

SUSE YES System Certification Kit 9.0

SUSE Linux Enterprise – Server Test Suite



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About This Guide

The Server Yes Certification Test Kit for SUSE® Linux contains a procedure manual and all test tools necessary to test the SUSE® products used in the SUSE Yes Certified™ system certification process. The manual explains how to install the software and set up hardware and software configurations.

Audience

This manual is intended for users who have experience with computers, networking, Linux, and Microsoft Windows.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please contact your SUSE partner contact for feedback.

Documentation Updates

For the most recent version of the System Test Tools and documentation, visit System Test Tools for SUSE LINUX <https://www.suse.com/partners/ihv/yes/system-test-tools-for-suse-linux.html>.

Additional Information

For more Information on YES Certification, see:

SUSE YES Certified Program <https://www.suse.com/partners/ihv/yes/>

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1 SLES Configuration

Use this test suite to certify systems with SLES (latest support pack).

1.1 Configuring the Hardware

Minimum Requirements for System Under Test (SUT)

- ✓ Minimum SLES hardware requirements must be met on the SUT hardware. See the SLES online documentation for SLES hardware requirements.
- ✓ Direct access to the system under test (SUT). Do not use remote access, do not use SSH.
- ✓ Direct access to the TestConsole (TC). Do not use remote access, do not use SSH.
- ✓ Null modem serial cable (for systems with serial ports).
- ✓ 2 USB hard drives (Required for systems with USB ports) or USB flash drives (min 2 GB free space), no spaces in the volume name.
- ✓ 1 eSATA hard drive (Required for systems testing an eSATA port).
- ✓ SLES 15 (latest SP) or SLES 12 (latest SP).
- ✓ A monitor that supports the video adapter unless the system is headless.
- ✓ Enable only the video adapter which you want listed on the bulletin. Make sure that all video adapter ports on the primary video adapter are connected to monitors before the OS install begins. The monitors must remain connected until all testing is completed. All secondary video adapters must be disabled or removed from the system before installing the OS unless you are planning to test a GPU with compute capability. If you are testing a GPU with compute capability, then you must either download the GPU compute test or the TC must have internet access to be able to download the GPU Compute test. To properly set up a NIC in the TC for internet access so that the test kit will know not to test it, please follow the steps in the section titled "Dealing with Unused NIC ports on the TC" in the TestConsole Setup and Configuration document. Please see the troubleshooting document for the manual install instructions of the GPU Compute tests.
- ✓ 1 Ethernet connection minimum in the SUT and in the TC.

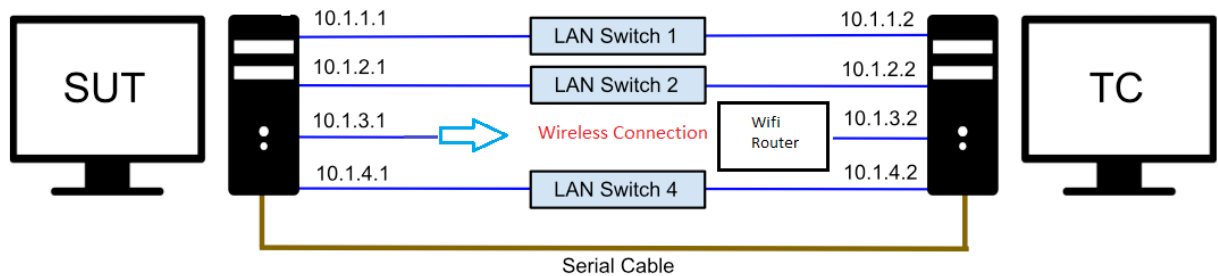


- ✓ All NIC adapters and all WiFi adapters in the system are required to be configured and to be tested. Remove any NIC adapters and any WiFi adapters which you do not intend to configure and to test before installing the OS.
- ✓ The TC NIC's must be as fast as or faster than the SUT NIC's. The switch between the TC and the SUT must be as fast as the fastest NIC's in the testing harness.
- ✓ Use Drivers which do NOT taint the kernel (Drivers in the distro will not taint the kernel). Compiling drivers for certification is not permitted. If drivers are needed please obtain them using the SUSE SolidDriver Program.
- ✓ We recommend UEFI be enabled during testing, if SUT the supports UEFI.
- ✓ Secure Boot is not required to be enabled during testing, it is optional. If Secure Boot is enabled during testing then a configuration note can be added stating this. When secure boot is enabled the OS installation must be completed manually, for example by DVD installation.
- ✓ All SUT hardware (RAM, Persistent Memory modules, NVDIMM, hard disk drives, NIC's, GPU compute cards, etc) must be installed in the SUT prior to installing the SLES OS.
- ✓ Persistent Memory modules should be installed and configured according to the Intel specification (ratio of DRAM to persistent memory) and your company supported configuration. The YES Certification testing process allows for various persistent memory configurations or modes (AppDirect, Memory or Mixed) to be validated and documented as a configuration note on the bulletin of a Certified hardware solution.
- ✓ Make sure the BIOS is set correctly to reflect the hardware configuration. Use only publicly released versions of the hardware for YES Certification testing, do not use engineering samples.
- ✓ All hardware in the SUT system is required to be tested. Only configure the system with the hardware which you intend to have tested. Any hardware which you do not want tested must be removed from the system before installing the OS.



Test Configuration for SLES Testing

Figure 1-1 Configuration for the tests with one NIC card with 4 Ethernet ports.



Note: When assigning IP addresses to the NICs, do not use the range 192.168.101.0 thru 192.168.101.255. These IP addresses are used in the Serial Port test.

1.2 Setting Up the SLES SUT

The following instructions are for installing SLES on the SUT. Before doing so, please ensure that the TestConsole system has been set up according to the TestConsole documentation. If your system has Persistent Memory modules which will be used as memory then please configure the Persistent Memory modules (or NVDIMM) now. To configure the Persistent Memory modules as system memory do so in your system UEFI configuration utility.

1.3 Install SLES 15 SP6 on SUT with PXE

1. Delete all existing partitions from all hard drives. Section "1.1 Removing the ELIO Boot Tables" in the Troubleshooting and Help Document has instructions which will delete any and all existing partitions.
2. Remove all external devices (USB, eSATA, Firewire, etc.) from the SUT.
3. Boot the SUT and enter the BIOS/UEFI configuration.

4. Ensure network boot (PXE) is enabled in the BIOS/UEFI. If needed, press the appropriate key to enter the BIOS/UEFI and select PXE boot during post. Exit out of the BIOS saving any changes which were needed.
5. PXE boot the SUT. The PXE server has to be the TC.
6. The SUSE SCK Install Main Menu will be displayed on SUT. Use the arrow keys (or the tab keys on some systems) to select the OS to install, then press <Enter>.
7. The SCK OS specific Install screen will be displayed. Use the arrow keys (or the tab keys on some systems) to select the OS install option which best meets your needs, then press <Enter>. There is a short delay after pressing enter then SUT will display the SLE GUI installation screen and the OS installation will begin. Each option is briefly explained below.
 - a. Single (hard) disk automated install – This option is appropriate for most servers which have a single hard disk drive or a RAID configuration which appears as a single hard drive. All OS installation settings are completed for the user and are automatically installed onto the SUT.
 - b. Multiple (hard) disk automated install – This is the same as single-disk install except the user will be provided with the ability to configure disk partitions and specify the OS installation location.
 - c. Manual install – The manual OS installation is like a DVD install. The user inputs all settings for each configuration screen during the OS install.
8. If an automated install (single/multiple disk or No GUI Headless) was selected then wait for the installation to complete. Once the OS installation has completed then proceed to Section 2.0, "Creating a New Test Project".
9. If a manual install was selected then proceed to the documentation Section 4, "Manually Installing SLES" then use the installation instructions for the OS which you chose to install.



2 SLES Pre-Testing and Preparation

2.1 Creating a New Test Project

1. If you will be testing with Wifi then your Wifi router/Wifi Network will need to be setup before proceeding to the next steps. If it is not set up then do so now.
2. Log into the SUT by typing root in the username. On the password screen click on the setting cog in the lower right then click on Gnome classic. The password should be suse.
3. On the SUT, open a terminal window.
4. On SUT, in the terminal window Type `yast2 lan` <Enter>.
5. On SUT, Click on the *Hostname/DNS* tab.
6. On SUT, Type SUT into the Hostname Field.
7. Configure the LAN adapter.
 - 7a. Click on the Overview Tab.
 - 7b. Click on the LAN adapter `eth0`, then click Edit.
 - 7c. Click on the Statically Assigned IP Address radio button.
 - 7d. Type in the LAN Adapter IP address. The default IP address which we use in the test kit for testing `eth0` is 10.1.1.1.
 - 7e. Type in the Subnet mask (255.255.255.0).
 - 7f. Click Next.
 - 7g. If prompted click YES to leave the host name blank.
 - 7h. Repeat the steps above for each cabled LAN adapter.
8. If you are testing a wireless adapter in the SUT, then configure the Wi-Fi adapter on the SUT using the following steps:
 - 8a. Your system may need SUSE Workstation extensions for the Wi-Fi adapter to work.
 - 8b. Click on the Overview Tab.
 - 8c. Click on the wireless adapter, then click Edit.
 - 8d. The Wireless Network Card Setup screen will appear.
 - 8e. Click on the Choose Network button next to the Network Name (ESSID) field.



8f. If a Yast2 pop up window is displayed stating that the wireless-tools package will be installed, click the install button. If the wireless-tools package has an error during the install then close yast2 lan and do the following:

Type yast2 <Enter>.

Click on Software Repositories.

Click on each Repositories listed then click on the enable check box under properties in the bottom left.

Click OK.

Close the yast2 control center by clicking on the x at the top right.

Perform the steps above in 7 again to configure the Wifi adapter.

8f. The Available Networks window will pop up. Click on your wireless network then click OK.

8g. Click on the Authentication Mode drop down then choose the encryption method which your wireless router uses.

8h. In the Encryption Key field type in the password for your wireless router. If your wireless router does not have a password, then leave this field blank.

8i. Click on the Address tab.

8j. Click on the Statically Assigned IP Address radio button

8k. Type in your Wi-Fi IP address. The default SUT Wi-Fi IP address which we use in the test kit for testing is 10.1.3.1.

8l. Type in the Subnet mask (255.255.255.0).

8m. Click Next.

9. On the SUT click on the OK button in the YaST2-Network Settings window.

10. On the SUT close the Terminal.

11. Reboot the SUT then login as root.

12. The next steps will be performed on the TC.

13. Ensure that you have updated the products.txt file as Instructed in the TestConsole documentation.

14. Click the *New* button on the menu bar. Direct Access to the TC, and SUT systems are required, do not use remote access, do not use SSH).

15. Click on the appropriate project (listed below) then click the select button.

- Server - Full
- Server - Reduced (See the Reduced Testing Policies located at https://www.suse.com/partners/ihv/pdf/System_Certification_Policies.pdf)



Website to determine eligibility to use this test project).

16. A default unique project file-name will be generated. The unique project file-name contains a date-stamp and time-stamp. You may choose a different unique project file-name limited to 58 characters by typing a file name into the project file name field. Do not use more than 58 characters in the file name. Click on Save to save the project. If you change the project name please use a unique project file-name which has not been used previously.

Notes: Do not put spaces or html control characters in the file name.

17. Follow any onscreen prompts.
18. Continue to the IP address Information

2.2 IP Address Information

1. The SUT IP Address should have been configured before this point. If your SUT has a WiFi adapter then the IP address should have been configured by this time.
2. Review the IP addresses listed in the Project Contents window for SUT, and TC. Each IP address will be auto detected.
3. The IP Address for the SUT will not be auto detectable until after the test kit is installed onto the SUT. The default IP address of 10.1.1.1 will be listed. If the IP address for SUT is incorrect, do the following:
 - a. Double-click the SUT IP address.
 - b. Enter the correct IP address in the Selection field.
 - c. Click OK.
4. If the IP address for TC is incorrect, do the following:
 - a. Double-click the TC IP address to be changed.
 - b. Enter the correct IP address in the Selection field.
 - c. Click OK.
 - d. Repeat steps 3a, 3b, and 3c, for each TC IP address which needs to be changed.



2.3 Install Tests

The tests listed under the Install Test are part of the steps required to prepare for the SUSE YES Certification testing.

1. The install tests should all be displayed under the Install Test category. If they are not displayed, then click on the + in front of the Install Test.

2.3.1 Install Kit on the SUT

Test Objective: This test will install the SUT portion of the YES Certification Test Kit onto the SUT.

1. Double-click Install Kit on SUT under the TestConsole project for the SUT.
2. On TC, if prompted select the SUT IP address from the displayed list. To determine the SUT IP address, on the SUT open terminal window the type ip a <Enter>. The SUT IP address will be displayed.
3. On TC, when prompted type the SUT password (i.e. suse) then press <Enter>.
4. If prompted with a question "nfs://.... Remove the repo from the repository(Y/n)?" answer the question. This question may appear more than once.
5. Follow all onscreen Instructions. This may include Installing a missing rpm.
6. If prompted on TC or SUT that yast will open to allow you to configure your hard disk, then you should do so. Use the Tab key to move around in the yast window. Check the existing configuration and make any needed changes. When you are done, then Tab over to the Finish button at the bottom then press Enter.
7. When prompted to "Enter a NIC number to modify...", make sure that all NIC's have an IP Address assigned. The default SUT Wireless NIC IP Address used by the test kit is 10.1.3.1. If the Wi-Fi IP address is not listed, then repeat the steps in the Creating a new test project section.
8. For a SLES 12 SP5 SUT, login as root. The password should be suse. For a SLES 15 SP6 SUT do the following:
 - a. If the GUI login screen is not displayed on the SUT then on the SUT press <Ctrl><Alt><F7> at the same time to bring up the GUI. This step does not apply headless systems. Type root in the Username field, then click next. On the password screen click on the gear/cog located next to the sign in button. Click on GNOME Classic. Type in the root password, then press <Enter>. The password should be suse.
9. On the TC press <Enter> as prompted once the Test Kit installation has completed.



10. If this test fails, reboot the TC, then try this test again.

2.3.2 Install Check Test

Test Objective: Verify that SLES and the test kit installed correctly.

1. Double-click Install Check under the TestConsole project for the SUT.

2.3.3 Enable Component Check Test

Test Objective: This test prepares for the component check.

1. Double-click Enable Component Check under the TestConsole project for the SUT.

2.3.4 Configure the Persistent Memory Modules

If your system has Persistent Memory modules, then please complete the configuration which your system supports. Persistent Memory modules configured in Memory mode only should have already been completed before the SLES installation. If testing the persistent memory in AppDirect mode only, follow the steps in this section. If testing the persistent memory in Mixed mode, complete the Memory to AppDirect percentage configuration before the SLES installation. If your system supports Memory mode or AppDirect mode, you can test and certify each separately during single certification test. To test Memory mode and AppDirect mode separately, you will configure the AppDirect mode first, then reconfigure to Memory mode before beginning the Stress Tests.

Note: system RAM and Persistent Memory amounts are listed separately on a YES Certification bulletin. If you are testing a system only in Memory mode, or in Mixed mode, you will need to change the auto-detected RAM amount listed on TestConsole after running the Component Check test. Persistent Memory amounts are entered manually after uploading a submission to SBS (SUSE Bulletin System).



To prepare the Persistent Memory modules as a storage device (AppDirect Mode) the instructions below can be used.

1. We used the following command line instructions to set up the persistent memory in our lab on SLES 15 SP4.
 - a. `ndctl create-namespace -t pmem -m fsdax -s 1g -r 0`
Note: Only one region/partition is required for certification. The “-s 1g” sets the partition sized to 1 gigabyte; some system configurations may need more space allocated. The -s value can be set from 1g to 128g. The larger memory space size allocated (example 128g) the longer the test will run. The “-r 0” designates region 0, any region can be selected. Only one region needs to be created and tested.
 - b. Make sure that `/dev/pmem*` exists.
 - c. `mkfs.xfs -f /dev/pmem0` Note: This assumes pmem0 as the device selected (only one device is required for certification).
 - d. `mkdir /mnt/pmem0`
 - e. `mount -o dax /dev/pmem0 /mnt/pmem0/`
2. All persistent memory must be configured as a ratio of memory (RAM) to Persistent Memory. See Intel’s website for supported persistent memory configuration ratios.
3. We added the following Information to the end our `/etc/fstab` file which ensured that the persistent memory was still configured after a system reboot. The information below is an example which worked for our configuration and should be adjusted accordingly to function for your configuration.
 - a. `/dev/pmem0 /mnt/pmem0 xfs dax,nofail 0 0`
4. To view the persistent memory configuration run the instructions below on the SUT:
 - a. `ndctl list --regions`
 - b. `ndctl list --dimms`

2.4 Component Check Test

This test will gather system information about the SUT. Ensure that all devices (e.g. wireless LAN adapter) are enabled before starting the Component Check Test. Any changes made to SUT (hardware, drivers, BIOS/firmware updates) after this test is run will not be detected in the system information screens. It is important that all hardware, drivers, BIOS/firmware updates



which will be used during testing are installed on the SUT before starting the Component Check Test. All subsequent tests will be available once the validate install test and component check test are completed. If a detected component is deleted from the detected devices, it can be listed again by starting the component check test again. Direct access to the TC, and SUT systems are required (do not access remotely, do not use SSH).

1. Double-click *Component Check* in the Project Contents pane.
2. Follow any on-screen prompts on TC.
3. Click Yes on the Open Edit Product/Report pop-up window.
4. Click on the Edit Product/Report button in the button pane near the top of the screen.

2.5 Product and Report Information Entry

The Product and Report Information screen is the product information input tool for your YES Certification Bulletin. The hardware information entered on the following screens will be the same information which appears on your YES Certification bulletin. Please be accurate with all inputted information.

Notes: Direct access to the TC, and SUT systems are required (do not access remotely, do not use SSH).

1. Click the *Edit Product/Report* button to open the Product & Report Information window.
2. Proceed to the next section (System Information Entry).

2.5.1 System Information Entry

The system information consists of all fields under the System tab. Much of the OS detected information will be filled in automatically, but it needs to be checked for accuracy. The fields are editable and can be corrected as needed. This is the information which will appear on the YES Certification Bulletin. It is important to complete all information entry in this section accurately before testing the SUT.



Figure 2-1 System Tab.

Warning: Direct access to the TC, and SUT systems are required (do not access remotely, do not use SSH). Ensure that all fields are filled out in the System tab before starting tests. Test Results will be cleared if these fields are changed (with the exception of the Product Description field and Configuration Note field). The system information fields are required to be completed for the test results submission file to successfully read into the SUSE Bulletin System (SBS).

1. Enter the System Information. The detectable information will be filled in automatically but needs to be checked for accuracy.
 - a. If missing or incorrect, enter the System Name and Model.
 - b. If missing or incorrect, choose the Computer Type from the drop-down list.



- c. If missing or incorrect, enter the Mother Board Revision.
 - d. If missing or incorrect, enter the system BIOS/UEFI version information. There are three possible options to be reported in the BIOS / UEFI field: UEFI, BIOS or UEFI-Legacy. Edit this field to be the correct information. The line must display one of the following:
 - i. UEFI: <version> <date> – This means that the firmware on the hardware platform is UEFI and the system was booted in its UEFI enabled configuration. It also means that the SLES OS on the SUT was installed and booted using the UEFI boot loader (ELILO). Example: UEFI: AJ152 (12/24/2013).
 - or
 - ii. BIOS: <version> <date> – This means that the firmware on the hardware platform is a traditional BIOS and the system was booted through the BIOS. It also means that the SLES OS on the SUT was installed and booted using the traditional or legacy boot loader (GRUB). Example: BIOS: AJ152 (12/24/2013).
 - or
 - iii. UEFI-Legacy: <version> <date> – This means that the firmware on the hardware platform is UEFI and was booted UEFI. It also means that the SLES OS on the SUT was installed and booted using the traditional or legacy boot loader (GRUB). Example: UEFI-Legacy: AJ152 (12/24/2013).
 - e. If missing or incorrect, enter the system Memory (RAM) then choose from the drop-down the units of measure (e.g., Megabytes, Gigabytes, etc.). The RAM amount must not include the Persistence memory amount.
2. Select the CPU in the SUT.
- a. Click the '+' button next to the CPU's field.
 - b. Select the appropriate CPU from the filter list. The short list of the closest detectable matching CPU/s will be listed on the screen. If this is the correct CPU and the quantity which is in your SUT then click on the CPU to select it. Then click OK.
 - c. If needed use a search filter to find the CPU in the SUT. If the correct CPU was not detected, there are 3 additional filter methods to use when searching for the CPU. The CPU should be selected from the results when using any of these filters. The filter types are: previously selected, short list, long list, and search all CPU's. These can be selected by clicking on the associated radio button on the screen. Below is an explanation of each filter.

Previously Selected – This filter will display all CPU's previously used.

Short List – This is the default filter when the screen is opened. The CPU/s containing all of the auto detected criteria will be displayed.



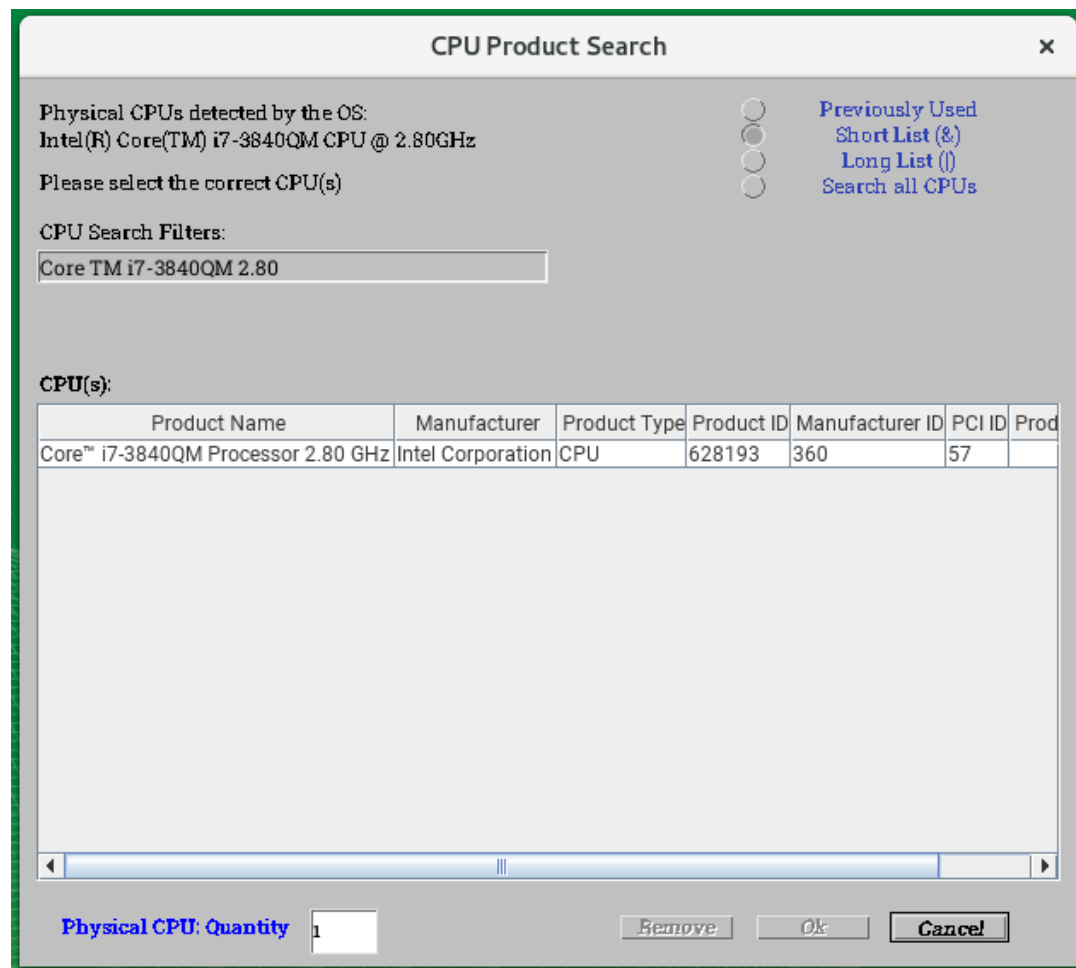
Long List – The CPU/s containing any part of the auto detected criteria will be displayed.

Search all CPU's – This is an editable interactive search filter. The editable search field will appear. Enter any information to search on. If no search criteria is entered, then all CPU's will be listed. If the correct CPU still does not appear in the filter list after using each of the search filters, then choose a substitute CPU for testing. Propose the new unlisted CPU in SBS. See the SBS users guide for more information.

- d. The CPU quantity will also be automatically filled in. If CPU quantity is missing or incorrect, then enter the correct quantity.
- e. To remove a CPU, select a different CPU.
- f. Click OK.

Figure 2-2 CPU Selection Window





- Enter the Product Description. The product description field on a YES CERTIFIED bulletin is a way to include additional information about your product that is important, but that is not listed elsewhere on the bulletin.

Requirements for the Product Description:

- Product description must be in English and may not exceed 1,000 characters.
- Do not use carrots < > in the product description.
- Do not use special characters such as trademarks or copyrights in the product description.
- Do not make claims that are difficult or impossible to substantiate, especially over time.

Some examples include the following:

- Do not use phrases like "this is the best...", "fastest...", etc.).



- Do not make statements about product lines or product series. It must be specific to the product tested and the configuration listed in the specific bulletin.
- Do not compare your product to a competitor's product or other products on the market.
- If a component category is not listed on the bulletin in the tested configuration area, but was part of the tested configuration, it may be included in the product description.
- Do not indicate optional adapter/driver configurations. A separate bulletin is required for the adapter / driver pair.
- Do not list alternate processor family, unless test results are submitted for these alternate processors.
- If alternate configurations of components are available and desired on a bulletin (video, hard drives, keyboards, etc.), then a separate bulletin must be created. If it is desired to list a "variety of options" (hard drives, optical drives, etc. are available), then each must have a separate bulletin.

Note: SUSE reserves the right to remove any information from the bulletin submission that is deemed questionable with regards to this process at its own discretion.

- Any Required installation or configuration instructions should not be in the product description but should instead be included in the configuration notes section of the bulletin.

To provide additional product marketing information, the following options are provided:

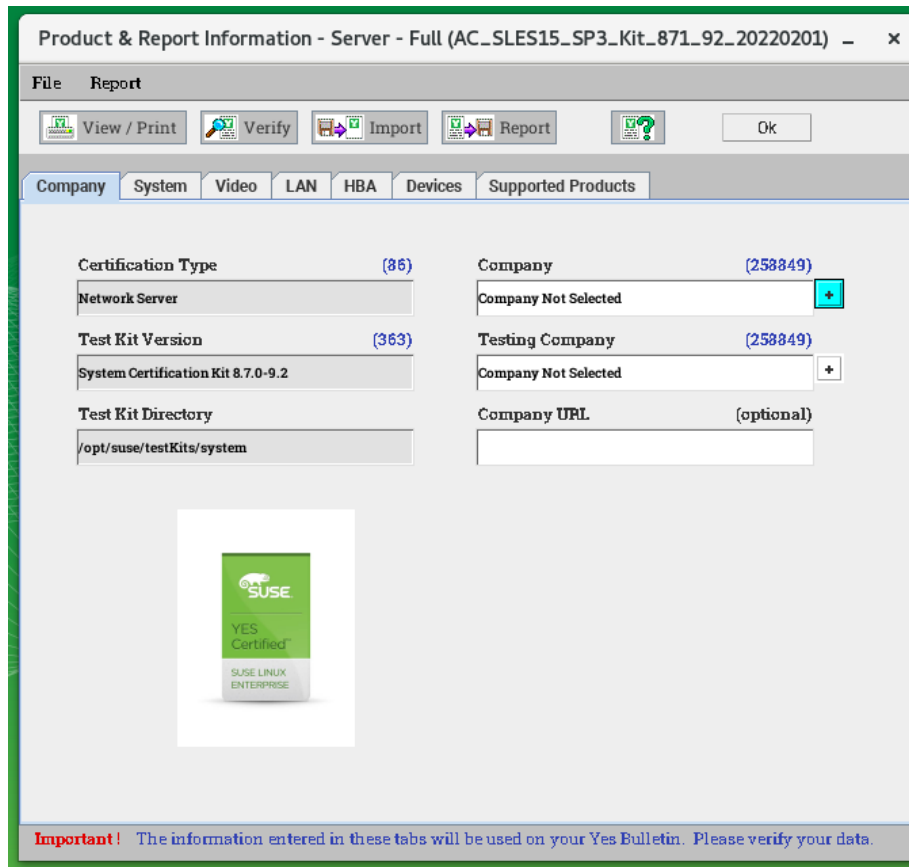
- A URL where additional product information can be obtained can be included in the product description. Note that the bulletin becomes a static document, so use a link that is not likely to change (you may want to use your company Web site).
4. Enter configuration notes into the Configuration Note field. Configuration Notes may also be added to the Yes Certification Bulletin after the bulletin submission is read into the SBS database.
- If any boot parameters were used for the OS Installation on the SUT, please enter this information into the Configuration Note field.
 - If the certification testing is for XEN, provide the Base SLES bulletin number in the configuration note or enter the information into the communications section of the bulletin submission in SBS.
 - Add any configuration information an end-user would need when using the system.

2.5.2 Company Information Entry

The company information consists of all fields under the Company tab.

1. Select the Company tab.



Figure 2-3 Company Selection Window


Product & Report Information - Server - Full (AC_SLES15_SP3_Kit_871_92_20220201) — x

File Report

View / Print Verify Import Report ? Ok

Company System Video LAN HBA Devices Supported Products

Certification Type (36)
Network Server

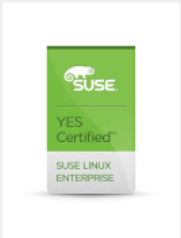
Test Kit Version (363)
System Certification Kit 8.7.0-9.2

Test Kit Directory
/opt/suse/testKits/system

Company (258849)
Company Not Selected +

Testing Company (258849)
Company Not Selected +

Company URL (optional)



Important! The information entered in these tabs will be used on your Yes Bulletin. Please verify your data.

2. Enter the system manufacturer company name.
 - a. Click the '+' next to the Company field.
 - b. Select your company name by clicking on it. The first time that a company name is selected it will automatically be entered into the testing company name field.

Note: If your company name is not listed in the company drop down list, leave the default name "Company Not Selected". Your company will be automatically added to the products.txt once your company has a bulletin submission in SBS with your company name listed. See the SBS users guide document for more information about adding a company to SBS.

- c. Click *Select*.



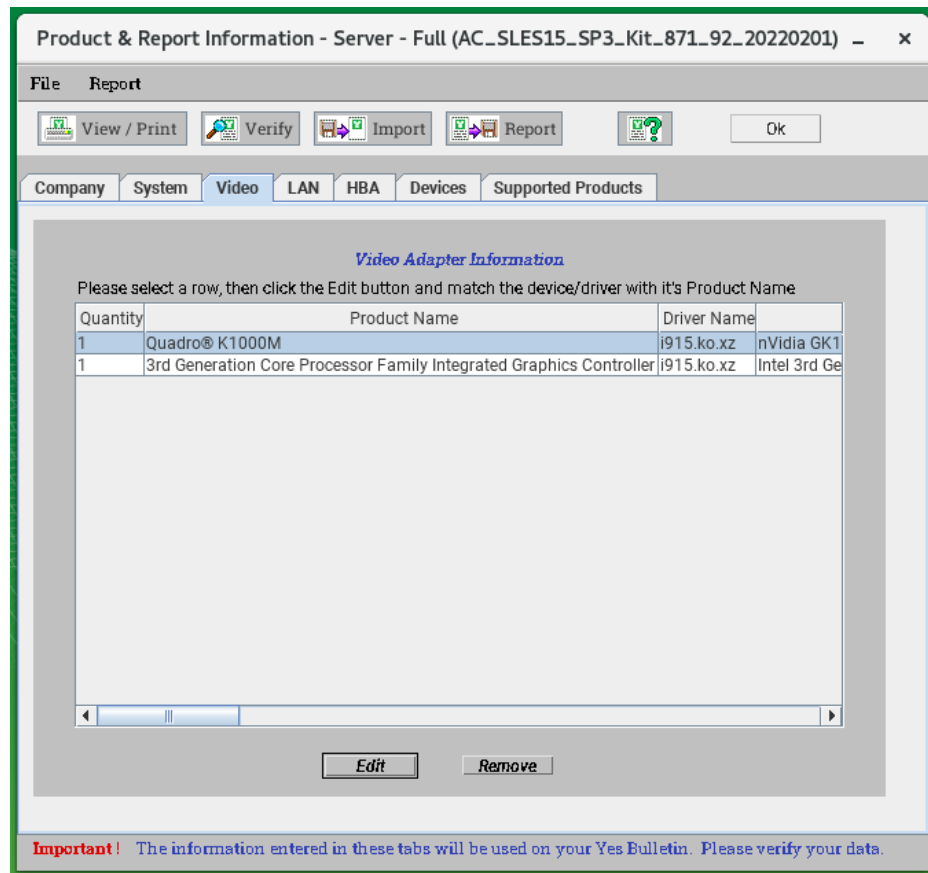
3. Change the Testing Company name if it is different from the system manufacturer company name.
 - a. Click the '+' next to the Testing Company field.
 - b. Select the testing company name by clicking on it.
 - c. Click *Select*.
4. Type in the Company URL (optional).
 - a. Enter the quantity of ports or slots on the SUT.
 - b. Click OK.



2.5.3 Video Device Information Entry

1. Select the Video Adapter used in the SUT.
 - a. Click on the *Video* tab.
 - b. Click on the first video adapter listed.

Figure 2-4 Video Tab



Product & Report Information - Server - Full (AC_SLES15_SP3_Kit_871_92_20220201) - x

File Report

View / Print Verify Import Report Ok

Company System **Video** LAN HBA Devices Supported Products

Video Adapter Information

Please select a row, then click the Edit button and match the device/driver with it's Product Name

Quantity	Product Name	Driver Name	
1	Quadro® K1000M	i915.ko.xz	nVidia GK1
1	3rd Generation Core Processor Family Integrated Graphics Controller	i915.ko.xz	Intel 3rd Ge

Edit Remove

Important! The information entered in these tabs will be used on your Yes Bulletin. Please verify your data.

- c. Click *edit* in the Video Tab window.
- d. Select the appropriate video adapter from the filter list. Any previously selected video adapter will be listed on the screen. If this is the correct video adapter and quantity which is in your SUT then click on the displayed video adapter to select it, then click OK. If there are no additional video adapters to select, then go to the LAN Device Information entry section. Repeat the steps in 1 for each additional video adapter in the SUT. If the video adapter which is in the SUT is not being listed, then go to step 1e.

Figure 2-5 Video Edit/Selection Window

Select New Video Adapter Product Name

Device Model (Detected by OS): 3rd Gen Core processor Graphics Controller
Driver Name (Detected by OS): i915.ko.xz
Manufacturer (Detected by OS): Lenovo

Select a device to be listed with the adapter:

Device Search Filters:
 3rd Gen Core processor Graphics Controller

Device list:

Product Name	Manufacturer	Product Type	Product ID
3rd Generation Core Processor Family Integrated Graphics Controller	Intel Corporation	Video Adapter	56776

Quantity: 1

Buttons: Ok, Cancel

- e. Use a search filter to list the video adapters to choose from. If the correct video adapter was not detected, there are additional search filters to use when searching for the correct video adapter. The video adapter should be selected from the results when using any of these filters. The filter types are: previously selected, short list, long list, and search all devices. These can be selected by clicking on the associated radio button on the screen. Below is an explanation of each filter:

- **Previously Selected** – This is the default filter when the screen is opened. This filter will display all video adapters previously selected.
- **Short List** – The video adapter containing all of the auto detected criteria will be displayed.
- **Long List** – The video adapter/s containing any part of the auto detected criteria will be displayed.
- **Search all Devices** – This is an interactive search filter. The editable search field will appear.
- Enter any information to search on. If no search criteria is entered, then all video adapter's will be listed. You may want to search for part or all of the device or name. For example, to search for an NE 2000, search for NE or 2000. Or search for the *Company* or *ID number*.

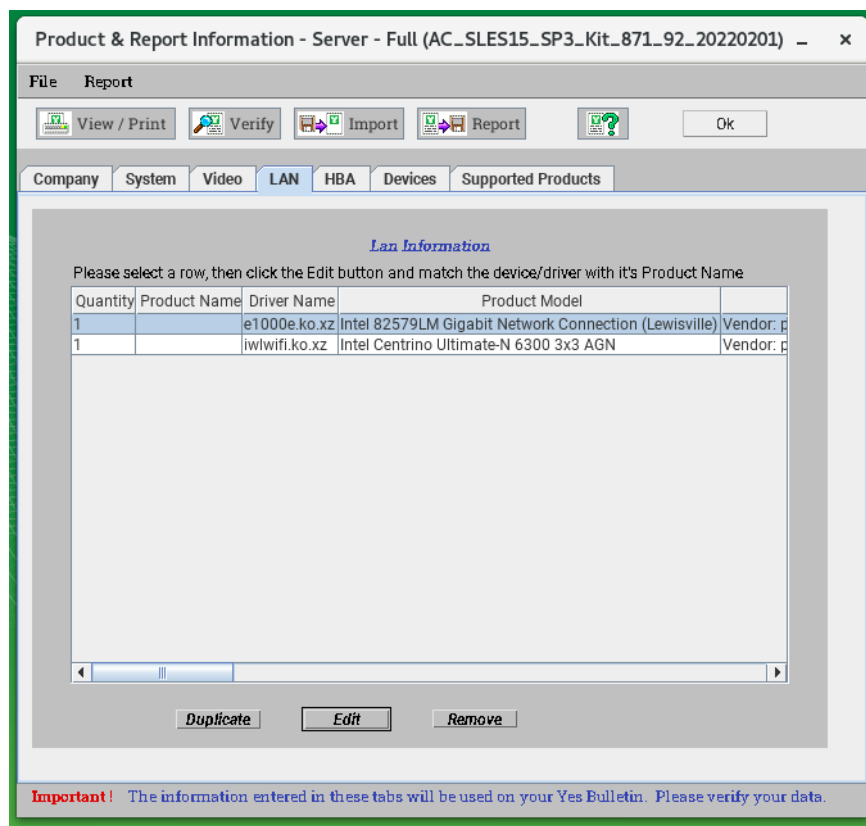
- **Propose New Device (not found in database)** – This is the method used to propose new video adapters. If the video adapter cannot be found, then it must be proposed as new adapter.
- f. If the video adapter cannot be found with the filters, then it must be proposed as a new adapter which is not already contained in the SBS database.
 - i. Click on the *Propose new device* radio button.
 - ii. Enter the video adapter product name.
 - iii. If the device type listed is not correct, then select the correct device type from the drop-down choices.
 - iv. Click on the *Manufacturer* drop down to select the video adapter manufacturer.
 - v. Click *OK*.
 - vi. After the bulletin submission file is read into SBS, a manufacturer URL will need to be added for the proposed device. See the SBS Users Guide for more information about adding a URL.
 - g. The video adapter quantity will also be automatically filled in. If the video adapter quantity is missing or incorrect, then enter the correct quantity.
 - h. Click *OK*. Repeat the video selecting steps until all video devices in the SUT are selected.
 - i. To remove a video adapter, click the *Edit Product/Report* button. Click on the video tab. Click on the video adapter to remove, then click remove. Follow the onscreen prompts.
2. To restore a deleted video adapter,
 - a. Close the **Product & Report Information** screen by clicking on the **OK** button.
 - b. Double-click *Component Check* in the *Project Contents pane*.
 - c. Click on the *Edit Product/Report* button.
 - d. Click on the video tab. The removed video driver will be listed.
 - e. Repeat the video selecting steps until all video adapters are selected.



2.5.4 LAN Device Information Entry

1. Select the LAN Adapter/s used in the SUT.
 - a. Click on the *LAN* tab.
 - b. Click on the first LAN adapter listed.

Figure 2-6 LAN Tab



Product & Report Information - Server - Full (AC_SLES15_SP3_Kit_871_92_20220201) - x

File Report

View / Print Verify Import Report ? Ok

Company System Video **LAN** HBA Devices Supported Products

Lan Information

Please select a row, then click the Edit button and match the device/driver with it's Product Name

Quantity	Product Name	Driver Name	Product Model	Vendor
1	e1000e.ko.xz	Intel 82579LM Gigabit Network Connection (Lewisville)		Vendor: p
1	iwlwifi.ko.xz	Intel Centrino Ultimate-N 6300 3x3 AGN		Vendor: p

Duplicate Edit Remove

Important! The information entered in these tabs will be used on your Yes Bulletin. Please verify your data.

- c. Click *edit* in the *LAN Tab* window.

Figure 2-7 LAN Edit Window

- d. Select the appropriate LAN adapter from the filter list. Any previously selected LAN adapter will be listed on the screen. If the correct LAN adapter and quantity which is in your SUT is displayed, then select the displayed LAN and then click OK. If there are no additional LAN devices in the SUT then go to the HBA Device Information entry section. Repeat the steps in 1 for each additional LAN adapter in the SUT. If the LAN adapter which is in the SUT is not being listed, then go to step e.
- e. Use a search filter to list the LAN adapters to choose from. If the correct LAN adapter was not detected, there are additional search filters to use when searching for the correct LAN adapter. The LAN adapter should be selected from the results when using any of these filters. The filter types are: previously selected, short list, long list, and search all devices. These can be selected by clicking on the associated radio button on the screen. Below is an explanation of each filter.
 - **Previously Selected** – This is the default filter when the screen is opened. This filter will display all LAN adapters previously selected.
 - **Short List** – The LAN adapter containing all of the auto detected criteria will be displayed.
 - **Long List** – The LAN adapter/s containing any part of the auto detected criteria will be displayed.
 - **Search all Devices** – This is a editable interactive search filter. The editable search field will appear. Enter any information to search on. If no search criteria is entered,

then all LAN adapter's will be listed. You may want to search for part or all of the device or name. For example, to search for an NE 2000, search for NE or 2000. Or search for the *Company* or *ID number*.

- **Propose New Device (not found in database)** – This is the method used to propose new LAN adapters. If the adapter cannot be found, then it must be proposed as a new adapter.
- f. If the LAN adapter cannot be found with the filters, then it must be proposed as a new adapter which is not already contained in the SBS database.
 - i. Click on the *Propose new device* radio button.
 - ii. Enter the LAN product name.
 - iii. If the device type listed is not correct, then select the correct device type from the drop-down choices.
 - iv. Click on the *Manufacturer* drop down to select the LAN adapter manufacturer.
 - v. Click *OK*.
 - vi. After the bulletin submission file is read into SBS, a manufacturer URL will need to be added for the proposed device. See the SBS Users Guide for more information.
 - g. The LAN adapter quantity will also be automatically filled in. If the LAN adapter quantity is missing or incorrect, then enter the correct quantity.
 - h. Click *OK*. Repeat the LAN selecting steps until all LAN's in the SUT are selected.
2. To remove a LAN driver or LAN adapter, Click the *Edit Product/Report* button.
 - a. Click on the LAN tab.
 - b. Click on the LAN driver or LAN adapter to remove.
 - c. Click remove. Follow the onscreen prompts.
 3. To restore a deleted LAN driver,
 - a. Close the *Product & Report Information* screen by clicking on the *OK*.
 - b. Double-click *Component Check* in the *Project Contents* pane.
 - c. Click on the *Edit Product/Report* button.
 - d. Click on the *LAN* tab. The removed LAN Driver will be listed.
 - e. Repeat the LAN selecting steps until all LAN's in the SUT are listed.



2.5.5 HBA Device Information Entry

1. Select the HBA used in the SUT.
 - a. Click the *HBA* tab.

Figure 2-8 HBA Tab

The screenshot shows a software window titled "Product & Report Information - Server - Full (AC_SLES15_SP3_Kit_871_92_20220201)". The window has a menu bar with "File" and "Report". Below the menu bar is a toolbar with icons for "View / Print", "Verify", "Import", "Report", and a help icon, along with an "Ok" button. A tabbed interface is present with tabs for "Company", "System", "Video", "LAN", "HBA", "Devices", and "Supported Products". The "HBA" tab is selected, displaying "HBA Information".

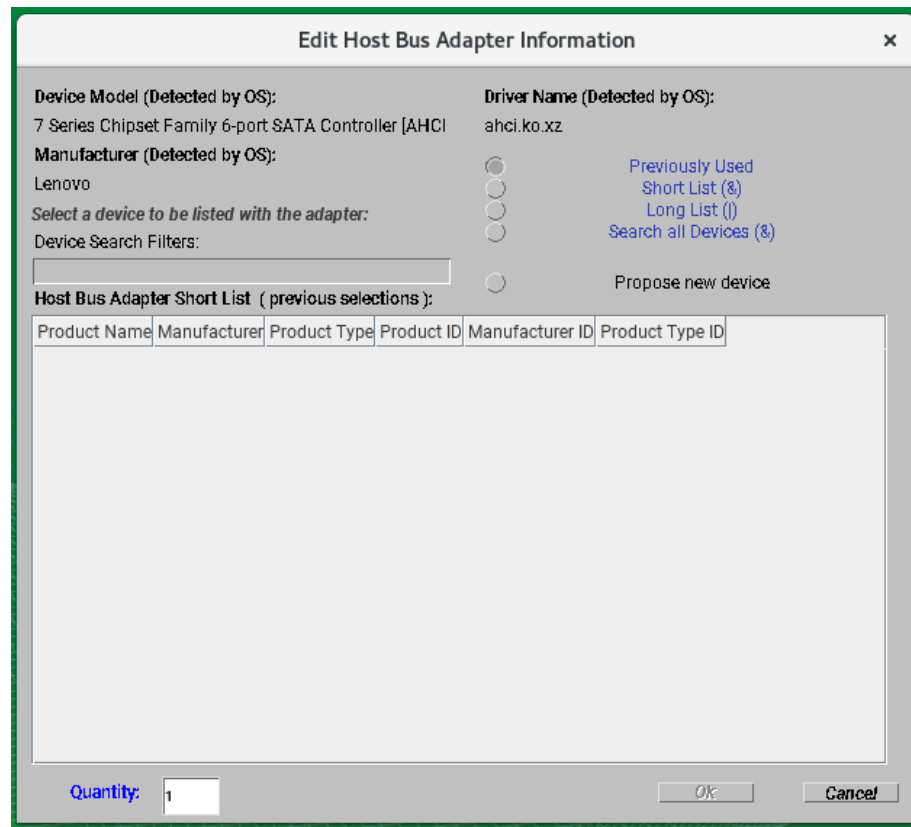
Below the tab, there is a text prompt: "Please select a row, then click the Edit button and match the device/driver with it's Product Name". Below this is a table with the following data:

Quantity	Product Name	Driver Name	Product Model
1		ahci.ko.xz	Intel 7 Series Chipset Family 6-port SATA Controller [AHCI mode]

Below the table is a large empty rectangular area. At the bottom of the window, there are "Edit" and "Remove" buttons. A red banner at the very bottom contains the text: "Important! The information entered in these tabs will be used on your Yes Bulletin. Please verify your data."

- b. Click on the first HBA listed.
 - c. Click *edit* in the *HBA Tab* window.

Figure 2-9 HBA Edit/Selection Window



- d. Select the appropriate HBA from the filter list. Any previously selected HBA will be listed on the screen. If this is the correct HBA adapter and quantity which is in your SUT then click on the displayed HBA to select it, then click OK. If there are no additional HBA's in the SUT then go to the Storage Device Information entry section. Repeat the steps in 1 for each additional HBA in the SUT. If the HBA which is in the SUT is not being listed, then go to step 1e.
- e. Use a search filter to list the HBA to choose from. If the correct HBA was not detected, there are additional search filters to use when searching for the correct HBA. The HBA should be selected from the results when using any of these filters. The filter types are: previously selected, short list, long list, and search all devices. These can be selected by clicking on the associated radio button on the screen. Below is an explanation of each filter.
 - **Previously Selected** – This is the default filter when the screen is opened. This filter will display all HBAs previously selected.
 - **Short List** – The HBA containing all of the auto detected criteria will be displayed.
 - **Long List** – The HBA containing any part of the auto detected criteria will be displayed.

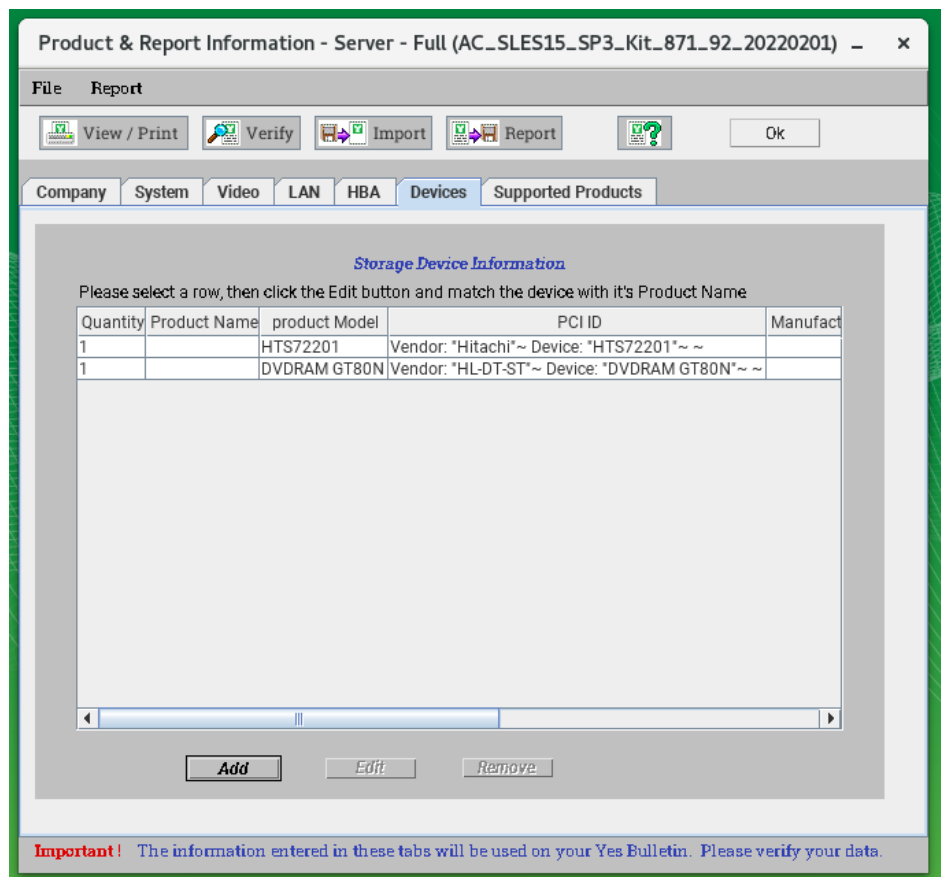
- **Search all devices** – This is an interactive search filter. The editable search field will appear. Enter any information to search on. If no search criteria is entered, then all HBA's will be listed. You can search for part or all of the device or name. Or search for the *Company* or *ID number*.
 - **Propose New Device (not found in database)** – This is the method used to propose new HBA. If the HBA cannot be found, then it must be proposed as a new adapter.
- f. If the HBA cannot be found with the filters, then it must be proposed as a new adapter which is not already contained in the SBS database.
 - i. Click on the *Propose new device* radio button.
 - ii. Enter the HBA product name.
 - iii. If the device type listed is not correct, then select the correct device type from the drop down choices.
 - iv. Click on the *Manufacturer* drop down to select the HBA manufacturer.
 - v. Click *OK*.
 - vi. After the bulletin submission file is read into SBS, a manufacturer URL will need to be added for the proposed device. See the SBS Users Guide for more information.
 - g. The HBA quantity will also be automatically filled in. If the HBA quantity is missing or incorrect, enter the correct quantity then click *OK*.
 - h. Repeat the HBA selecting steps until all HBA's in the SUT are selected.
 - i. To remove an HBA, Click the *Edit Product/Report* button. Click on the HBA tab. Click on the HBA driver or HBA to remove, then click remove. Follow the onscreen prompts.
 - j. To restore a deleted HBA or HBA driver, close the Product & Report Information screen by clicking on the *OK* button. Double-click *Component Check* in the *Project Contents* pane. Click on the *Edit Product/Report* button. Click on the HBA tab. The removed HBA driver will be listed. Repeat the HBA selecting steps until all HBA's in the SUT are selected.

2.5.6 Storage Device Information Entry

1. Select the storage devices in the system (this includes hard disk drives, optical media drives, SAN's and backup drives).
 - a. Click on the *Devices* tab.
 - b. Click on the first device listed.

Figure 2-10 Devices Tab





- c. Click *edit* or if the device is unlisted, click *add* in the *Device Tab* window.
- d. Select the appropriate device from the filter list. Any previously selected device will be listed on the screen. If this is the correct device which is in your SUT then click on the displayed device to select it. If the device which is in the SUT is not being listed, then go to step e.

Figure 2-11 Devices Edit/Selection Window

Edit Device Information

Device Model (Detected by OS):
HTS72201

Manufacturer (Detected by OS):
Hitachi

Select a device to be listed with the adapter:

Device Search Filters:
HTS72201

Device list:

Product Name	Manufacturer	Product Type	Product ID	Manufacturer ID
HTS72201, 120 GB, SATA	Hitachi Global Storage Technologies	Hard Disk Drive	636942	229711

Quantity: 1

OK Cancel

- e. Use a search filter for a list of all devices. The filter types can be selected by clicking on the associated radio button on the screen. Below is an explanation of each filter:
 - **Previously Selected** - This is the default filter when the screen is opened. This filter will display all device's previously selected.
 - **Short List** - The device containing all of the auto detected criteria will be displayed.
 - **Long List** - The device/s containing any part of the auto detected criteria will be displayed.
 - **Search all devices** - This is a editable interactive search filter. The editable search field will appear. Enter any information to search on. If no search criteria is entered, then all device's will be listed. You may want to search for part or all of the device or name. For example, to search for an NE 2000, search for NE or 2000. Or search for the *Company* or *ID number*.
 - **Propose New Device (not found in database)** - This is the method used to propose new device. If the device cannot be found, then it must be proposed as a new adapter.
- f. If the device cannot be found with the filters, then it must be proposed as a new device which is not already contained in the SBS database.

- i. Click on the *Propose new device* radio button.
 - ii. Enter the device product name.
 - iii. If the device type listed is not correct, then select the correct device type from the drop down choices.
 - iv. Click on the *Manufacturer* drop down to select the device manufacturer.
 - v. Click OK.
 - vi. After the bulletin submission file is read into SBS, a manufacturer URL will need to be added for the proposed device. See the SBS Users Guide for instructions to add a URL to a proposed device.
 - g. The device quantity will also be automatically filled in. If the device quantity is missing or incorrect, then enter the correct quantity.
 - h. Click OK. Repeat the device selecting steps until all device's in the SUT are selected.
 - i. To remove a device, click on the device and click remove.
2. Continue to Verify Device Information Entry.

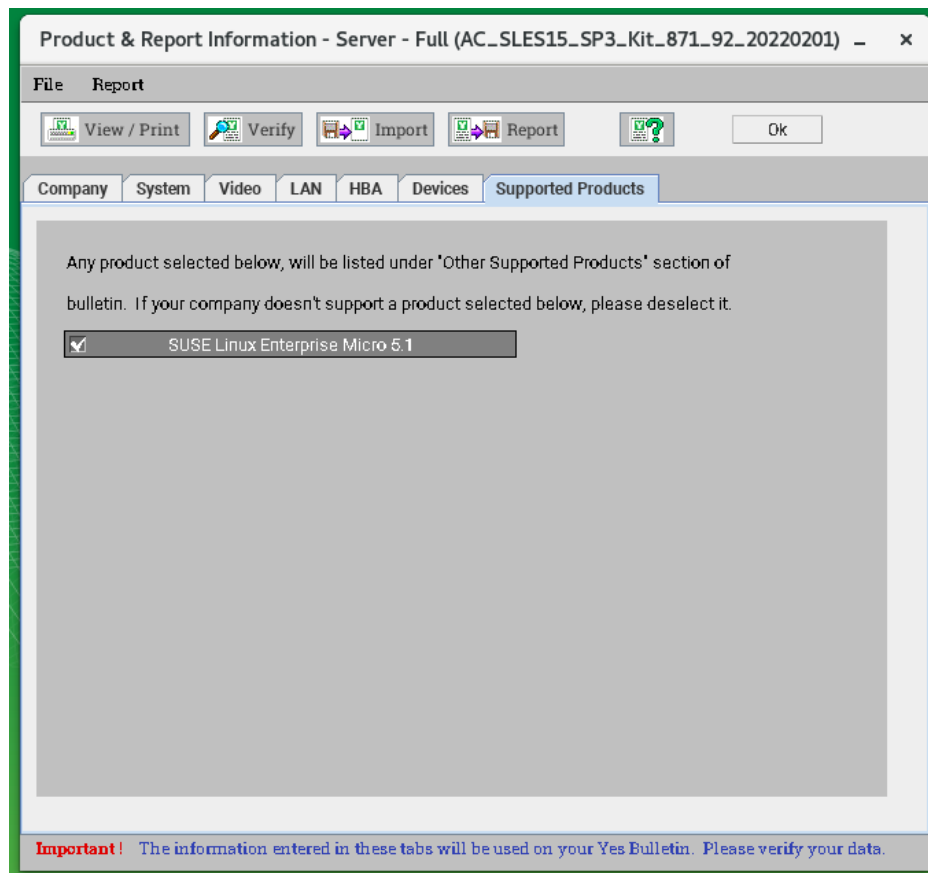
2.5.7 Supported Products Information Entry

This tab allows you to add supported SUSE products onto your bulletin. The applicable SUSE product boxes will be select-able. All grayed out SUSE product boxes means that your system did not meet the minimum requirements to list the grayed-out SUSE product on your bulletin.

1. Click on the boxes which represent the SUSE products which you want listed on your bulletin.

Figure 2-11 Supported Products Screen





2. Continue to Verify Device Information Entry.

2.5.8 Verify Device Information Entry

Check for hardware that has not been added to the SUT hardware information list.

1. Click *Verify* in the Product & Report Information window to review the Errors.
2. If there are any "ERROR ... Missing...:" messages do the following:
 - a. Write down the missing devices.
 - b. Follow the instructions in section 2.5... to add all missing System, Company, LAN, HBA, Video or Device information.
 - c. Click *OK* to close the Exception Information window.
 - d. Repeat for each driver ERROR:...missing... message.



3. Once all missing hardware has been added, click *OK* in the *Product & Report Information* window.

2.6 Saving the Test Project

1. Click on *Save* (at the top of the screen) to save the project.
2. Begin testing the system now according to the requirements for the test project.
3. Follow the testing instructions in the next section for the testing that you will perform.
4. Run the tests in the order listed in this document.

During testing, TestConsole may prompt the tester for IP addresses, usernames, passwords, and user directory context for the SUT. We have not documented all on screen prompts for each individual test. The answers to the on-screen questions should be obvious. If your SUSE DS contract includes support from an assigned SUSE engineer, you may contact that engineer for additional assistance.

3 SLES Tests

Running the Tests

If you did not reboot the SUT after installing the test kit then please do so now, before starting any server tests. The tests all begin with an **Untested** result. Most tests in this section have 5 possible testing outcomes, pass, fail, pass w/warning, not applicable, and not supported. Below is an explanation of the possible outcomes.

PASS test result – indicates that the tested configuration has completely passed the testing requirements.

PASS w/WARNING test result – indicates that the tested configuration has passed the testing requirements but may have configuration issues which are in question. A PASS w/WARNING test result will need to be reviewed by a SUSE engineer when the test results are submitted. If there were warning messages on the SUT during the test, review these messages with regards to your hardware.

FAIL test result – indicates that the tested configuration has failed the testing requirements. There are many possible reasons. This may be due to improper configuration or steps missed during installation, setup or testing.

NOT APPLICABLE test result – indicates that the test does not apply to the tested configuration.

NOT SUPPORTED test result – indicates that the test cannot be run because the functionality is not supported by the hardware. This test result typically requires a configuration note on the bulletin.

3.1 Manual Tests

The manual tests will require user interaction to complete. Read each tests instructions carefully before running the test. Each manual test is listed in this section in the order which it is displayed in the test project.



3.1.1 Video Test

Test Overview: This test is for all systems. Please test with the video adapter which you want listed on the bulletin. This must be the video adapter which is in the system at the time when the OS is installed. All video ports in the video adapter must be connected during the complete testing cycle. For headless systems the test will return Not Applicable.

Test Objective: Verify that the display sleep, screen saver and other functionality works on the system.

1. Double-click Video Test in the TestConsole project for the SUT.
2. Follow the on-screen instructions in the new console window that appears on the SUT.

3.1.2 Speaker Test

Test Overview: This test is required for systems which support audio output, or which have built in speakers. The test is disabled by default and must be enabled. To enable the speaker test double click on Enable Speaker test located under the SUT IP Address near the top of the project contents.

Test Objective: Verify that the sound card and speakers are compatible with the OS.

1. The speaker test is disabled by default and must be enabled to be available. To enable the speaker test double click on Enable Speaker Test located under the SUT IP Address near the top of the project contents.
2. Double-click the *Speaker Test* in the TestConsole project for the SUT.
3. Follow the onscreen instructions in the new console window that appears on the SUT.

3.1.3 Optical Device Tests Overview

Test Overview: The Optical Device Tests are always required. The Optical Device Tests will detect and test all optical devices which are directly connected to the SUT. If the SUT does not have an optical device, then the test will return the test result of "NOT APPLICABLE". Virtual optical devices (Virtual DVD, Virtual CD, etc) will not be tested but will cause a "PASS"



w/WARNING” result. Do not attach a USB optical device for this test unless the USB optical device ships with the system.

Test Objective: Verifies that the optical devices function correctly with the other devices in the system. YES Certification requires that the most capable functionality of each optical device be tested. The most capable function is always write capability.

Optional Capability Check:

1. The capabilities of the optical device can be determined before testing the devices.
2. Determine the capabilities of the optical device by looking up the specs on the device.
3. Place the appropriate media into each optical device. See table 2-2 below to determine which media to place into the optical media device.

Note: If a SUSE Hardware Detection pop up window appears, place a check mark next to Do not ask again and click No or Cancel to not open the application.

- a. During the testing the test will prompt on SUT if the wrong media is in the optical media device.
 - b. Incorrect media will result in a test failure within several minutes.
4. If the test fails due to incorrect media, simply replace the media with the correct media then restart the optical media test.

Table 2-2 CD-ROM/DVD Test Matrix

Drive Features	Media to Place In Drive
CD (Read only, no write ability) on it	Test with CD media with 600MB or more of data
CD-RW	Test with blank CD-RW media
CD-R	Test with blank CD-R media



DVD (Read only, no write ability) it	Test with DVD media with 3GB or more of data on it
DVD-RW	Test with blank DVD-RW or DVD-R media
DVD+RW	Test with blank DVD+RW or DVD+R media
DVD-R	Test with blank DVD-R media
DVD+R	Test with blank DVD+R media
No Features line found	See info file in <code>/proc/sys/dev/cdrom/info</code> for detected features.
Blu-ray	Blu-ray is not supported on SLE. Please test a DVD instead.

Note: Please verify that the write speed of the CD or DVD writable media matches the optical drive write speed. If the write speed of the media is slower than the write speed of the optical drive, the test may fail.

3.1.4 Optical Verify/Write Test

Test Overview: This test will exercise the optical devices write capability. If the SUT does not have an optical device with write capability, then the test will return the test result of "NOT APPLICABLE". This test is required to be completed prior to the stress tests on all systems. Do not remove the written media after the test has completed. Once the test has completed the written media will be used for the Optical Read Test during the 12 hour stress tests. Blu-ray is not supported in SLE, please use a DVD for testing Blu-ray devices. Do not attach a USB optical device for this test unless the USB optical device is included with the system.

Test Objective: Verify that the optical write capability functions correctly with the OS.

1. Determine if the optical device supports auto-trayclose.
 - a. On SUT type `eject <Enter>` at the command line to eject the CD/DVD.
 - b. On SUT type `eject --trayclose <Enter>` at the command line to close the tray. If the tray closes and the command does not return an error, then auto-trayclose is supported.

Note: IMPORTANT: If the optical device does not support auto-tray close then the tester will need to manually close the tray during testing.



2. On the SUT place a blank writable (or rewritable) media that supports the maximum write speed of the drive into each optical media device. If prompted, cancel at the choose what application to open prompt.
3. Double-click the Optical Verify/Write Test. The Test will begin. Messages generated during this test will pop up on the TC.

3.1.5 Hibernate Test

Test Overview: This test is optional for SLES testing.

Test Objective: Verify that the OS can correctly put the machine into and recover from hibernation mode.

1. Double-click the Sleep Test in the TestConsole project for the SUT.
2. Follow the on-screen instructions in the new console window that appears on the TC. If the Hibernate test fails, then the workaround is to answer Y and type "systemctl hibernate" at the SUT Console.

3.1.6 Sleep Test

Test Overview: This test is optional for SLES testing.

Test Objective: Verify that the OS can correctly put the machine into and recover from sleep mode.

1. Double-click the Sleep Test in the TestConsole project for the SUT.
2. Follow the on-screen instructions in the new console window that appears on the TC. If the sleep test fails, then the workaround is to answer Y and then type "systemctl suspend" from a SUT Console.



3.1.7 Memory Persistence Test

Test Overview: This test is required for SLES testing.

Test Overview: The Memory Persistent Test will test the ability of Persistent Memory modules (NVDIMM) to store and retain information in a non-volatile method. The server will be powered off and rebooted during the test. This test can be run at the same time as the Kdump test. After the testing passes and test results are submitted into SBS a config note must be added to the bulletin submission as follows: Persistent Memory: The Persistent Memory in the system was configured in AppDirect Mode only. Requirements: System with Persistent Memory modules, SLES 15 SP6 or SLES 12 SP6 or newer OS. To begin the testing do the following:

1. Double-click Memory Persistence Test in the TestConsole project for the SUT. The kdump test may also be double clicked on to run both tests at the same time.
2. Follow the on-screen instructions in the new persistent memory test window/s which appear on the TC. If you are planning to run this test and the kdump test at the same time, then there will be a prompt in the persistent memory test window indicating to start the kdump test. After this prompt the persistence memory test window will contain plus (+) signs until the kdump test is started. Over time the plus signs will fill the persistent memory test window while waiting for the kdump test to start and the kdump message will be pushed off of the persistent memory test window. After the kdump test is started the plus signs will change to minus (-) signs while the SUT is disconnected for the kdump reboot.

3.1.8 Kdump Test

Test Overview: This test will need between 5 GB of disk space and the equivalent to the amount of RAM in the system of free disk space. The amount of free disk space needed depends on the amount of RAM in the system. SLES will need more space on the / (root) than there is RAM for the test to properly run. If the Kdump test fails then the Kdump memory setting may need to be increased, see the troubleshooting and help document for instructions to increase the kdump memory.

Test Objective: Verify that the OS and hardware can correctly perform a kernel crash dump (kdump).

Note: Kdump is not supported on secure boot systems (when secure boot is enabled).



1. Double-click the *Kdump Test* in the TestConsole project for the SUT.
2. Follow the on-screen instructions on TC. The onscreen instructions will direct the tester. A reboot may occur multiple times to perform and complete the kdump test.

3.19 GPU Compute Test

Test Overview: This test will check the GPU's ability to compute. This is NOT a video test. Run this test only if you have a compute GPU/DPU. To run this test your TC will need Internet access for the GPU test to be downloaded. To properly set up a NIC in the TC so that the test kit will know not to test it, please follow the steps in the section titled "Dealing with Unused NIC ports on the TC" in the TestConsole Setup and Configuration document.

1. This test is enabled by default.
2. Double-click the GPU Compute test.
3. If the GPU Compute test fails reboot the SUT then run the GPU Compute test again.
4. Run the component test again after the GPU Compute test has been run. The newly installed GPU drivers will be detected by the component check test, this will allow the GPU drivers to be listed on the YES Certification bulletin.

If you would like to manually download and install the Nvidia cuda files then follow the steps below:

1. Goto <https://developer.nvidia.com/cuda-toolkit>
2. Click on the green box "Download now".
3. Click on the "Linux" Operating System box.
4. Click on the Architecture(x86_64 or arm64-sbsa) of your SUT.
5. Follow the instructions below for the Architecture which you have chosen.
 - a. For the x86_64 Architecture click on the SLES box. Click on the Installer Type which you want to use (rpm local, rpm network, runfile). Follow the onscreen instructions.
 - b. For arm64-sbsa click on the Native box then click on the SLES box. Click on the Installer Type which you want to use (rpm local, rpm network, runfile). Follow the onscreen instructions.

3.2 Automated Tests

The automated tests will run without any user interaction. Each automated test is listed in this section in the order which it is displayed in the test project.



3.2.1 Serial Port Test

Test Overview: This test is for systems with serial ports. This test is run independently from all other tests.

Test Objective: Verify that the Serial Port functions in the system.

Important: When assigning IP addresses to the NICs, do not use the range 192.168.101.0 through 192.168.101.255. These IP addresses are used in the Serial Port Test.

1. Connect the SUT serial port 1 and TC serial port 1 using a serial crossover cable or a serial null modem cable.

Note: Note: Com port 1 must = ttyS0 and have a speed setting of 115,200. We have had success using settings 3f8 and IRQ4.

2. Double-click Enable Serial Port 1 Test in the TestConsole project for the SUT.
3. Double-click the Serial Port 1 Test to begin the test.

Note: If the serial port test is experiencing problems, then please refer to the serial port debug section in the Troubleshooting and Help SCK documentation.

3.2.2 CPU Frequency Test

Important: Ensure that the Auto Frequency (different vendors have different names for this) changing is enabled in the system setup. This test may take more than 10 minutes depending on the number of CPU cores in the system.

Test Overview: This is a fully automated test, there will not be any user interaction required.

Test Objective: Verify that the OS can change and monitor CPUs that support multiple frequencies.

1. Double-click the CPU Frequency Test in the TestConsole project for the SUT.



3.2.3 CPU Hot Plug Test

Test Overview: This test is required. It is a fully automated test, there will not be any user interaction required.

Test Objective: Verify that the OS can change CPUs.

1. Double-click the CPU Hot Plug Test in the TestConsole project for the SUT.

3.2.4 Memory Hot Plug Test

Test Overview: This test is optional. It is a fully automated test, there will not be any user interaction required.

Test Objective: Verify that the OS can change memory with this server.

1. Double-click the Memory Hot Plug Test in the TestConsole project for the SUT.

3.2.5 Watchdog Timer Test

Test Overview: On most systems this is a fully automated test. In some cases, there will be user interaction required. Important: Some hardware vendors may be required to manually install the watchdog driver. See Troubleshooting and Help SCK documentation for more information.

Test Objective: Verify that the processes are running without incidents.

1. Double-click the Watchdog Timer Test in the TestConsole project for the SUT.

3.2.6 Firmware BIOS Test

Test Overview: This test is optional. It will test the BIOS/firmware. Several tests are used in the Firmware BIOS Test. We use the tool FWTS (Firmware test suite) which was developed by Intel and other hardware partners. The FWTS website URL is <https://launchpad.net/fwts>. If this test fails, then look through the test log file to determine what needs to be fixed in your



BIOS/firmware. For more information about evaluating the Firmware BIOS Test, see the Test kit Troubleshooting and Help documentation section for the Firmware BIOS Test.

Test Objective: Verify that the BIOS/firmware is compatible with the OS.

1. Double-click Firmware BIOS Test in the TestConsole project for the SUT.

3.2.7 Verify Setup NIC

Test Objective: Verify that the NIC configuration is correct including LAN speeds and IP addresses. All NIC adapters and all WiFi adapters in the system are required to be configured and tested. This test must pass before starting the stress tests.

1. Each NIC IP addresses will be auto detected. Each IP Address must be on an independent network. Ensure the IP address for the NIC is correct. Below are the default IP addresses and listed as examples.
 - SUT NIC 1 (default) IP address 10.1.1.1
 - TC NIC 1 (default) IP address 10.1.1.2
 - SUT NIC 2 (default) IP address 10.1.2.1
 - TC NIC 2 (default) IP address 10.1.2.2
 - SUT NIC 3 (default) IP address 10.1.3.1
 - TC NIC 3 (default) IP address 10.1.3.2 and so on.
2. Double-click *Verify Setup NIC* in the TestConsole project for the SUT.
3. Test explanations: The Verify Setup NIC test will take a few minutes to complete. If the test fails, troubleshoot the NIC setup by reviewing the configuration information in the TestConsole Document to ensure that the hardware is set up correctly. A **"PASS w/WARNING"** result may indicate that the SUT NIC speed is not detectable with ethtool. If the SUT NIC speed is not detectable with ethtool then the tests are unable to verify that the network configuration is setup correctly.

3.2.8 Verify Time Sync Setup

Test Objective: Verify that the time is correctly synced between the SUT and the TC. This test must pass before starting the stress tests.

1. Ensure that the IP address for the adapter is correct.



- SUT NIC 1 (default) IP address 10.1.1.1
 - TC NIC 1 (default) IP address 10.1.1.2
2. The following needs to be done on SUT.
 - a. On SUT open a Terminal.
 - b. If your using SLES 15 SP6 type chronyc sources <Enter>, otherwise type ntpq -p <Enter>.
 - c. The onscreen output should be as one of the examples below:

```
remote      refid      st  t   when  poll  reach  delay  offset  jitter
=====
*10.1.1.2    LOCAL(0)    11  u    343   1024   377    2.109  -1.076  0.891
```

Interpretation of relative output: "remote" needs to be the IP address of TC. The "*" in front of the remote IP address and "reach" of 377 means that everything is synced up correctly.

```
MS Name/IP address  Stratum    Poll  Reach  LASTRx    Last Sample
=====
^*10.1.1.2          6          5     377     14        +13us[ +13us +/- 11ms
```

Interpretation of relative output: "MS Name/IP address" needs to be the IP address of TC. The "^*" in front of the remote IP address and "reach" of 377 means that everything is synced up correctly.

- d. If the time is not synchronized, then check the configuration and the IP addresses. After boot, the time synchronization can take up to 30 minutes. The average time synchronization is about 10 minutes. Close the ntpq window once the time is synced.
3. Double-click Verify Time Sync Setup in the TestConsole project for the SUT. If the test fails, then follow the onscreen instructions. If the onscreen instructions do not solve the problem, then see the Time Sync troubleshooting section of the Troubleshooting and Help document.



3.3 Stress Tests

Test Overview: As each test is set up, the actual test will be added into a folder called Stress Tests in the Project Contents pane. The stress tests will be started at the same time and run together to stress the overall system more efficiently and reduce testing time. After all testing is complete the Get Test Logs Test is the final test. Do not run the Get Test Logs Test until all testing is completed. If you have persistent memory in the system which is configured in Appdirect mode, you may now change it to test in memory mode. Testing in memory mode will allow you to have the following config note: Persistent Memory: The Persistent Memory in the system was configured in Memory Mode.

3.3.1 Memory/CPU Test

Test Objective: Verify that the CPU's and memory function correctly under stress for an extended amount of time. This test does not require any setup.

3.3.2 Hard Disk/RAID Test

Test Overview: The Hard Disk/RAID device test is always required. The Hard Disk/RAID test will detect and test all Hard Disks and/or hardware RAID devices which have a mountable partition. The hardware RAID testing is for hardware RAID only, it is not intended for testing software RAID. This test will exercise SCSI, SATA, eSATA, SAS, IDE and Fibre Optic connected devices. If the SUT does not have a Hard Disk/RAID device, then the test will return the test result of "NOT APPLICABLE".

Test Objective: Verify that the Hard Disk or RAID and driver functions correctly with the system.

1. If you want to list an eSATA port on the bulletin, then connect the eSATA device to the eSATA port. The eSATA device must be tested during the YES certification stress tests. See "USB Test Setup" instructions to format external drives.
2. This test is enabled by default and will run with the stress tests.

3.3.3 NIC Test

Test Objective: Verify that the NIC's function correctly under stress for an extended amount of time. All NIC adapters and all WiFi adapters in the system are required to be configured and tested. The Verify Setup NIC tests are required to be run and pass prior to starting this test.



If the test fails, troubleshoot the NIC setup by reviewing the configuration information in the TestConsole Document to ensure that the hardware is set up correctly. A "PASS w/WARNING" result may indicate that the SUT NIC speed is not detectable with ethtool. If the SUT NIC speed is not detectable with ethtool then the tests are unable to verify that the network configuration is setup correctly. The switch and the NIC's in the TC must match the highest speed NIC's in the SUT.

3.3.4 Time Sync Test

Test Objective: Verify that the time remains synced between the SUT and the TC. This test does not require any setup.

3.3.5 Optical Read Test

Test Overview: This test is required to be run on all systems. If the SUT does not have any optical devices, then the test will return a test result of "NOT APPLICABLE". Blu-ray is not supported in SLE, please use a DVD for testing in Blu-ray devices. This test will exercise the read capabilities of all optical devices attached to the SUT. Do not remove any written media created from the Optical Verify/Write Test, it will be used during this Optical read test. Do not attach a USB optical device for this test unless the USB optical device ships with the system.

Test Objective: Verifies that the Optical devices function correctly with the other devices in the system.

1. This test is enabled by default and will run with the stress tests. Messages generated during this test will pop up on the TC.

3.3.6 USB Test

Test Overview: The USB device test is always required. If the SUT does not have a USB controller then the test will return the test result of "NOT APPLICABLE". The USB test will detect and test all USB devices which have a mountable partition. This test is intended for exercising 2 USB storage devices connected to the SUT. If the SUT has 2 USB ports, then plug a USB device into each port.

When a USB keyboard or a USB mouse is using one of only the 2 USB ports then an external USB hub is required to ensure that 2 USB storage devices are tested. A USB Keyboard, or a USB Mouse and USB hard drive can be plugged into the USB hub and the other USB hard drive is



plugged into the other USB port. If the SUT has only 1 USB port, then only 1 USB storage device must be tested. The volume name on the USB storage device must not have any spaces in the name.

Test Objective: Verifies that USB ports function correctly with other devices in the system.

1. The USB storage device needs to be formatted and partitioned for Linux. If the USB storage device has already been partitioned using the procedure below, then you do not need to format the USB storage device again. The USB storage device only needs to be partitioned once using the below procedure. To format the USB device, follow the steps below.
 - a. Plug the USB device into the TC. Open a terminal prompt then type `yast2 disk<Enter>`.
 - b. Click Yes at the warning.
 - c. Double click on the USB storage device (e.g., `/dev/sdb` or `/dev/sdc`).
 - d. Click Delete to remove existing partitions on the USB storage device.
 - e. If prompted click Continue at the warning screen about unmounting the drive.
 - f. Click Yes to really delete the partition.
 - g. If prompted click Continue to unmount the drive.
 - h. Click Add to create a new partition on the USB storage device.
 - i. Click the Primary Partition radio button then click Next.
 - j. Click the Maximum Size radio button then click Next.
 - k. Click Next, for the default Role (Data and ISV Application).
 - l. Choose XFS from the file system drop down, then click Finish (while in the add partition screen).
 - m. Click Next on the Expert Partitioner screen. Click Finish on the summary screen. The formatting will begin.
 - n. Unplug the USB storage device from the TC.
2. Connect the USB storage devices to the SUT. If there are USB ports on the front and the back of the SUT, then plug one USB storage device (or flash drive/thumb drive) into the front USB port and the other USB storage device (or flash drive/thumb drive) into a back USB port. If prompted to open a new hard disk, click No.
3. This test is enabled by default and will run with the stress tests.



3.3.7 Error Check Test

Test Objective: Verify that there were no system errors during the 12 hour stress tests. This test does not require any setup.

3.4 Starting the Stress Tests

Test Objective: Verify that all system devices function correctly together in a high load situation for an extended period of time. All tests in the *Stress Tests* folder must be started within 1 hour of the first *Stress Test* which is started, or the *Verify Stress Tests* will fail. If all *Stress Tests* are not started within 1 hour of each other, then all *Stress Tests* should be canceled. After the *Stress Tests* are canceled and no longer listed in the testing run queue window, the 12 hour *Stress Tests* should be completely restarted. All *Stress Tests* must run concurrently for a minimum of 11 hours together, or 3 hours together during the reduced testing project.

1. Double-click the Stress Tests folder.
2. Click "Continue" in response to the "Verify run" pop-up window. This will start all of the stress tests which were set up.
3. Wait 15 minutes and check if any of the tests have failed.
4. If any tests have failed within the first hour:
 - a. Correct the problem (see "Troubleshooting and Help Documentation").
 - b. Restart the failing test within the first hour by double clicking on the failed test.

3.5 Verify Stress Tests

Test Overview: This test is required for all systems. This test will ensure that all stress tests were run as expected and according to the testing policy.

1. After the Stress Tests have completed double-click the *Verify Stress Test* to begin this test.



3.6 Evaluating the Results of the Stress Tests

1. After all the tests have completed, check to see if any tests have failed.
2. If a test has failed, check the test configuration setup then return to the Section entitled, "Starting the Stress Tests". All tests must be run in parallel as defined in the section entitled, "Stress Tests".

3.7 Post-Testing Cleanup

1. If USB storage devices were used during testing, then safely remove them from the SUT.
2. If CD/DVD media was used during testing, then safely remove it from the SUT.

3.8 Get Test Logs

Test Overview: This test is required for all systems. This test will gather all test logs in preparation for the creation of the test results submission file.

1. Double-click *Get Test Logs* in the TestConsole project for the SUT. This test can take time to complete. We have seen systems with 5 TB of RAM take 2 hours to complete this test.

Important: Do not run the *Get Test Logs Test* until all testing is completed.

2. If prompted answer the on-screen questions.
3. Continue to section "Creating the Bulletin Submission File".

3.9 Creating the Bulletin Submission File

Overview: We refer to the test results .zip file as the bulletin submission file or sometimes the submission file. The bulletin submission file is used to create the Yes Certification Bulletin in the SUSE Bulletin System (SBS). The steps in this section will create the bulletin submission (.zip) file which you will read into SBS to create the Yes Certification Bulletin.

1. Open the project file. If the project file is already opened, skip to step 2.



Note: If the project file is already open and you have just completed the tests, save the project before creating the bulletin submission (.zip) file.

- a. Click the *TestConsole* icon on the desktop
 - b. Click *Project > Open Test Project > Existing*.
 - c. Select the appropriate project.
 - d. Click *Select* to open the project.
 2. Create the bulletin submission (.zip) file.
 - a. Click *Edit Product/Report*.
 - b. Click *Report*.
-

Important: If the Report Error window appears, continue to step 3. If not, proceed to step 4.

3. Report errors.
 - a. Click on the x in the upper right corner of the Report Error window to close the window.
 - b. Click *Verify*.
 - c. If the status column in the Exception Information window status is Failure this will stop you from creating a bulletin submission file. Failures must be resolved even after an explanation is added. To resolve the Failures related to missing components please repeat the steps in section 2.5 Product and Report Information Entry.
 - d. Click an exception in the scroll window.
 - e. Click *Edit Explanation*.
 - f. Enter the explanation.
 - g. Click *OK* in the explain exception window.
 - h. Repeat steps c through f until all unresolved exceptions are explained.
 - i. Click *OK* in the Exception Information window.
 - j. Click *Report*. If the screen appears stuck, then click on the terminal screen at the bottom then click inside the screen.
4. Complete the creation of bulletin submission (.zip) file.



- a. We recommend keeping the existing project filename; however another filename can be used.

Note: Do not put spaces in the file name.

- b. Click *Save* to generate the bulletin submission (.zip) file.
 - c. Click *Finish* or *View Report Summary* to view the reported information in a browser.
 - d. If a browser window is open to view the Report Summary, then close it.
 - e. Click *OK* to exit the Product and Report Information window.
5. Copy the bulletin submission (.zip) file from the `/opt/suse/testKits/system/results` directory to a USB Flash drive or CD or Network. For example: if copying the bulletin submission (.zip) file to a USB thumb drive, at a terminal prompt on TC type: `cp <bulletin submission (.zip) file> /media/usb<Tab> <Enter>`.
 6. Continue to section "Submitting the Bulletin Submission File into SBS".



3.10 Submitting the Bulletin Submission File into SBS

We use a database called the SUSE Bulletin System (SBS) to generate and manage the SUSE Yes Certification Bulletins. The Steps below will help you to read the bulletin submission .zip file into SBS and begin the bulletin creation process.

1. Open a web browser the SUSE Bulletin System (SBS). The URL is:
<https://www.suse.com/nbswebapp/yesCert.jsp>
2. Login into SBS.
3. Read the bulletin submission file (.zip) into SBS.
 - a. Click on **New Submission**, then browse to your bulletin submission file (.zip).
 - b. Click **Upload**.
4. The bulletin is now in the SBS system. There is still work to do on the bulletin submission while in SBS.
 - a. In the SBS User Guide read through the Overview part of the bulletin States section.
 - b. Afterward go to section F.2 of the SBS User Guide for the instructions to move the bulletin from Open State to Review for processing.
 - c. If you cannot access SBS, then contact your SUSE Partner Engineering contact for SBS access.



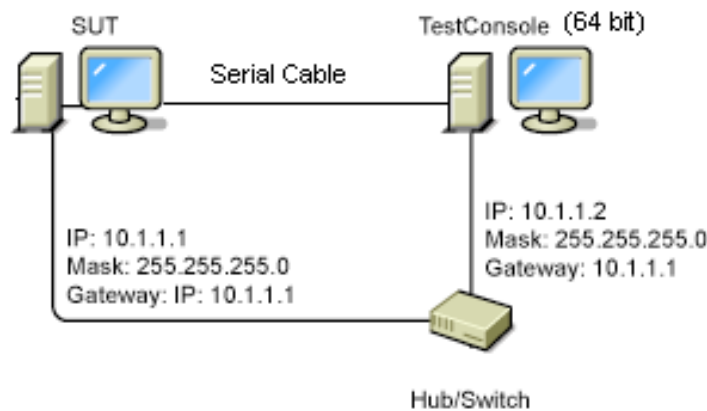
4 Manually Installing SLES

This section covers the following topics for manual OS installations:

- Section 4.1, “Configuring the Hardware for SLES Testing”
- Section 4.2, “Manually Installing SLES 15 SP6 on SUT”
- Section 4.3, “Manually Installing SLES 12 SP5 on SUT”
- Section 4.4, “Starting the Tests”

4.1 Configuring the Hardware for SLES Testing

Figure 4-1 Hardware Configuration for the SLES Testing



Important: When assigning IP addresses to the NICs, do not use the range 192.168.101.0 through 192.168.101.255. These IP addresses are used in the Serial Port Test.

4.2 Manually Installing SLES 15 SP6 on SUT

1. Make sure the NICs in the TC match the highest speed NIC in the SUT.
2. Delete all existing partitions from all hard drives. Section “A.1.1 Removing the ELIO Boot Tables” has instructions which will delete any and all existing partitions. If this is a PXE manual installation skip to step 7.
3. Create a SLE 15 SP6 bootable Installation thumb drive to be used to install SLES 15 SP6 onto the SUT. You will need at least a 16 GB drive. The OS will use about 12 GB of disk space on a hidden partition which is created. The process may take minutes to complete.
 - a. Make sure that the SLE 15 SP6 ISO Image is copied onto the TC hard drive.
 - b. Plug the Thumb drive into the TC.
 - c. Open a terminal.
 - d. Type `dd if=PATH_TO_SLE_15_SP6_ISO_IMAGE of=USB_STORAGE_DEVICE bs=4M`.
 - e. After the bootable thumb drive creation is completed, unmount and remove the thumb drive.
4. Plug the SLES 15 SP6 bootable installation thumb drive into your SUT.
5. Boot your SUT to the SLES 15 SP6 bootable installation thumb drive.
6. Select *Installation* <Enter> (before the 20 second timeout expires).

For a PXE manual install start here:

7. If prompted click No to the Network is not configured...message in the Updating the installer screen.
8. Select the English (US) language and English (US) keyboard Layout.
9. Under the Product to Install click on the SUSE Linux Enterprise Server 15, then click Next.
10. Select I Agree to the License Terms, then click Next.
11. If prompted click Next in the Network Settings screen. The network will be set up in the next section during the Test Kit installation on this SUT.
12. Click the Skip Registration radio button on the Registration screen.
 - a. Click OK at the registration warning prompt, then click Next.



13. Select the packages below to be installed on the Extensions and Modules Selection screen. You may select any additional needed modules to install. Some systems with Wifi need workstation extensions installed for the Wifi to work.
 - ✓ Basesystem Module
 - ✓ Desktop Applications Module
 - ✓ Development Tools Module
 - ✓ Legacy Module
 - ✓ Server Applications Module
 - a. Click next.
14. Click next at the Add-on Product Installation screen.
15. If prompted, click Next on the System Role screen.
16. Click Next on the Suggested Partitioning screen. If previous OS installs failed, then use the following steps on your system.
 - a. Click on Guided Setup.
 - b. If prompted with the Select Hard Disk Screen, click on the Choose What To Do With Existing Partitions drop down field then select Remove even if not needed. For the Choose What To Do With Other Partitions drop down field select *Remove even if not needed*.
 - c. Click on Next.
 - d. Click on Next on the Partitioning scheme screen.
 - e. Click on Next on the Filesystem Options screen.
 - f. Click on Next on the Suggested Partitioning screen.
17. Adjust the region and time zone to match your region and time zone.
 - a. Click on your region in the Region pull down menu on the left side or click on your time zone in the map.
 - b. Click on your time zone in the Time Zone pull down menu on the right side or click on your time zone in the map.
18. Set the system clock to match the time of the other systems on your test rack.
 - a. Click the Other Settings button.
 - b. Change the Current time and Current date to be the same as the TC time and date.



- c. Click the Accept button.
 - d. Click the Next button to complete the setup of the Clock and Time Zone screen.
- 19. Configure the authentication (Local User).
 - a. Click the Skip User Creation radio button on the Local User screen.
 - b. Click Next in the Local User screen.
- 20. Set the Password for the System Administrator user root.
 - a. Type suse in both fields for the System Administrator root user password.
 - b. Click Next.
 - c. Click Yes in The password is too simple message window.
- 21. Disable the firewall by clicking on disable next to firewall will be enabled. The display will change to firewall will be disabled.
- 22. Enable the SSH service by clicking on enable, located next to SSH service will be disabled. The display will change to SSH service will be enabled.
- 23. Click Install to start the installation.
- 24. Click Install in the Confirm Installation window.
- 25. The file copying will begin. After the OS installation completes, the system will restart.
- 26. Proceed to Section 4.4 "Starting the Test".

4.3 Manually Installing SLES 12 SP5 on the SUT

The NICs in TC must match the highest speed NICs in the SUT.

1. Delete all existing partitions from all hard drives. Section "A.1.1 Removing the ELIO Boot Tables" has instructions which will delete any and all existing partitions. For a DVD installation do the following, if this is a PXE manual installation skip to step 4:
2. Boot the system to SUSE LINUX Enterprise Desktop 12 (latest support pack) from DVD.
3. Select Installation<Enter> (before the 20 second timeout expires).



For a PXE manual install start here:

4. If prompted click No to the Network is not configured...message in the Updating the installer screen.
5. Select the English (US) language and English (US) keyboard Layout.
6. Select I Agree to the License Terms, then click Next.
7. If prompted click Next in the Network Settings screen. The network will be set up in the next section during the Test Kit installation on this SUT.
8. Click the Skip Registration radio button on the Registration screen.
 - a. Click OK at the registration warning prompt.
 - b. Click Next.
9. If prompted click Next in the Add On Product or Media Type or Installation Options screen.
10. For a base SLES 12 SP5 install (not KVM or XEN) click Next in the System Role screen. For XEN or KVM click the appropriate box.
11. The default manual SLES installation does not allocate enough space on / (root) to perform the kdump test, so the partition needs to be changed.
 - a. Click "Edit Proposal Settings".
 - b. Uncheck "Propose Separate Home Partition".
 - c. Click OK.
 - d. Click Next.
12. Adjust the region and time zone to match your region and time zone.
 - a. Click on your region in the Region pull down menu on the left side or click on your time zone in the map.
 - b. Click on your time zone in the Time Zone pull down menu on the right side or click on your time zone in the map.
13. Set the system clock to match the time of the other systems on your test rack.
 - a. Click the Other Settings button.



- b. Change the Current time and Current date to be the same as the TC time and date.
 - c. Click the Accept button.
 - d. Click the Next button to complete the setup of the Clock and Time Zone screen.
- 14. Configure the authentication.
 - a. Click the Skip User Creation radio button on the Local User screen.
 - b. Click Next in the Local User screen.
- 15. Set the Password for the System Administrator user root.
 - a. Type suse in both fields for the System Administrator root user password.
 - b. Click Next.
 - c. Click Yes in the password is too simple message window.
- 16. Disable the firewall by clicking on disable next to firewall will be enabled. The display will change to firewall will be disabled.
- 17. Enable the SSH service by clicking on enable, located next to SSH service will be disabled. The display will change to SSH service will be enabled.
- 18. If listed, enable an SSH port by clicking on open, located next to SSH port will be blocked. The display will change to SSH port will be open.
- 19. Click Install to start the installation.
- 20. Click Install in the Confirm Installation window.
- 21. The file copying will begin. After the OS installation completes, the system will restart. After the restart, leave the OS DVD in the SUT. The test kit installation will use the OS DVD.
- 22. Proceed to Section 4.5 "Starting the Tests".

4.4 Starting the Tests

1 Begin at section "2.1 Creating a New Test Project" for SLES Pre-Testing and Preparation.



5 System Test Kit Revision History

Date	Description
February 2024	Updated the document for SLES15 SP6 and test kit 9.0.
May 2023	Added manual cuda download steps to GPU compute test section.
April 2023	Added information to the GPU compute steps.
March 2023	Added a clarification step to section 3.9 Creating the Bulletin Submission File.
January 2023	Update the document for the 8.8 Test kit. Updated the Utah address.
August 2022	Changed the Persistent Memory setup instructions. Changed other persistent memory information.
June 2022	Changed filename length limit instructions from 70 to 58. Updated doc page size to 8.5 x 11.
May 2022	Added note for Verify Setup NIC tests regarding 25 GB speed and above test failure.
April 2022	Changed CPU Hot Plug test to be a required test. Updated the manual install and changed the IP address configuration steps.
March 2022	Moved the new GPU Compute test instructions to the Manual Tests section.
February 2022	Updated the documentation for the 8.7 Test kit. Changed SLES 15 SP3 to SLES 15 SP4. Migrated to the latest SUSE branding. Removed Ports and Bus types from the documentation to match 8.7 test kit. Removed the Persistent Memory Test. Added the New GPU Compute test to the stress tests section. Moved the Wi-Fi configuration steps to the Creating a New Test Project section.
May 2021	Added more Persistent Memory configuration information to the section entitled: "Configure the Persistent Memory Modules".
April 2021	Enable Component Check test was added back to the 8.6 test kit and to this document. Persistent Memory test was moved back to the stress tests.
March 2021	Enable Component Check test was removed from the 8.6 test kit and from this document. Changed testing order to match 8.6 test kit. Persistent Memory test was moved.
March 2021	Changed the doc to version 8.6. Changed SLES 15 SP2 to SLES 15 SP3.



May 2020	Added video adapter information in the minimum requirements section and in the video adapter test section.
April 2020	Added section 2.4.8 Supported Products Entry. Removed Copy Kit to SUT Test section. Upgraded diagram figure 1-1 to reflect wireless configuration. Re-numbered all figures.
March 2020	Changed the doc to version 8.5. Changed SLES 15 SP1 to SLES 15 SP2.
January 2020	Updated copyright to 2020. Made minor corrections and changes. Removed the floppy test.
November 2019	Updated the Setup Verify NIC test and the IP Address setup section.
October 2019	Removed discontinued a discontinued product from the documentation.
September 2019	Made changes to the 3.3.1 Persistent Memory Test section. Added more configuration information for persistent memory. Updated the YES Program Guide URL.
July 2019	Changed the doc to be the 8.4 Test Kit. Added notice that SOC can be added to the bulletin.
May 2019	Added instructions for setting up and testing a wireless adapter.
March 2019	Added sample setup steps to the Memory Persistence Test. Updated/rewrote the steps to format the USB storage device in the USB Test Setup section.
February 2019	Updated for SLES 15 SP1 and 8.3 test kit. Removed SLES 11 SP4 installation instructions.
January 2019	Made changes to the directions for the Memory Persistence Test and the Persistent Memory Test.
December 2018	Added information to the watchdog timer test section.
November 2018	Added "This test is optional." to the CPU Hot Plug test, Memory Hot Plug test, and Firmware BIOS test.
October 2018	Removed Firewire test and Firewire information from this document.
September 2018	Updated for SLES 12 SP4 and 8.2 test kit. Added additional information about the persistent memory test.
September 2018	Added manual SLES 11 SP4 instructions.
July 2018	First separated Public release of this document. This information is no longer contained in one large document.

