, 167 SAP OS/DB Migration Check, 470, 478 SAP Patch Manager (SPAM), 273, 534 SAP Process Integration (SAP PI), 59, 61, 65, 455.470.472 SAP Process Orchestration (PO), 456 SAP S/4HANA. 26 SAP S/4HANA Finance, 27, 37, 207, 511, 521, 568, 576, 585 SAP S/4HANA Logistics, 27 SAP Screen Personas, 196, 506, 585 SAP Service Marketplace, 150, 204 SAP Services Partner, 107 SAP Smart Business 2.0 for SAP S/4HANA Finance, 546

SAP Smart Business Applications, 568 SAP Software Download Center, 152, 348 SAP Solution Manager, 34, 40, 59, 67, 70, 84, 111, 117, 188, 190, 202, 257, 304, 356, 360, 371, 374, 377–379, 385, 388, 391, 393, 395, 406, 409, 417, 420, 426, 432, 440, 451, 454, 460, 469, 481, 528, 585 ABAP stack. 419 Java stack, 419 SAP StreamWork. 469 SAP Supply Chain Management (SAP SCM), 165, 318 SAP Support, 223 SAP Support Portal, 45, 123, 146, 205, 237, 257, 272-273, 324, 353, 452, 479, 552, 581 SAP Test Acceleration and Optimization (SAP TAO), 409, 412, 414 SAP Workload Analysis, 499 SAPCAR, 213-214, 228, 234 SAPINST, 126, 129, 136, 225, 324, 332, 345 SAPUI5, 271, 505 SAPup\_troubleticket.log, 223 SAPup.log, 223 SAPupchk.log, 223 SAPupStat.log, 291 Sarbanes-Oxley, 165 Savepoint, 151, 585 global, 152 Scale out, 32 Scale up, 32 Scope and Effort Analyzer (SEA), 88-89, 110, 374, 377, 393, 585 Secure Storage in File System, 168 Secure Storage Key Generation, 358 Security, 172 Security Assertion Markup Language (SAML), 179 Security planning, 163 Semi-dynamic TBOM, 378-379, 391 Service Level Agreement (SLA), 162, 447, 452 Shadow instance, 265, 272, 275, 282, 287 Shadow repository, 263 Shadow system, 210 SharePoint, 469 Short Message Service (SMS) alert notifications, 432 SID (System Identifier), 585

Sizing, 139, 144, 311, 480 Sizing requirement, 119 SMIGR CREATE DDL, 333 SMTP. 308 Software Download Center, 211 Software Logistics Common UI (SL Common UI), 211, 214, 219–220, 223, 237–238, 271, 308. 528 Software Logistics Toolset (SL Toolset), 23, 41, 125–126, 187, 211, 260, 266, 269, 272, 308.585 Software Provisioning Manager (SWPM), 41, 53, 121, 125, 129, 187, 225-226, 234, 237, 260, 265, 309, 330, 368, 372, 470, 585 GUI, 235 Software Update Manager (SUM), 23, 41, 52-53, 88, 127, 174, 187, 190, 208, 210, 214, 260, 316, 377, 469, 521, 526, 585 Solution Documentation, 40, 70, 111, 412 Solution Documentation Assistant (SDA), 71, 84, 87, 91, 374, 519, 585 SP Stack (Support Package Stack), 585 SQL files, 333 SQL Monitor, 503 SQL Performance Tuning Worklist, 504 SQL statements, 503 SQLDBC library, 23 SSFS master key, 170 stack.xml, 201, 208, 281, 534 Static TBOM, 378 ST-PI. 141 SUM DMO, 237, 261, 265, 268, 271, 294, 310, 368, 372, 474, 527 SUM UI. 306 Support Package Stack (SP Stack), 23, 39, 44, 61, 109, 188, 207, 272, 372, 378, 388, 452, 510, 528, 530, 573 SUSE Linux. 26 Switch Framework, 42, 415, 510, 512 Syslog, 183 System Landscape Directory (SLD), 98, 304, 356, 360, 453 System log tables, 247 System Monitor, 433 System profiles, 296 System Replication, 33-34, 585 System restore, 473

#### Т

Table comparison tool, 188, 247, 255 Table splitting, 315, 325, 328, 331–332 Tailored data center integration (TDI), 25–26, 108, 585 Target database, 327 Target database version, 348 Target system, 318, 322, 325, 331 Technical bill of materials (TBOM), 378 generation, 390 Technical Monitoring, 453, 455 Technical Operations, 432, 452–453 Technical Prerequisites for Service Delivery, 481 Technical System, 456 Tenant database, 447 Test Automation Framework, 408 Test cycle, 107, 406 Test Management, 395, 397, 412 Test package, 397, 402 Test plan, 371, 402, 406 Test planning tool, 108 Test Tools, 112 Test Workbench, 105, 396 Tester workflow. 402 Tester worklist, 398 Time Analyzer (migtime), 268, 343, 365 Timeout parameter, 490 TP log, 223 Transaction, 40, 374, 400, 491, 505, 511 /n/ASU/UPGRADE, 284 /NSPRO, 545 ABST. 525 ABST2, 525 AISUSER, 190 AR01, 511 CRR\_CONTROL, 218 DB02. 140. 303 DBACOCKPIT, 315, 462, 502, 510 F110, 511 FAGLL03H, 511 FBL1H, 511 FBL3H, 511 FBL5H, 511 GCAC, 525 HDBVIEWS, 508

Transaction (Cont.) KEPM, 511 LMDB, 194, 202 *MB51*, 512 MB52, 512 MB5L, 512 MIDO, 512 *MIGO*. 512 MIRO, 512 MMBE, 512 RSA7, 318 RZ10, 296 RZ70, 304 SA38, 303, 312 SAT, 502 SCI, 486, 492 SE11, 304, 550 SE14, 304, 318 SE16, 53, 507 SE38, 424 SE80, 424 SFW5, 42, 513 SGEN, 303, 586 SICK, 296 SM\_WORKCENTER, 72, 89, 191, 393 SM13, 286, 288, 317 SM36.299 SM37, 58, 322, 514 SM63, 287, 318 SMGW, 316 SMICM. 128 SNOTE, 312 SOLAR01, 86, 378 SOLMAN\_SETUP, 190, 379, 453 SPAU, 65, 282, 293 SPAU\_ENH, 293 SPDD, 65, 282 SPRO, 410, 525 SPUMG, 55 SQLM, 503 ST03N, 145, 496, 512 ST04, 168, 179 ST05, 502 ST12, 502 STAD, 499 STMS, 301 SU10, 320

Transaction (Cont.) SWLT, 504 UCCHECK, 54 V23, 516 VA01, 374, 378 VA05, 516 VA15, 516 VA25, 516 VA45, 516 VF05, 516 VF31, 516 Transparent tables, 312 Transport, 393, 422-423, 426, 482 Transport Management System (TMS), 301, 365, 420 Troubleshooting, 366, 434, 465 Two-factor authentication, 167

#### U

Unicode, 52, 54, 309, 586 status, 52 Universal Journal, 522 Universal Journal  $\rightarrow$  ACDOCA, 522 Unprocessed updates, 317 Upgrade Dependency Analyzer (UDA), 59–60, 586 Uptime, 586 Usage and Procedure Logging (UPL), 91, 378, 385, 390 data collection, 390 extraction, 386 extractors, 388 Usage rights, 378 User Acceptance Test (UAT), 167, 172, 174 User interface enhancements, 505 User Management Engine (UME), 125, 586 User-based sizing, 148

#### ۷

Value Help views, 547 Virtual memory, 31

#### W

Web Application Firewall, 166 Web Dynpro, 384, 388 Web Dynpro Java, 173 Work center, 586 Workload monitor, 496 **X** 

X.509 certificate, 179 XML files, 265









**Michael Pytel** is currently the chief innovation officer and co-founder of NIMBL, an SAP implementations consulting firm. He has more than 14 years of handson technical experience with SAP solutions, including SAP HANA.

Michael Pytel

# Implementing SAP Business Suite on SAP HANA

597 Pages, 2016, \$79.95/€79.95 ISBN 978-1-4932-1257-6

www.sap-press.com/3895

We hope you have enjoyed this reading sample. You may recommend or pass it on to others, but only in its entirety, including all pages. This reading sample and all its parts are protected by copyright law. All usage and exploitation rights are reserved by the author and the publisher.

 $^{\odot}$  2016 by Rheinwerk Publishing, Inc. This reading sample may be distributed free of charge. In no way must the file be altered, or individual pages be removed. The use for any commercial purpose other than promoting the book is strictly prohibited.