## Technical preparations

* Download the required SAP HANA installation files from SAP Marketplace and the supporting guide can be found here [SAP HANA Installation Guide](https://help.sap.com/doc/e9702d76c3284623b02de196c0e79e49/1.0.12/en-US/SAP_HANA_Server_Installation_Guide_en.pdf).
* To proceed with the system copy SWPM should be downloaded in the server beforehand. To download the compatible SWPM Refer to the link : [SWPM Installation Guide](https://help.sap.com/viewer/30839dda13b2485889466316ce5b39e9/CURRENT_VERSION/en-US/6865029dacbe473fadd8eff339bfa568.html)

**Pre-requisites and validation checks**

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| * Process for Provisioning cloud account. | * Asset/Project owner from the SNET team needs to work with Project Sponsor and Migration Lead (Zech, Alexandra <azech@deloitte.com>) to agree on the preferred Cloud Option(AWS/Azure/GCP). * Once finalized, the SNET lead will work with the Project Sponsor to fill the offline Cloud Concierge form. * Cloud Concierge route the request to the right team(iCMS) to host the asset. * SNET Asset Lead have to work with iCMS team to identify the hardware specifications and to provision the AWS/Azure/GCP account along with the resources. |
| * Request access to Elevated group “SG-US-SNET-SAP-Admins” via the MAC tool   (Log in to [Mac Tool](https://mac.us.deloitte.com/home.jsf) using laptop credentials 🡪 Manage Access 🡪 search by SG-US-SNET-SAP-Admins[1] 🡪 Select the option[2] as shown in screenshot and submit. You will receive a mail once it’s been approved) |  |
| * Setting up System Message   (Log in to the system in SAP GUI 🡪 execute SMO2 🡪 Click on create [1] 🡪 Fill the asked details [2] 🡪 Save [3]) |  |
| * Database backup   (Log in to the HANA studio and take backup of the tenant DB) |  |
| * Validating connectivity from Source to target   (Create a dummy text file in Source and transfer the text file to the Target using the mentioned command) | Command : scp -r <folder/file name> <os user>@<target host\_name>:<target location> |
| * Identifying cross System connections   (Before proceeding with migration make note of any system connections present in the landscape. Which can be checked from the system architecture of the project) |  |
| * Transfer of Database backup from source to target | Command : scp -r <folder/file name> <os user>@<target host\_name>:<target location>  Source :    Traget : |
| * Hana installation files   (Download HANA installation components from SAP Marketplace and additional plugins if any are present in Source. HANA Version and SP level should be same or greater than the source as HANA restore is downward compatible) |  |
| * SWPM download into Target server   (Download compatible SWPM from SAP Marketplace and uncar the .SAR file) |  |
| * Check and keep a note of the DDIC 000, SAP\*, SYSTEM, <sid>adm passwords; SCHEMA name & password; |  |
| * Validation of individual user access on target server.   (login to [Thycotic Secret Server](https://uspcs.us.deloitte.com/USPCS/dashboard.aspx#{%22tId%22:13160,%22fId%22:%22-1%22,%22s%22:%22%22,%22inSub%22:false,%22tptId%22:null,%22status%22:%22Active%22}) with Deloitte credentials)  (Select **us.deloitte.com\usa-<useraname>**[1] 🡪 click on View[2])  (Click on the lock icon and the password will show. Verify if access to the server is possible using the given username and password) | j |
| * Validate sapadmin user access   (After logging into thycotic click on the server and the credentials will show. Verify if access to the server is possible using the given username and password) |  |
| * Validation of DNS mapping   (Verify whether the IP is mapped to the correct hostname by logging into the server with IP address and check host name à command **hostname -f**) |  |
| * Validate access to SNET SAP Standard Ports   (Only verify if SWPM is launching as no other services are running on the server.  Go to SWPM location in server🡪execute **./sapinst SAPINST\_REMOTE\_ACCESS\_USER=sapadmin**)  SAP standard ports :  22, 80, 443, 515, 1128 - 1129, 3200 - 3210, 3298 - 3299, 3300 - 3310, 3600 - 3610, 3900 - 3910,  4237 - 4241, 4300 - 4305, 4400 - 4410, 4800, 5900 – 5910, 8080, 8000 - 8010, 8100 - 8110, 8443, 21212 - 21213, 30000 – 31100, 44300 - 44310, 50000 – 51100 |  |
| * Getting the necessary firewall rules updated if there are cross System connections present in the landscape.   (if there are internal system connection present in the landscape, raise firewall request to open the required ports between the servers. Refer to the given document for necessary steps and KB0027609 for required information) | [KB0027609 Firewall: Required information when submitting a firewall request](https://deloitteus.service-now.com/kb_view.do?sysparm_article=KB0027609) | |
| * Validate setup of FS and Mount Points |  |
| * Getting the CMDB CI record created for your Solution/Project   (Refer to the given document for necessary steps) |  |
| * Validate installation of RPM Packages (sapconf, libatomic,insserv, numactl)   (Get the packages installed by SLTC.  execute **rpm -qa | grep <package name>**) |  |
| * Validate Transfer of files from source(on prem)   to target(cloud) |  |
| * Validate if sapadm user exists in /etc/passwd.   (Go to /etc à vi passwd à add the mentioned line if sapadm entry is not present) | Add the line : **sapadm:x:488:79:SAP Local Administrator:/home/sapadm:/bin/false** |

**HANA Installation**

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| * Go to the software location of HANA Installation Files. |  |
| * Start the HANA Installation by executing ./hdblcm |  |
| * Enter selected action index: 1 * Selected indices for installation components: 2,3   (should be same as source system components) |  |
| * Enter SAP HANA System ID, Instance Number   (should be same as source )   * Select System usage: 2   (choose as per the environment) |  |
| * Keep note of summary before starting execution   (all the installation parameters, files selected will be present in the summary) |  |
| * Proceed with the HANA installation |  |
| * HANA Installation is successful |  |

**System copy**

1. **Backup-recovery (Homogeneous system copy)**

In this approach target system is on the same operating system and database system as source system. The system copy is performed by taking backup of the source contents and recovering target with the source backup.

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| * Go to SWPM software location * Launch SWPM using **./sapinst SAPINST\_REMOTE\_ACCESS\_USER=sapadmin** | <https://usawcon00004.us.deloitte.com:4237/sapinst/docs/index.html> |
| * Drop down the Product type node   (Choose as per system platform)   * Select SAP HANA Database>System Copy>Standard System> Based on AS ABAP>Standard System   ( choose according to the source system) |  |
| * Choose Custom Mode   (to manually define the system parameters) |  |
| * SAP SID should be same as source |  |
| * Enter the DNS Domain Name same as Target Server |  |
| * Provide a Master password   (This password will be used for all new user creation) |  |
| * Provide <sid>adm Password. Leave the rest parameters default. |  |
| * Choose Homogeneous System Copy   (if both the source and target have same OS and Database choose Homogeneous System Copy else choose Standard System Copy**)** |  |
| * Give the database installation parameters |  |
| * Provide a password for SYSTEM User   (SYSTEM user password for tenant DB) |  |
| * Download the SAPEXE.SAR, IGSEXE.SAR, IGSHELPER.SAR files from SAP Marketplace. * Push in the target server and provide the same location in the package path. |  |
| * Packages should get detected and verify the status as AVAILABLE. |  |
| * Review and click on NEXT |  |
| * Click on NO   (prerequisites checks can be ignored) |  |
| * Proceed with the mentioned steps if SAP Host Agent Upgrade is required   (This step can be ignored)   * Download SAPHOSTAGENT.SAR 721 from SAP Marketplace and push in the server * Specify the path of SAP Host Agent file |  |
| * Packages should get detected and verify the status as AVAILABLE. |  |
| * Mark the checkbox if liveCache is required.   (SAP liveCache is a database which resides in memory that is used to speed up material planning scenarios in SAP Supply Chain Management) |  |
| * Go with the option where the HANA Client is installed. |  |
| * Browse the location of HANA Client Package files. |  |
| * Packages should get detected and verify the status as AVAILABLE |  |
| * Provide database schema name and password same as Source. |  |
| * Provide Database <sid>adm and Password same as source. Keep rest of the parameters as default. |  |
| * Provide source tenant backup folder location on target. Keep the prefix as it is (if not manually changed during taking the backup). |  |
| * Choose HANA Secure User Store   (hdbuserstore is used to store connection information to SAP HANA systems securely) |  |
| * Both ASCS and PAS instance number should be same as source and Host will be of target. |  |
| * Define manually or procced with the default values.   (port numbers where the services will run. Default values recommended) |  |
| * Specify the number of work processes as per requirement or go with the default values.   (it is always recommended to go with default values) |  |
| * Define webadm password |  |
| * Choose No SLD destination if no SLD destination is present on the server level.   (other option can be selected based on the requirement) |  |
| * Select Do not create Message Server Access Control List and click on Next.   (other option can be selected based on the requirement) |  |
| * Tick the given options if the same is present on source. Unless click on next without selecting.   (options can be selected based on the requirement) |  |
| * Tick the option if only need of setting profile parameters for Highest security. |  |
| * Tick the checkbox if you want to start the system manually   (recommended is not to tick the check box) |  |
| * DDIC password should be same as source. |  |
| * Select Default key if not a productive system. |  |
| * Clean up existing operating system users. |  |
| * Check if the parameters shown in the screen are accurate and proceed with execution.   (keep note of the parameter summary from logs section or the page itself) |  |
| * Execution has started. |  |

1. **Export-import (Heterogeneous system copy)**

In this approach the operating system or database system or both is different in target and source server. System copy is performed by taking export of the source system and importing the same on target using SWPM. Migration is another term for a heterogeneous system copy.

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| **Export**  (Run the SWPM in your source server from swpm software location)  SAP NetWeaver 7.5 (Select applicable SAP Product) à MS SQL Server (applicable database) à System copy à Source system à Standard System à Based on AS Java (applicable product) à Database Instance profile |  |
| * Browser the system profile directory |  |
| * Give DB SID |  |
| * Create a location on the server for storing the Database export and point to that location. |  |
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| * Keep the parameter default. |  |
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| * Review and store the parameter summary and click on next to start the execution. |  |
| * Database export has completed successfully. |  |
| **Import**  (Run the SWPM in your target server from swpm software location)  SAP NetWeaver 7.5 (Select applicable SAP Product) à SAP HANA Database (applicable database) à System copy à Target System àStandard System à Based on AS Java (applicable product) à Database Instance profile |  |
| * Choose Custom Mode   (to manually define the system parameters) |  |
| * SAP SID should be same as source. |  |
| * Enter the DNS Domain Name same as Target Server |  |
| * Provide a Master password   (This password will be used for all new system/os users creation) |  |
| * Provide <sid>adm Password. Leave the rest parameters default |  |
| * Choose Standard System Copy   (if both the source and target have same OS and Database choose Homogeneous System Copy else choose Standard System Copy**)** |  |
| * Give the database installation parameters |  |
| * Summary will be shown for reviewing. |  |
| * Provide password of the system user in system and tenant database. |  |
| * Download the SAPEXE.SAR, IGSEXE.SAR, IGSHELPER.SAR files from SAP Marketplace. * Push in the target server and provide the same location in the package path. |  |
| * Packages should get detected and verify the status as AVAILABLE. |  |
| * Review and click on NEXT. |  |
| * Click on NO   (prerequisites checks can be ignored) |  |
| * Tick the checkbox if SAP Host Agent Upgrade is required   (This can be ignored) |  |
| * Go with the option where the HANA Client is installed. |  |
| * Browse the location of HANA Client Package files. |  |
| * Packages should get detected and verify the status as AVAILABLE. |  |
| * Provide password same as Source. |  |
| * Choose HANA Secure User Store   (hdbuserstore is used to store connection information to SAP HANA systems securely) |  |
| * Review the parameters and proceed. |  |
| * Select continue and proceed. |  |
| * Select Use a parameter file only if there is a requirement of scale-out, create and distribute database tables. |  |
| * Generate Migration key from Service Marketplace.   (Migration key generation is discussed in the next steps)   * Navigate to Migration key option or go to [Migration Keys](https://launchpad.support.sap.com/#/migration/request).   (select the options as applicable) |  |
| * Migration key is successfully requested for installation 0020697570 with migration key 17wgd5M504d01eqteA5x0Aw5 and migration ID None |  |
| * Review the properties. |  |
| * Both ASCS and PAS instance number should be same as source and Host will be of target. |  |
| * Define manually or procced with the default values.   (port numbers where the services will run. Default values recommended) |  |
| * Specify the number of work processes as per requirement or go with the default values.   (it is always recommended to go with default values) |  |
| * Provide password for webadm user. |  |
| * Choose No SLD destination if no SLD destination is present on the server level.   (other option can be selected based on the requirement) |  |
| * Tick the given options if the same is present on source. Unless click on next without selecting.   (options can be selected based on the requirement) |  |
| * Tick the checkbox if you want to start the system manually   (recommended is not to tick the check box) |  |
| * DDIC password should be same as source. |  |
| * Select Default key if not a productive system. |  |
| * Clean up existing operating system users. |  |
| * Check if the parameters shown in the screen are accurate and proceed with execution.   (keep note of the parameter summary from logs section or the page itself) |  |
| * System copy is successfully done. |  |

1. **ATADATA mirror**

In this approach system copy is performed by taking ATADATA mirror Sync of the source .This will be performed by Infrastructure Team.

Issues with ATADATA mirror:

* The hostnames are not properly mapped after the sync under the config files at multiple locations due to which unable to proceed with the post sync activities.
* With ATADATA MOTION/MIRROR approach lot of dependency with SLTC can be seen during the migration due to the OS consistency issues.
* It took 80 hours for the ATADATA MOTION/MIRROR Sync alone which is huge as compared to the backup/restore approach.

So, there will be a dependency on the Infrastructure team for the system copy which can be reduced by backup-recovery or export-import approach. As the infrastructure team will only be responsible of providing the server with required privileges and packages installed.

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| * Perform ATADATA Sync   (Target server will be built by performing an ATADATA mirror Sync of the source . This will be performed by Infrastructure Team.  Make sure to bring down the DB manually on the source server before the sync.) |  |
| * Rename HANA Database   (Login using the thycotic secret server US domain credentials)  (Switch to root : **sudo su -**)  (Go to path /hana/shared/<SID>/hdblcm and run **./hdblcm**)  (select index : **9** for renaming the HANA DB)  (keep rest of the parameters default)  (Proceed with the renaming)  (SAP HANA Database system renamed)  Check whether all the HANA services are up before proceeding with system rename. |  |
| * Rename of Application instance   (Go to SWPM software location 🡪  Launch SWPM using ./sapinst SAPINST\_REMOTE\_ACCESS\_USER=sapadmin)  (Drop down System Rename 🡪 Standard System) | <https://usawcon00001.us.deloitte.com:4237/sapinst/docs/index.html> |
| * Warning can be ignored and click on Ok to proceed |  |
| * Give the new system id. |  |
| * Click on NO and proceed. |  |
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| * Modify/Change HANA Database Parameters as per requirement or left them default. |  |
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| * Select Default key option and proceed. |  |
| * Domain name should be of target server. |  |
| * Tick the checkbox if want to keep the existing license or else proceed. |  |
| * Tick the option if you want to procced with installing license key during this process. |  |
| * Proceed without selecting or cleaning up operating system users. |  |
| * Provide the HANA database details. |  |

**Post steps**

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| * SICK   (check for any errors) |  |
| * SGEN   (Run the backup job for SGEN and select the options as mentioned in the screenshot)  (Select the job as shown in the screenshot[1] and schedule it[2]) |  |
| (Verify the status of the job in SM37. The job ideally longer time depending on the size of the system) |  |
| * SLICENSE   (Generate the license from SAP Market Place:  <https://launchpad.support.sap.com/#/licensekey/wizard> )  (SAP system license)  (HANA License)  (license installation on SAP System  SLICENSEàclick on new licenseà Select the license from local desktop and upload)  (license installation on HANA database  Login to system on hana studio à Properties à license à Install License key à Select from local desktop and upload) |  |
| * RZ10   (Import Profiles à RZ10 à Utilities à Import Profiles à of Active Servers)  (Define HTTP, HTTPS,SMTP port parameters in RZ10 same as source. Make sure to restart to get the changes effected) |  |
| * SM59   (Reconfigure Trusted RFC on both BES and FES. Change the target host and instance number of the self RFCs) |  |
| * STC01   (Validate Fiori Launchpad and Fiori Applications. Run the task lists as mentioned in the screenshots) |  |
| * STMS   (STMS, automatically creates TR domain.  Create VIR in system overview go to route standard configuration à select DEV prod option  DEV - SID  PROD – VIR  àdistribute and activate)  (Save virtual system and back to STMS main page)  (Go to Transport routes  Display change mode à F5)  (Save the configuration) |  |
| * Verify if SAP standard ports and router ports are open by running the mentioned command in command prompt.   Standard SAP ports:  22, 80, 443, 515, 1128 - 1129, 3200 - 3210, 3298 - 3299, 3300 - 3310, 3600 - 3610, 3900 - 3910,  4237 - 4241, 4300 - 4305, 4400 - 4410, 4800, 5900 – 5910, 8080, 8000 - 8010, 8100 - 8110, 8443, 21212 - 21213, 30000 – 31100, 44300 - 44310, 50000 – 51100  SAP Router Ports :  3200-3299,3389,22,80,443,8443,30015-39915,50013-59913,8000-8099,5601  (if router connections are failing, request infrastructure team to add the mentioned lines in router server) | Command : telnet <host> <port>      Line : **<ip address of the server> <host name without domain> <FQDN>**  Location on router server : **C:\Windows\System32\drivers\etc\hosts** |
| * STRUST   (Generate new certificate for the server through venafi. The steps are provided in the document **Venafi\_Process**)  (Install the certificate in STRUST. Refer the document **SSL Certificate installation** for detailed process) |  |
| * SE06   (should be selected as standard installation) |  |
| * Implementation of Digitally Signed SNOTE   (Run the report **RCWB\_TCI\_DIGITSIGN\_AUTOMATION** and perform the configuration steps. Once done, the status shows as Completed) |  |
| * SCC4   (Select the option-Changes with Automatic Recording. No transports allowed) |  |
| * Validate End User Access and UserStats T-codes   (Verify ZCHILD, Z\_CONS\_USERS\_STAT and other userstats specific T-codes are working) |  |
| * Take full DB Backup   (Select the system à Backup & RecoveryàBackup Tenant & System Database) |  |
| * Transfer copy of cofiles, data and buffer folders of the source onto the target (Naming convention of folders: data\_old, cofiles\_old, buffer\_old) |  |
| * Define Default System Client in RZ10.   (Create parameter **login/system\_client** in Dialog instance and give the value as Working Client) |  |
| * Maintain a record of the current file system and clean up all unwanted files. |  |
| * Set log mode to overwrite in HANA   (Configuration à global.ini àpersistenceàlog\_modeà  Change it to OverwriteàSave) |  |
| * Decomission Source system.   (Verify if the data is same in source and target and proceed with shutting down the source system from OS level)   * Raise a Jira request for decommissioning the source server   (Make sure you are including all the required information as per the [KB0039344](https://deloitteus.service-now.com/kb_view.do?sysparm_article=KB0039344) when submitting a decommission request in JIRA.)    (submit the request under the Jira project mentioning the server details and select operational area as Server Decomission. You will be receiving one mail for approving the decommissioning. Approve that) | Approval mail: |