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Installing AS ABAP 752 dev. edition on linux: Oracle Virtual Box

So, you want to install a developer edition of a SAP NetWeaver ABAP AS. It should sit on a Linux distribution, in a virtual box.
However, you’re a Linux newbie.
FEAR NOT! It’s not rocket science!
We have created a genuine, step-by-step guide, with loads of screenshots to help you on your way.

A. PREPARATION

1. Ensure you have the following hardware:
   - x86_64 Processor based hardware
   - Required: at least 4 GB RAM plus about 8 GB swap space;
   - Recommended: at least 8 GB RAM plus about 8 GB swap space;
   - About 100 GB free disk space for server installation
   - About 2 GB free disk space for client installation
   - **English** – SAP AS ABAP requires that you configure English (LANG=en_US.UTF-8) as the operating system language

2. Download the latest released version of Oracle VirtualBox from: [https://www.virtualbox.org/wiki/Downloads](https://www.virtualbox.org/wiki/Downloads) for your operating system.

3. Download openSUSE Leap 42.3 in your local machine (64 bit, released version) from: [https://software.opensuse.org/distributions/leap](https://software.opensuse.org/distributions/leap)


   **Note 1**: If the path is too long, the extraction process will not work correctly.

   **Note 2**: Do no extract more than 5 files at once.

   **Note 3**: We have compressed the install.sh script into separate install.rar files, to maintain the script’s executable permissions.
B. CREATE VIRTUALBOX INSTANCE; INSTALL OPEN SUSE

1) Start Oracle VirtualBox and create a new VirtualBox instance by clicking New:

2) Enter the following values, then choose Create:
   - Name: 752_download_generic_image (for example)
   - Type: Linux
   - Version: openSUSE (64 bit)
   - Select Memory size: 6 GB

3) In the dialog that appears, enter the following, then create the virtual machine by choosing Create:
   - Hard disk: Create a virtual hard disk now
   - Storage on physical hard disk: Dynamically allocated -> Next
   - File location and size: 100 GB
4) Again in the VirtualBox Manager, click on **Start** to start the VirtualBox:

![VirtualBox Manager](image1)

5) In the dialog that appears, navigate to the downloaded openSuse installation file (format .iso), which you downloaded in Step 2, eg `openSUSE-Leap-42.3`. Then select this drive.

Click on **Start**

6) Now choose **Installation** (using keyboard, not mouse):

![Installation dialog](image2)

   a) **Important**: Choose language and keyboard layout (test keyboard).
      
      NOTE: We have only tested the US English-language version. If you have problems, please use the English version. In case of a different keyport layout, please select yours.

   ![Language settings](image3)

   b) Read and accept the License Agreement by choosing **Next**.

7) In **Suggested Partitioning** click on Edit Proposal Settings

   - In Suggested Partitioning, choose Edit Proposal Settings and enter the following:
   - File System for Root partition: choose Ext4 from the drop-down box.
   - Uncheck Propose Separate Home Partition
      
      (This step is needed so that SUSE installation creates only one drive but does not create 2 drives (Home and Extension) where Home has less space to continue the ABAP installation.)

   ![Partitioning settings](image4)

   a) Choose **Ok** -> **Next**
   b) Select Region and Timezone -> **Next**
   c) In **Desktop Selection**, choose GNOME desktop -> **Next**
   d) Enter:
      
      - Your full name
- (Create a) user name

Create a master password, confirm it -> Next

(I ticked Use this password for system administrator and Automatic Login. Leave the authentication method and encryption method as they are. The password should be at least 7 characters.)

- Create New User
  - User's Full Name
  - John Doe
  - Username
  - abaptrial
  - Password
  - Password Confirmation
  - Use this password for system administrator
  - Automatic Login

- Skip User Creation

8) **IMPORTANT:** In Installation Settings, do not choose Install yet!

9) You need to make the following settings:

- Scroll down to find Firewall and SSH:
- Disable Firewall
- Enable SSH service:

**Firewall and SSH**
- Firewall will be disabled (enable)
- SSH service will be enabled (disable)

10) Click on Install and Confirm again to Install the Operating System.

**The Linux operating system will install**

*So far so good. Time to take a coffee...*

After installation you’ll be informed that there are updates available. I decided to update and reboot.:
C. PREPARE OPENSUSE SYSTEM FOR ABAP INSTALLATION

In this section, we will make some settings in the openSUSE system to prepare it for the ABAP installation:

- change proxy settings;
- download and extract the ABAP .rar files;
- install the uuidd daemon;
- edit the hostname and hosts files;
- assign root privileges to the install script.

1. If you have successfully installed the openSUSE operating system, you will see something like this:

2. Boot up the system by choosing the first option, “Boot from Hard Disk.” Now, we just have these settings before we install the ABAP server.

Change the Proxy settings, if you are behind a proxy:

3. Open Activities and enter “N” as the search term.

   The system returns something like this:

   a) Choose Network.

      In the dialog that opens, choose Network Proxy, then choose Manual.
b) Change the http and https proxy settings according to your company requirements and set the port to 8080:

![Proxy settings](image)

4. Now we want check used memory using a tool called **Terminal**.

   (Background note: Technically speaking, we are interacting with the **shell**, a program that passes keyboard commands to the operating system. We are interacting with the shell using a **terminal emulator**, called **Terminal**).

   a) Again, choose **Activities**, then enter “**X**” as the search term.

   b) Choose **Terminal**.

   c) Check used memory by typing `df -h`:

   ![df command output](image)

   Minimum space in home directory should be at least 90 GB to avoid memory errors during installation. (In this example, mine is 92G, or 5%.)

**Access the .rar files from Linux**

5. The Linux system needs to access the Windows folder where your .rar files are stored. Therefore, we need to register it for **auto-mount**.

6. **IMPORTANT**: Make sure your Linux system is up and running.

   a) In VirtualBox Manager, select your Linux system, then choose **Settings**:
b) Then choose **Shared Folders**.

c) Add a new folder to automount, by choosing the plus icon to the right:

![Image of Shared Folders](image)

d) In the dialog that appears, navigate to the folder that contains the ABAP installation, `s4installer`.

e) Change the folder name to `s4installer`. (You will need to enter this folder name manually later, so using this alias is less error-prone than trying to remember the complete path.):

![Image of folder with name](image)

f) Choose **OK**.

7) **IMPORTANT**: Reboot the Linux system.

Prepare for and install the uuidd daemon

Now we are going to change some settings, before installing the **uuidd** daemon. This daemon provides universal unique identifiers – essential for creating database keys. (See SAP Note [1310037](https:// Note 1310037 for more details.)

Note: You only need to do this step if you are using a proxy.

a) Open the system tool **YaST** (choose Activities -> enter “Y” as search term...).

b) Enter your root password (ie the one you use to log on to the Linux system.)

c) On the left, choose **Software**.

d) Scroll down on the right-hand side and choose **Network services >Proxy**:
e) Change the HTTP proxy URL to http://proxy<server>: port, tick Use same for all:

f) Choose OK.

8. Log out, then log in again; reopen YaST.
   a. Then test the proxy, using "Test Proxy Settings":
      
   g) Choose OK, OK.

9) Now we are going to install the uidd daemon: Still in YaST, scroll back up and select Online Update.

10) After online update is completed, open the Search tab, and and enter the search term “uidd”, then choose Search.
   a) Choose “uidd” by ticking the checkbox, then choose Accept:

   b) YaST will install uidd.
c) Now reboot when prompted.

11) Now we are going to install a basic text editor, **nano**:

   a) Open **YaST** again.
      
      Again, open the **Search** tab. This time, enter the search term “**nano**”, then choose **Search**.

   b) Select “**nano**”, then choose **Accept**.
      
      YaST will install **nano**.

12) Now we are going to start the **uuidd** service in **Terminal**:

   a) Open **Terminal**.

   b) Start **uuidd**, by entering: **sudo service uuidd start**

   c) Enter the root’s password.
      
      (Note: sudo = “superuser do” ie you need to be a superuser to execute this command. Thus you also have enter the root’s password.)

   d) Check if the service has started by entering: **sudo service --status-all | grep uuidd**

   e) Your **Terminal** will look like this:

      ![Terminal screenshot](image)

13) We also need to check that **libaio** or **libaio1** is installed on your Linux system. In **Terminal**, enter the command **rpm -qa | grep libaio**. The system should return your libaio library and version no:

   **libaio1 1-0.3.109-22.3x86_64** (or similar).

**Edit the hostname and hosts files**

14) Still in **Terminal**, we will **change the hostname**, by entering **sudo nano /etc/hostname**.

   a) Delete the name that is there and replace it with vhcalnpclci.
      
      **IMPORTANT**: Do not rename the server after installation. This feature has been removed from this developer edition for simplicity’s sake.

   b) It should look something like this:

      ![Hostname change](image)

   c) Save your changes by choosing **Ctrl+o**, then **Enter**.
d) Quit the editor by choosing Ctrl+x.

e) Check by entering `sudo cat /etc/hostname`

f) Restart network by entering: `sudo rcnetwork restart`

g) Check that the hostname has changed by entering `hostname`

15) Now we will **map the IP address** to the new hostname:

16) Check the IP address by entering `sudo ifconfig`

   a) Open the `hosts` file by entering `sudo nano /etc/hosts`

   b) Using this IP address, add a new entry of the form:
      `<IP address> <short hostname> <fully-qualified hostname>`
      (Should be: `10.0.2.15 vhcalnplci vhcalnplci.dummy.nodomain`):

   c) Again, save your changes by choosing Ctrl+o, then Enter.

   d) Quit the editor by choosing Ctrl+x.

   e) Check the changes by using the command `sudo cat /etc/hosts`

**Assign root privileges**

17) And now...(last step before we install), we will **assign root privileges**, by entering `sudo -i`

   a) Enter the root’s password and navigate to the shared folder with the ABAP installation:
      `cd /media/sf_s4installer`

   b) Change the access rights of the install script: `chmod +x install.sh`

**D. INSTALL THE AS ABAP SERVER**

FINALLY, we run the installation, by entering the command `.install.sh`

1. Read and accept the license agreement

2. When prompted for the OS users password enter your master password of the virtual Linux OS instance twice

3. Be patient, this will take a while...
4. If the installation is successful, you will see something like this:

<table>
<thead>
<tr>
<th>Checking sys Database</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database is running</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Starting Startup Agent sapstartsrv</td>
</tr>
<tr>
<td>OK</td>
</tr>
<tr>
<td>Instance Service on host vhslinicl started</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>starting SAP Instance ASCS61</th>
</tr>
</thead>
<tbody>
<tr>
<td>Startup Log is written to /home/vhslinicl/startup ASCS61.log</td>
</tr>
</tbody>
</table>

| /usr/sap/NL/ASCS61/exe/startcontrol -prot NL_HTTP -mr 01 -function Start |
| Instance on host vhslinicl started |
| Starting Startup Agent sapstartsrv |
| OK |
| Instance Service on host vhslinicl started |

<table>
<thead>
<tr>
<th>starting SAP Instance D00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Startup Log is written to /home/vhslinicl/startup D00.log</td>
</tr>
</tbody>
</table>

| /usr/sap/NL/D00/exe/startcontrol -prot NL_HTTP -mr 00 -function Start |
| Instance on host vhslinicl started |
| Installation of NL successful |

E. INSTALL CLIENT(S)

ABAP Development Tools (ADT) ("ABAP in Eclipse")
To install ADT, go to SAP Development Tools: ABAP and follow the instructions there.

SAP GUI for Windows
If you have already a SAP GUI installation you can connect to your sytem (see “Connecting from SAP GUI for Windows, below). If not go ahead now with the client installation from <install_folder\client\SAPGUI4Windows:

- Short installation guide (SCN Wiki)
- Installation Guide (Long PDF)

SAP GUI for Java
Requirements for SAP GUI for Java include Oracle Java SE 8 32-bit or 64-bit, a properly installed Java Plugin and C++ runtime libstdc++.so.6.

F. POST-INSTALLATION SETTINGS

Network settings
We need to enter the right proxy settings at Virtual Box level, so that SAP GUI, ABAP in Eclipse etc can find your ABAP system:

1. In Oracle VirtualBox Manager, select the VirtualBox with the installed ABAP system on it, then choose Settings from the context menu.
2. From the left-hand menu, choose Network.
3. On the Adapter 1 tab, choose Attached to: NAT:
4. Open Advanced, then choose Port Forwarding.
5. In the dialog that appears, enter the following settings:

<table>
<thead>
<tr>
<th>Name</th>
<th>Protocol</th>
<th>Host IP</th>
<th>Host Port</th>
<th>Guest IP</th>
<th>Guest Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTTP</td>
<td>TCP</td>
<td>127.0.0.1</td>
<td>8000</td>
<td>10.0.2.15</td>
<td>8000</td>
</tr>
<tr>
<td>HTTPS</td>
<td>TCP</td>
<td>127.0.0.1</td>
<td>44300</td>
<td>10.0.2.15</td>
<td>44300</td>
</tr>
<tr>
<td>RFC</td>
<td>TCP</td>
<td>127.0.0.1</td>
<td>3300</td>
<td>10.0.2.15</td>
<td>3300</td>
</tr>
<tr>
<td>SAPGUI</td>
<td>TCP</td>
<td>127.0.0.1</td>
<td>3200</td>
<td>10.0.2.15</td>
<td>3200</td>
</tr>
</tbody>
</table>

Connecting to the ABAP server from SAP GUI for Windows
The VirtualBox VM is assigned the IP address 10.0.2.15 (because of the NAT network type). Your local WINDOWS cannot see that IP. Instead it will communicate to the VirtualBox VM through port-forwarding using 127.0.0.1 (your windows local host).
To connect to the ABAP server using SAP GUI for Windows:

1. Navigate to your Windows hosts file: C:\Windows\System32\drivers\etc\hosts.
2. Open this file in Administrator mode and add the following lines:
   #DL 752 SP02
   127.0.0.1 vhcalnplci vhcalnplci.dummy.nodomain
3. In the SAP Logon pad, choose New > Connection:
4. Choose User-specific system and enter the following:
   • Application server = 127.0.0.1
   • Instance = 00
   • System ID = NPL
ABAP License key

1. Start the SAP system:
   a) Switch to user `npladm` with your master password in the console: `su npladm`
   b) Start the SAP system: `startsap`

2. Log on to the system in SAP GUI, client `000` as user `SAP*` with default password `Download`.

3. Request the license key for your trial version at `SAP Sneak Preview License Key Request`.
   a) Select `NPL – SAP NetWeaver 7.x (Sybase ASE)` as System ID.
   b) Enter your personal data and agree to the License Agreement.
   c) Choose `Generate` (bottom right corner of screen.)
   d) The website automatically generates a `.txt` file for this system/key. Download and save this file, e.g., on the desktop for convenience.

4. Go to transaction `SLICENSE` and install the license file:
   a) In the tab `Digitally signed licenses`, delete the existing license, then choose `Install`. This opens the text file you got and installs the new license key.

Please note that all the above steps must be carried out; otherwise, the above user key will not work. The system type changes to Demo. You can now explore the demo scenarios and develop using the ABAP tools in Eclipse and new features like the core data services or SAPUI5 UIs.

Renewing your AS ABAP license

Many of you have asked about this: Yes, you can apply for a new license. Just use the same procedure as above.

In theory, indefinitely, however, the ASE and HANA licenses last for about a year.

IMPORTANT: To use the developer key that we provide, you MUST delete your old license before you install the new one (as described in step 4 above). Otherwise, the system will generate a different license that no longer matches our pre-configured developer key.

G. GETTING STARTED

Starting and stopping the server

With the user `npladm` you can start and stop the server using the terminal commands `startsap` and `stop.sap` respectively.

Guides and Tutorials

The [Guides and Tutorials](#) page includes:
- Reference scenarios
- Tutorials, e.g., for ABAP Basics, Core Data Services, SAP Gateway...
- Developer Guide to SAP HANA Studio
- (Older tutorials)

Working with Web Dynpro ABAP (WDA)

Some users have experienced problems. If so, follow the instructions in this thread:
Transporting ABAP development objects

NOTE: I have not really tested this – use at own risk.

The system has been set up in a way that allows you to import and export ABAP objects as transport of copies. For security reasons we removed the rfc connection and user tmsadm. See TMS Documentation to complete the configuration.

This section describes an export/import scenario.

Export

To export objects with a transport of copies you have to execute the following procedure:

1. In transaction SE01 choose Create (F6).
2. Mark Transport of Copies and choose Enter.
3. Enter a description.
4. As transport target enter DMY and choose Save.
5. Add the objects you need into the request. You may enter them either directly or via the menu Request/Task à Object List à Include Objects...
6. Go back (F3) and release the request.

You will find your transport files in the directories:

- /usr/sap/trans/data
- /usr/sap/trans/cofiles

For the file transfer you can use sFTP or SCP clients like WinSCP with user root and the private key file of your backend instance (see Connecting to Your Backend on OS Level) or you can directly import the existing PuTTY connection profile.

Import

To import transports into the system you have to execute the following procedure:

1. Copy your transport files to:
   - /usr/sap/trans/data
   - /usr/sap/trans/cofiles
2. For the file transfer you can use sFTP or SCP clients like WinSCP (see above).
3. Ensure that user npladm has sufficient rights for accessing your transport files (e.g. use the command `chown npladm:sapsys <file>`), otherwise the import will fail.
4. In transaction STMS open the Import Overview (F5) and double click on NPL.
5. In the menu select Extras -> Other Requests
6. Use the F4 help to select your transport request.
7. Choose Enter and answer the question if you want to attach the request to the NPL import queue with yes.
8. Mark the request in the import queue and select Ctrl+F11 (Import Request).
9. In the popup select for Execution “Synchronous” (for smaller request) and mark all import options.
10. Choose Enter and Yes to import your request.

Transporting ABAP development objects using ABAPGit

Note: I have not really tested this, but so far have had no issues. This is a Community solution, not an SAP solution, but may be of interest: abapGit
H. TROUBLESHOOTING RESOURCES

Troubleshooting downloading issues
If that fails, try contacting support team from link below
https://go.support.sap.com/contactus/#/email

Troubleshooting ABAP developer edition issues
Search first! Then ask your question in the ABAP Development Community forum:
https://www.sap.com/community/topic/abap/all-content.html

If it is an issue specifically involving ABAP developer edition, remember to add the hashtag #ABAP_Trial.

Please do not use comments in the blogs to ask tech support questions:
- Very few people follow these blogs, so you will not get help from the vast majority of the community
- There is no capacity to monitor all blogs for all released versions.
- It makes it difficult for other users to find similar issues in future, which leads to many duplicated errors.

Log files
If so, they should be in: /tmp/sapinst_instdir/NW73/SBC/STANDARD/

1. Navigate to this directory.
2. Open each file sap*.log in a text editor.
3. Copy the error messages (not INFO or WARNING) and paste them in here.

Then we can try to help.

Troubleshooting non-AS ABAP server issues:

For VirtualBox questions (ie if you don’t get as far as openSUSE):
Oracle Virtual Desktop Infrastructure, Getting Started
(For example, see chapter 6.3: Creating a New Virtual Machine)

Also, check out the: Oracle VirtualBox Forum

For openSUSE:
If you are newish to Linux, and want to do one thing to get up to speed, I would suggest familiarity with Terminal. I found William Schotts’ guide helpful – and surprisingly readable:
The Linux Command Line
Also, check out the SAP on Linux forum: SAP Community SAP on Linux Forum
There is also a general (non-SAP) forum for openSUSE: openSUSE Forum

For SAP GUI:
SAP Community forum (new)
I. APPENDIX: TECHNICAL INFORMATION

Directories and Users
The installation creates following directories and users:

Created Directories:

<table>
<thead>
<tr>
<th>Directory</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>/sapmnt</td>
<td>~ 2 GB</td>
</tr>
<tr>
<td>/sybase</td>
<td>~ 50 GB</td>
</tr>
<tr>
<td>/usr/sap</td>
<td>~ 3 GB</td>
</tr>
</tbody>
</table>

Created Users on OS level
The installation creates following users on OS level. During the installation you are prompted to enter the master password.

<table>
<thead>
<tr>
<th>User name</th>
<th>Password</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>sapadm</td>
<td>master password</td>
<td>Created by SAP hostagent</td>
</tr>
<tr>
<td>npladm</td>
<td>master password</td>
<td>SAP System Administrator</td>
</tr>
<tr>
<td>sybnpl</td>
<td>master password</td>
<td>SAP Database Administrator</td>
</tr>
</tbody>
</table>

The installed system provides the following database users:

<table>
<thead>
<tr>
<th>User name</th>
<th>Password</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAPSR3</td>
<td>Master password</td>
<td>SAP Schema User</td>
</tr>
<tr>
<td>sa</td>
<td>Master password</td>
<td>Superuser</td>
</tr>
<tr>
<td>sapsa</td>
<td>Master password</td>
<td>Superuser</td>
</tr>
<tr>
<td>sapsso</td>
<td>Master password</td>
<td>Superuser</td>
</tr>
</tbody>
</table>

The installed system provides the following SAP users in client 000:

<table>
<thead>
<tr>
<th>User name</th>
<th>Password</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDIC</td>
<td>Download</td>
<td>Data Dictionary User</td>
</tr>
<tr>
<td>SAP*</td>
<td>Download</td>
<td>SAP Administrator</td>
</tr>
</tbody>
</table>

The installed system provides the following SAP users in client 001:

Note: In general, you should develop using DEVELOPER or BWDEVELOPER (for BI content). SAP* is only for admin purposes, eg renewing the license.
<table>
<thead>
<tr>
<th>User name</th>
<th>Password</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDIC</td>
<td>Download</td>
<td>Data Dictionary User</td>
</tr>
<tr>
<td>SAP*</td>
<td>Download</td>
<td>SAP Administrator</td>
</tr>
<tr>
<td>DEVELOPER</td>
<td>Download</td>
<td>Developer User</td>
</tr>
<tr>
<td>BWDEVELOPER</td>
<td>Download</td>
<td>Developer User</td>
</tr>
</tbody>
</table>

**Uninstalling instructions**

If you ever want to uninstall your server, proceed as follows:

1. Delete the created directories
2. Delete the OS users
3. Delete the added lines in /etc/services (should be the last lines beginning with sap* and sql6* respectively)
4. Delete the line containing nplhost in /etc/hosts
5. Delete the symbolic link S99_nplhost.sh in the directory /etc/init.d/rc3.d in case of SUSE or /etc/rc3.d in case of Red Hat
6. Restart your network.