

ctys-uc-CentOS(7)

Setup CentOS

September 29, 2020

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1 General

The current document shows the basic installation of CentOS, which is basically a derivative of RedHat(TM) Linux variant.

The following host environment is used here:

- CentOS-5.4 with kvm-83 / Qemu-0.9.1
- Debian-5.0.6 with VirtualBox-3.2.10
- CentOS-5.4 with VMware-Player-2
- CentOS-5.4 with VMware-Player-3
- CentOS-5.5 with VMware-Server-2.0.2
- CentOS-5.4 with VMware-Workstation-6
- CentOS-5.4 with VMware-Workstation-7
- OpenSUSE-11.3 with Xen-3.x

The following client environment is used here:

- CentOS-5.5
- UnifiedSessionsManager - ctys-01.11.011

The following common assumptions and simplifications are chosen, when multiple approaches are valid.

1. The initial start of the machines are executed before scanning these into the inventory database. Thus the call is frequently executed by the suboption 'b:\$PWD', which defines the filesystem scan to be started at the given directory, in this case the current dir. This is particularly helpful in NFS based distributed environments with processing nodes containing identical directory structures.
2. The initial installation is proceeded by the vendor tools, when available. This avoids some deeper knowledge for the application of varios options.
3. The example setups are generally the provided defaults by the distributions. This should be also the first trial to become familiar with the environment.

2 Setup of Host-OS and Hypervisor

The installation for the following variants has to be performed by the appropriate standard setup of the HostOS, which quite straight forward:

- Debian with VirtualBox
- CentOS with QEMU/KVM
- CentOS with VMware-Server
- CentOS with VMware-Player
- CentOS with Xen

3 Setup of the UnifiedSessionsManager

3.1 Install tgz-Packages

1. Apply the standard installation procedure:

```
ctys-distribute -F 2 -P UserHomeCopy root@myHost
```

2. Open a Remote Shell by call of CLI plugin:

```
ctys -t cli -a create=1:myHost root@myHost
```

3. Check the plugins states by calling ctys-plugins:

```
ctys-plugins -T all -E
```

3.2 Install rpm-Packages

The following steps are required for a RPM based setup on CentOS. The installation is relocatable, but located at '/opt', and installed locally by 'ctys-distribute'.

1. Install BASE package.

```
rpm -i ctys-base-01.11.011.noarch.rpm
```

2. Now install a local version, here by copy. The PATH prefix is important here, particularly in case of updates. The path is resolved to it's actual path by eliminating any symbolic link, and used for consistent link of libraries.

```
/opt/ctys-01.11.011/bin/ctys-distribute -F 2 -P UserHomeCopy
```

3. Next the menu is setup.

```
ctys-xdg --menu-create
```

4. Now the help is available as either a Gnome or KDE menu. Alternatively could be called from the commandline.

3.3 Setup of the Gnome Menu

The setup of the Gnome Menu is quite simple, the contained tool **ctys-xdg** sets up a standard menu by the call:

```
ctys-xdg --menu-create
```

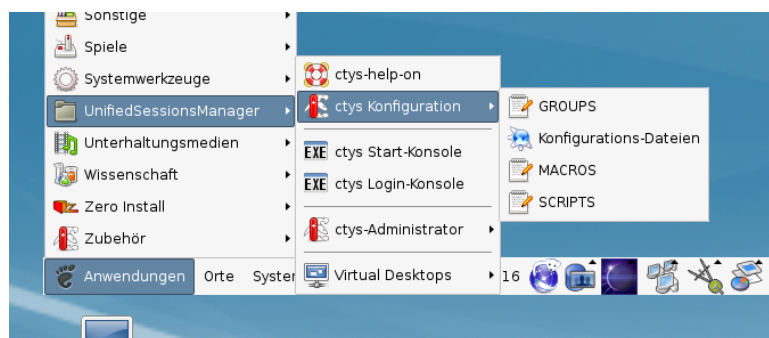


Figure 1: Default Menu

The call

```
ctys-xdg --menu-cancel
```

removes the installed files. For current version no checks for changed files is done.

The menus could be edited and extended by the call

```
ctys-xdg --menu-edit
```

which opens the related directories for modification of '*.menu', '*.desktop', and '*.directory' files.

4 Creation of the the Raw-VM

4.1 Creation of the Raw-VM with QEMU/KVM

The demo example VM is here named tst219, this is the hostname of GuestOS too.

1. Login into the machine where VirtualBox is installed.

```
ssh -X app2
```

When just the processing node of mounted filesystem has to be changed, the following call could be applied. This works in case of identical mount paths:

```
ctys -t cli -a create=1:tst220,cd:$PWD root@lab02
```

2. Change to the vmpool and create a directory and change into.

```
mkdir tst219
```

3. Call the install and configuration utility for VMs. Here some values are set by environment variables, a complete list including the actually assigned values could be displayed by the option **-levo**.

```
ARCH=x86_64 \  
DIST=CentOS \  
DISTREL=5.5 \  
OS=Linux \  
OSREL=2.6 \  
ctys-createConfVM -t qemu --label=tst219
```

This call creates a virtual image(hda.img), the call-wrapper(tst219.sh), and the configuration file(tst219.ctys). The files are created from templates by assigning configuration values either from pre-configured default values, or interactive variation. The whole process of creation could be batch-proceeded by using the either the **-auto**, or the **-auto-all** option when appropriate default values are preconfigured.

When no MAC database nor DHCP is available, the MAC and IP addresses might be provided too.

4. Once the set of files is created the virtual machine is prepared for startup. For some other systems complete installation routines are available, e.g. debian and CentOS. The current state could be checked now by the following call.

```
./tst219.sh --console=vnc --vncaccessdisplay=47 --print --instmode --check
```

5. The installation could be started now e.g. on the install host by:

```
./tst219.sh --console=vnc --vncaccessdisplay=47 --print --instmode
```

Alternatively a remote call could be proceeded:

```
ctys -t qemu -a create=1:tst219,b:${VMPATH},instmode app2
```

In case of appropriate defaults(refer to tst220.ctys) this starts e.g. the CD/DVD installation.

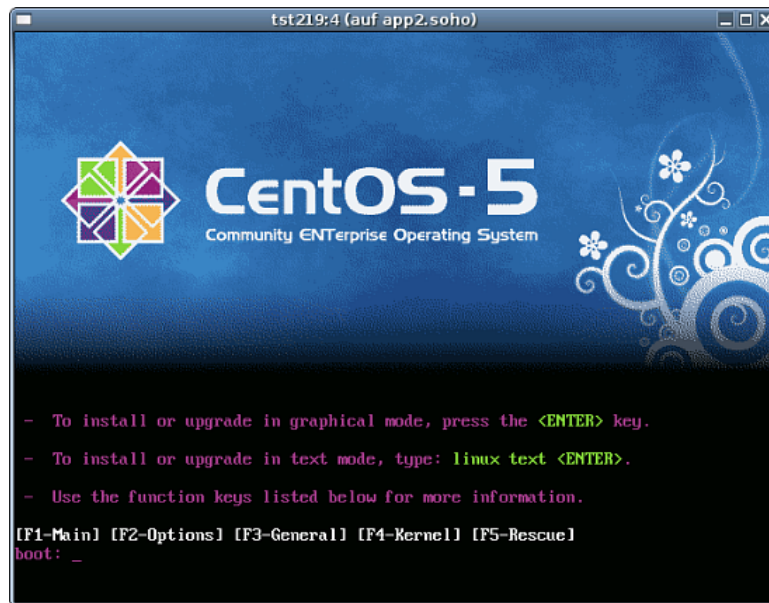


Figure 2: Start CentOS installation - CD/DVD

The following call with PXE is utilized here:

```
ctys \  
-t qemu \  
-a create=1:tst219,b:${VMPATH},instmode:PXE%default%HDD%default%init \  
app2
```

Resulting to:

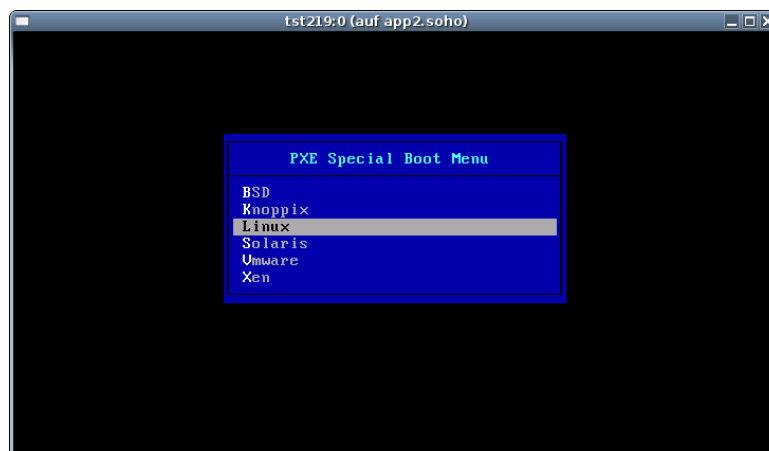


Figure 3: Start CentOS installation - PXE

6. Once the appropriate install kernel is chosen, the following procedure is the common install procedure as described later.

4.2 Creation of the Raw-VM with VirtualBox

The creation of the raw VM is first step to be executed at the host operating system. This could be either performed locally or remote and requires the usage of the provided tools by VirtualBox(TM).

1. Login into the machine where VirtualBox is installed.

```
ssh -X lab02
```

2. Execute the VirtualBox(TM) console.

```
VirtualBox
```

3. Create the VM, the machine is called here 'tst220'. When finished the raw VM is present and could be used as required, for basic functions of ctys no additional configuration is required.

- (a) The OS is 'Linux', the version is 'Linux 2.6'.
- (b) Set RAM to 512MByte.
- (c) Create a virtual HDD, here 8GByte is chosen.

4. When additional information is required to be stored coallocated to the VM and scanned automatically into a database, than the tool **ctys-createConfVM** should be applied. This generates additional detailed information related to the specific VM and the inherent guest OS. The call could be executed either interactive or automatic.

Call within the same directory for first inspection:

```
ctys-createConfVM -t vbox --label=tst137 --levo
```

This lists some defaults for the specific hypervisor. These could be preconfigured by specific template files within the configuration directory **ctys-createConfVM.d**.

The following call actually generates the appropriate configuration

```
DIST=CentOS \
DISTREL=5.5 \
OS=Linux \
OSREL=2.6 \
MAC=00:50:56:13:12:14 \
IP=172.20.2.20 \
ARCH=x86_64 \
ctys-createConfVM --label=tst220 -t vbox
```

The result displayed with **-levo** is:

Not all values require to be set, some will be requested later by dialogue.

Thus it is not necessary to have values assigned to the complete displayed set.

Actually used sources for default values:

- no-marker = Pre-Set value, either from defaults configuration, or by commandline.
- no-value = Either requested by dialog later, or the defaults of the finally called

- application are used.
- (c) = Read from actual configuration file, e.g. vmx-file.
 - (d) = Read from database.
 - (g) = Dynamically generated.
 - (h) = Used from current host as default.
 - (m) = Received from mapping definitions.

Applicable modifications:

- blue = By call option, defines dependency for others.
- green = By environment, 'could be set almost independent' from other values.
- cyan = By miscellaneous facilities, but is dependent from others.
E.g. LABEL defines by convention the network 'hostname', thus the TCP/IP params.
This could ..., but should not be altered!

Most of the missing values will be fetched during actual execution of this tool by dynamic evaluation.

VAR name:Initial Value

```

C_SESSIONTYPE:VBOX
  LABEL:tst220
  MAC:00:50:56:13:12:14 (c)
  IP:172.20.2.20 (m)
  BRIDGE:
  DHCP:
  NETMASK:
  TCP:
  GATEWAY:

EDITOR:acue

  UUID:e982e0c4-2de8-40f1-aa6e-8c615096b37c (c)

  DIST:debian (h)
  DISTREL:5.5
  OS:Linux
  OSREL:2.6

  ARCH:x86_64
  ACCELERATOR:HVM (c)
  SMP:1 (c)
  MEMSIZE:768 (c)
  KBD_LAYOUT:de

STARTERCALL:/usr/bin/VirtualBox

DEFAULTBOOTMODE:HDD

DEFAULTINSTTARGET:/mnt/vmool/vmool05/vbox/test/...
  ...tst-ctys/tst220/tst220.vdi
HDDBOOTIMAGE_INST_SIZE:8192M

VMSTATE:ACTIVE

```


Remember that this is a draft pre-display of current defaults. No consistency-checks for provided values are performed at this stage. Some missing values are evaluated at a later stage dynamically.

When the call is finished the file 'tst137.ctys' with additional configuration information is stored.

- 5. Add the install image as a bootable CD/DVD and set this as the boot device for the VM or use PXE. The procedures are identical after the boot of the kernel. This example uses PXE.

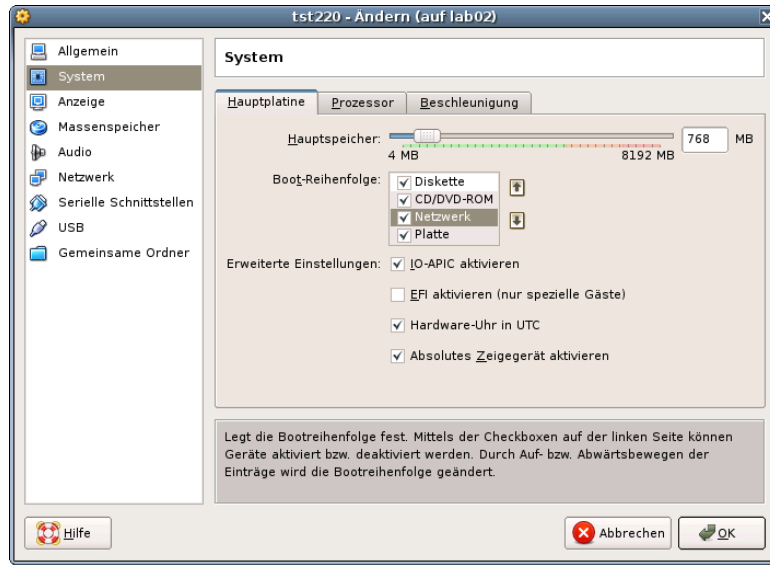


Figure 4: Set PXE

Use network install of CentOS-5.5.

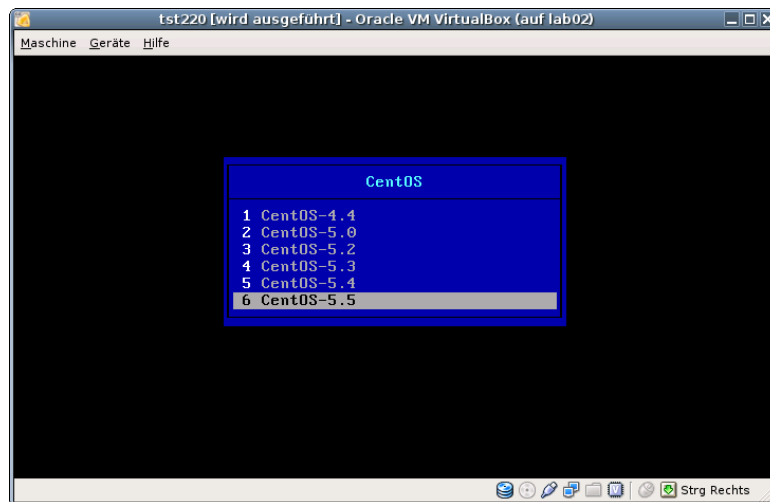


Figure 5: Set PXE

6. The start of actual CentOS-5.5 install procedure, from now on all post-bootstrap procedured are equal. Here the start from the VirtualBox console is choosen.

4.3 Creation of the Raw-VM with VMware-Server-1

ffs.

4.4 Creation of the Raw-VM with VMware-Server-2

The installation of raw machine is performed here by the native vendor supported tools. These could be started e.g. by using the X11 plugin and execution of a remote command. The advance is the transparent encryption on the inter-node connections by SSH. This e.g. in case of problems with the https port the unencrypted http GUI could still be used in a secure manner for network connections. All connections are tunneled by OpenSSH, here the X-displayforwarding with the '-X' option. The start of the VMW console for RHEL-5.5 and VMware Server-2.0.2 is:

```
ctys -t x11 -a create=1:vmwcon,cmd:vmware root@lab05
```

This starts the default fornt end, here the Firefox browser.

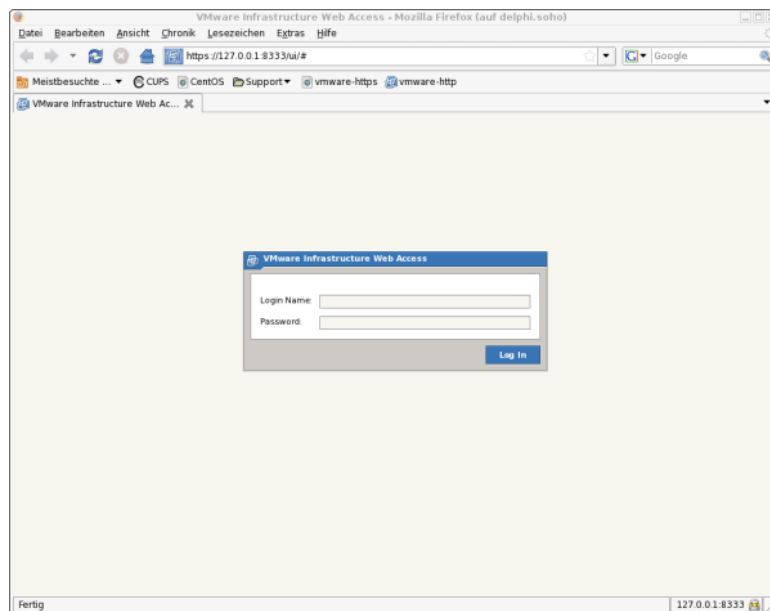


Figure 6: Start VMware Server Console

REMARK:

The current version of the **UnifiedSessionsManager** requires by convention the coallocation of the VMX file and the boot HDD. Particularly the enumeration of VMs requires the presence of the VMX file. In some cases - for Server-2 when the allocation is altered from the defined storage - these are stored by default into different directories. This has to be considered for the allocation of new VMs.

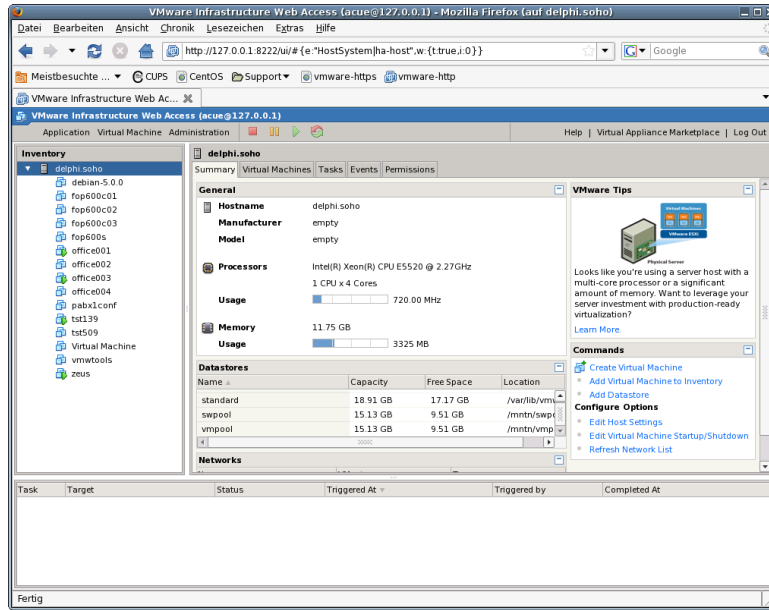


Figure 7: VMware Server Console

The virtual machine should be selected as hardware version 4 when maximum compatibility is required.

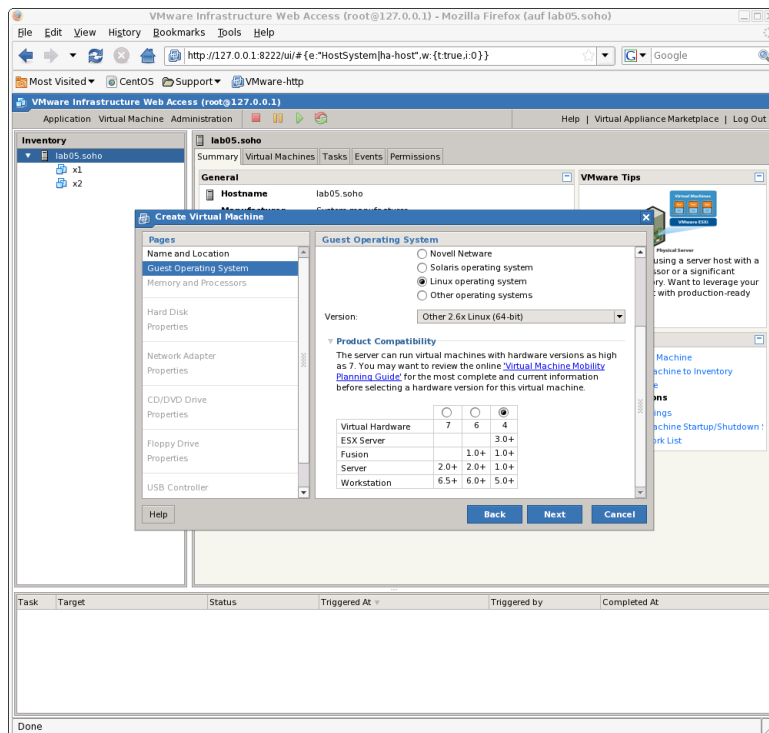


Figure 8: VMware Compatibility

For tight and vendor independent management of the VMs and PMs the MAC addresses should be assigned individually to each machine and centrally managed by DHCP.

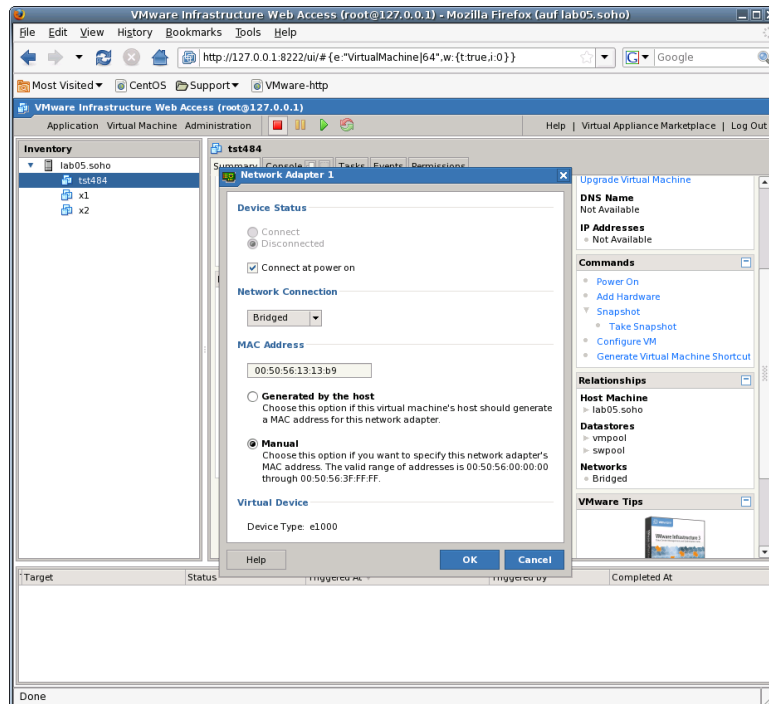


Figure 9: VMware set MAC address

In addition the UUID of the VM should be set to fixed by manual edition of the VMX file. This has advantages for unambiguity in networked operating environments. The UUID is part of the `<machine-address>` and therefore stored within the database and could be used for persistent addressing. Thus should not be changed by a harmless move, due to an algorithm for assurance of generic unambiguity.

Once the setup is finished by means of the vendor tools, the following steps of installation could be proceeded either continued solely by the vendor provided environment, or by application of the UnifiedSessionsManager toolset. The `instmode` for adaption of the actual boot configuration is not yet supported, thus a normal startup by management of boot and installmedia by the vendor products has to be applied.

The following operational procedures within the GuestOS are similar for all hypervisors. Just a few exceptions exist for installing specific driver sets - so called Tools available e.g. for almost all VMware(TM) products. These have to be mounted as install media and installed by the provided installer.

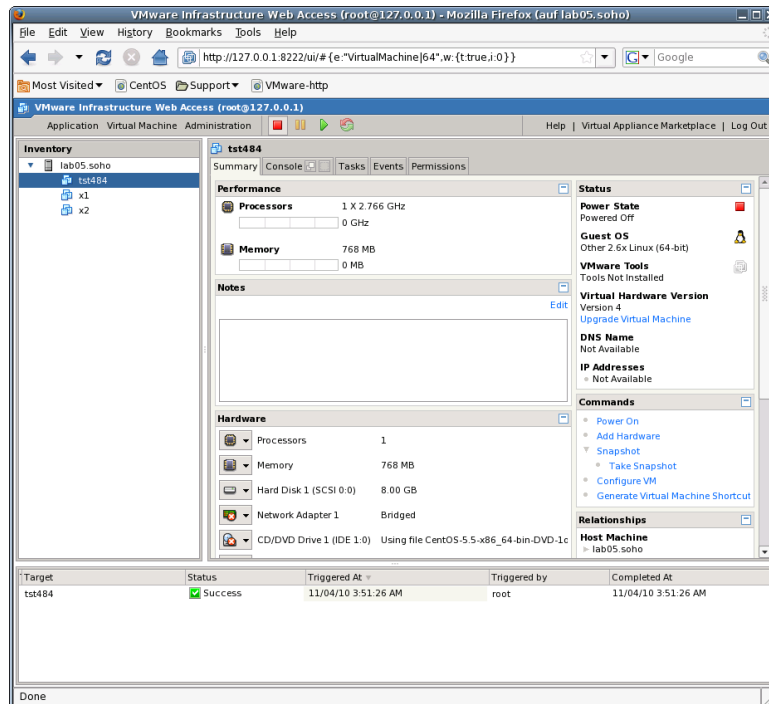


Figure 10: VMware Prepared VM

The following demonstrates the reallocation of the machine files to a common directory with the storage devices. The virtual HDD is stored within the directory

```
[Datastore] vmpool05/vmw/test/tst-ctys/tst484/tst484.vmdk
```

whereas the VM configuration files are stored by the system in the datastore to

```
[Datastore] tst484/...
```

1. Remove the VM tst488 without deletion.

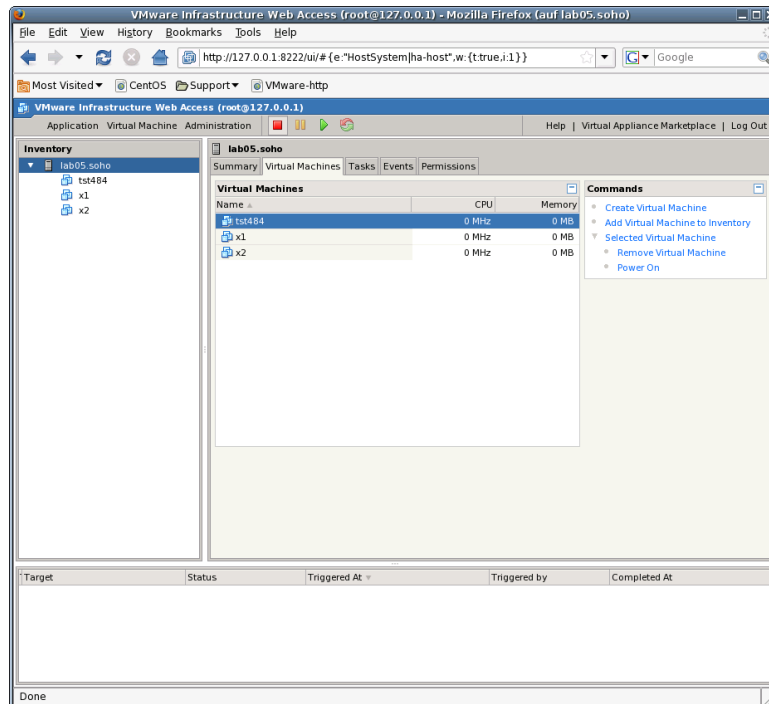


Figure 11: Remove VM

2. Move the directory and concat all files within the same. Then check the filenames of storage devices within the VMX file, which are absolute filenamepaths anyway. Here:

```
scsi0:0.fileName = "/mntn/vmpro ..."
ide1:0.fileName = "/mntn/swpool/UNIXDist..."
```

3. Make the UUID static by:

```
uuid.action = "keep"
```

4. Make the MAC address static by:

- Delete:

```
ethernet0.addressType = "generated"
ethernet0.generatedAddress = "00:0c:29:9c:6a:6a"
```

- Add:

```
ethernet0.addressType = "static"
ethernet0.address = "00:50:56:13:11:33"
```

5. Adapt - if required -

```
displayName = "tst484"
```

which is the so called **LABEL**.

For the management of the GuestOSs and integration into the database of the UnifiedSessionsManager the inventory functions by `ctys-createConfVM` and `ctys-vdbgen` should be at least post-applied once after finishing the guest installation.

The installed GuestOS is here the same as the HostOS, with the only difference, that the architecture has to be set to 'ARCH=i386'. This reduces the call for configuration creation to:

```
ARCH=i386 ctys-createConfVM -t vmw --label=tst484
```

The `-levo` display is:

Not all values require to be set, some will be requested later by dialogue.
Thus it is not necessary to have values assigned to the complete displayed set.

Actually used sources for default values:

```
no-marker = Pre-Set value, either from defaults configuration,
           or by commandline.
no-value  = Either requested by dialog later, or the defaults
           of the finally called
           application are used.
(c)       = Read from actual configuration file, e.g. vmx-file.
(d)       = Read from database.
(g)       = Dynamically generated.
(h)       = Used from current host as default.
(m)       = Received from mapping definitions.
```

Applicable modifications:

```
blue      = By call option, defines dependency for others.
green     = By environment, 'could be set almost independent'
           from other values.
cyan      = By miscellaneous facilities, but is dependent from others.
           E.g. LABEL defines by convention the network 'hostname',
           thus the TCP/IP params.
           This could ..., but should not be altered!
```

Most of the missing values will be fetched during actual execution of
this tool by dynamic evaluation.

```
VAR name:Initial Value
```

```
  LABEL:tst484
```

```
    MAC:00:50:56:13:13:B9 (c)
```

```
    IP:172.20.6.184 (m)
```

```
  BRIDGE:
```

```
    DHCP:
```

```
  NETMASK:
```

```
    TCP:tst484 (m)
```

```
  GATEWAY:
```

```
  EDITOR:acue
```

```
  UUID:564d99fb5a6c2897edce5b14279c6a6a (c)
```

```
  DIST:CentOS (h)
```

```
  DISTREL:5.5 (h)
```

```
    OS:Linux (h)
```

```
    OSREL:2.6.18-194.el5 (h)
```

```
  ARCH:x86_64 (h)
```

```
  ACCELERATOR:
```

```
    SMP:
```

```
  MEMSIZE:768 (c)
```

```
  KBD_LAYOUT:de
```

```
STARTERCALL:/usr/bin/vmware
```

```
VMSTATE:ACTIVE
```

Remember that this is a draft pre-display of current defaults.
 No consistency-checks for provided values are performed at this stage.
 Some missing values are evaluated at a later stage dynamically.

The result could be inspected e.g. by the following call with one of the standard macros. Called within the directory of the VM, therefore starting at the scan-base 'b:\$PWD'.

```
ctys -t vmw "{MACRO:enumdefault},b:$PWD"
```

Resulting in the output:

label	stype	accel	distro	distrorel	os	osrel	PM	if	TCP
tst484	VMW		CentOS	5.5	Linux	2.6.18-194	lab05.soho	0	172.20.6.184

4.5 Creation of the Raw-VM with VMware-Player

ffs.

4.6 Creation of the Raw-VM with VMware-Workstation

ffs.

4.7 Creation of the Raw-VM with VMware-ESXi

ffs.

4.8 Creation of the Raw-VM with VMware-ESX

ffs.

4.9 Creation of the Raw-VM with Xen

The examples for installation of Xen GuestOSs are performed here on a RedHat-Enterprise-Linux - RHEL-5.5 server. The procedures are almost identical to other derived distributions, e.g. CentOS, ScientificLinux, or EnterpriseLinux.

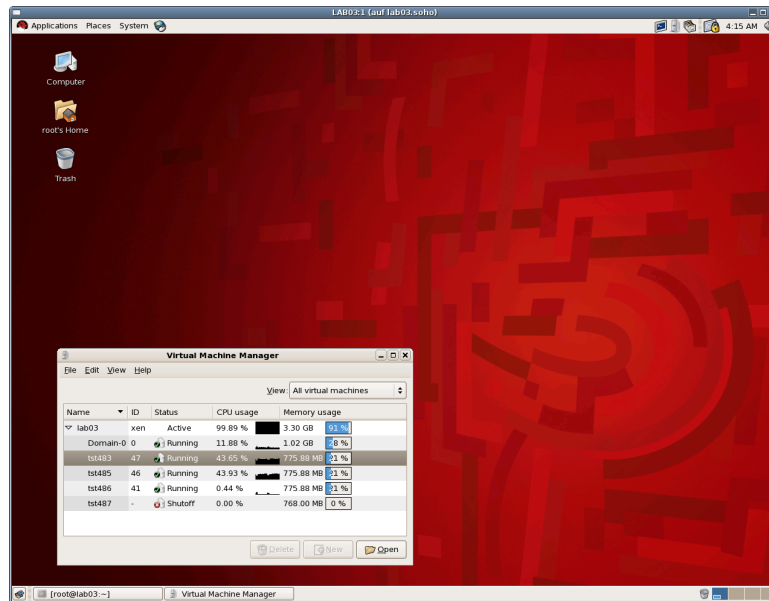


Figure 12: Remove VM

The Xen files, including the Python conf-file and the initial virtual devices are created by the utility **ctys-createConfVM**. Thus e.g. the MAC address has to be provided when networking is required. In some cases - e.g. for OpenSUSE or debian - it might be required to provide the virtual bridge too. This is due to internal detection a so called Xen-Bridge by searching for the first bridge containing a 'pethX' device, which sometimes varies. E.g. for debian the bridge is called in some releases simply 'eth0'. Thus when errors with networking due to missing bridge occurs, than just set an appropriate default. If this still does not suffice, than the variable 'FORCE_THIS_IS_XEN_BRIDGE=br0' may help. But be aware, when the machine is executed on different machines with various HostOSs, e.g. viy NFS. Than the bridge names may vary, and may require to be adapted. This is the reason of dynamic evaluation for the networking devices.

Now execute the call for the complete creation of the VM.

```
MAC=00:50:56:13:13:B7 \
DIST=CentOS \
DISTREL=5.5 \
OS=Linux \
OSREL=2.6.18 \
ctys-createConfVM -t XEN --label=tst482
```

This creates with the `-levo` check the output:

Not all values require to be set, some will be requested later by dialogue. Thus it is not necessary to have values assigned to the complete displayed set.

Actually used sources for default values:

- no-marker = Pre-Set value, either from defaults configuration, or by commandline.
- no-value = Either requested by dialog later, or the defaults of the finally called application are used.
- (c) = Read from actual configuration file, e.g. vmx-file.
- (d) = Read from database.

- (g) = Dynamically generated.
- (h) = Used from current host as default.
- (m) = Received from mapping definitions.

Applicable modifications:

- blue = By call option, defines dependency for others.
- green = By environment, 'could be set almost independent' from other values.
- cyan = By miscellaneous facilities, but is dependent from others. E.g. LABEL defines by convention the network 'hostname', thus the TCP/IP params. This could ..., but should not be altered!

Most of the missing values will be fetched during actual execution of this tool by dynamic evaluation.

```

VAR name:Initial Value
C_SESSIONTYPE:XEN
  LABEL:tst482
  MAC:00:50:56:13:13:B7
  IP:172.20.6.182 (m)
  BRIDGE:
  DHCP:
  NETMASK:
  TCP:tst482 (m)
  GATEWAY:

  EDITOR:acue

  UUID:e589efe5-5fe5-4de8-890c-43484b5a64e4 (h)

  DIST:CentOS
  DISTREL:5.5
  OS:Linux
  OSREL:2.6.18
  ARCH:x86_64 (h)
  ACCELERATOR:HVM (h)
  SMP:1
  MEMSIZE:768
  KBD_LAYOUT:de

  STARTERCALL:/usr/sbin/xm
  WRAPPERCALL:/usr/bin/sudo.sh

```

```
DEFAULTBOOTMODE:HDD
```

```

DEFAULTINSTTARGET:/mntn/vmpool/vmool05/xen/test/tst-ctys/tst482/xvda.img
HDDBOOTIMAGE_INST_SIZE:8G
HDDBOOTIMAGE_INST_BLOCKSIZE:256M
DDBOOTIMAGE_INST_BLOCKCOUNT:32
HDDBOOTIMAGE_INST_BALLOON:y

```

```

DEFAULTINSTMODE:CD
INSTSRCCDROM:/mntn/swpool/UNIXDist/centOS/5.5/inst/isos/...
...x86_64/CentOS-5.5-x86_64-bin-DVD-1of2.iso
DEFAULTINSTSOURCE:/mntn/swpool/UNIXDist/centOS/5.5/inst/isos/...
...x86_64/CentOS-5.5-x86_64-bin-DVD-1of2.iso

```

```
BOOTLOADER:/usr/lib/xen/boot/hvmloder
INST_KERNEL:/usr/lib/xen/boot/hvmloder
```

```
VMSTATE:ACTIVE
```

Remember that this is a draft pre-display of current defaults.
No consistency-checks for provided values are performed at this stage.
Some missing values are evaluated at a later stage dynamically.

The following call starts the initial installation of the VM:

```
ctys -t xen -a create=1:tst482,reuse,b:$PWD,instmode root@lab03
```

4.10 Creation of the Raw-VM with XenServer

ffs.

5 Installation of the GuestOS - CentOS

1. Install CentOS-5.5. The following steps are almost identical to all hypervisors. The few exceptions are depicted when required, e.g. change of the QEMU/KVM reboot mode after installation.
2. From now on for the tests the default settings are used, just the network interfaces are changed to DHCP.



Figure 13: Start CentOS installation - Anaconda



Figure 14: Proceed CentOS installation

Once the installation is completed for QEMU/KVM the boot mode has to be changed. This could be either processed completely within the so called monitor, or just by rebooting without the 'instmode' suboption. Therefore either change into the monitor mode by typing **Ctrl-Alt-2** and the **quit** command, or by the CANCEL call, The close of the default VNC console only will not stop the server:

```
ctys -t qemu -a cancel=1:tst219,b:${VMDIRECTORYPATH},poweroff app2
```

The syntax for this is similar for all supported hypervisors.

The following call starts the VM into standard operations.

```
ctys -t qemu -a create=1:tst219,b:${VMDIRECTORYPATH} app2
```



Figure 15: Proceed CentOS installation

The machine now starts into the firstboot mode, where some basic system settings has to beset.



Figure 16: CentOS firstboot

Once the basic post-install configuration is finished the machine reboots into the normal operations mode.

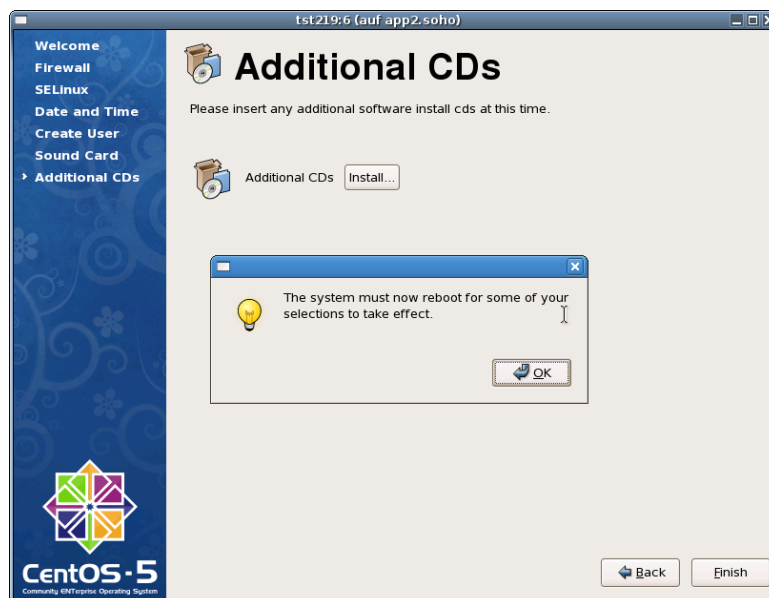


Figure 17: Finish post-install

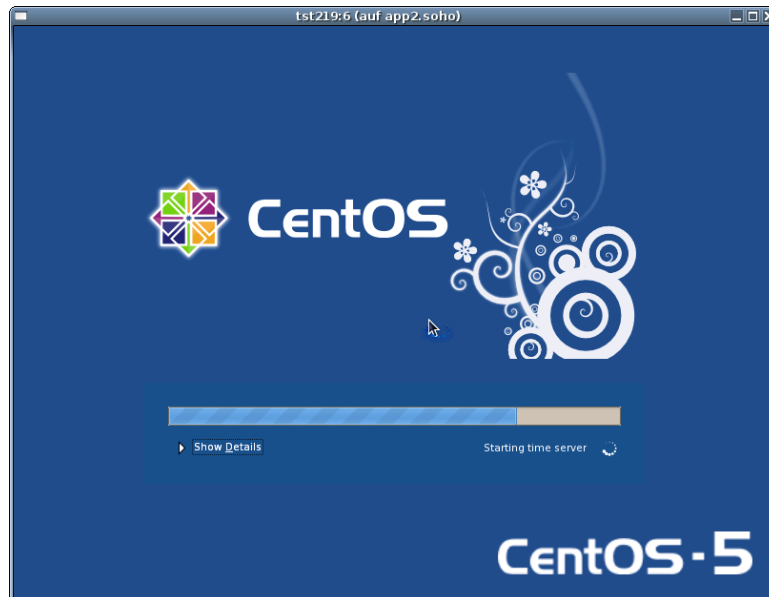


Figure 18: Proceed CentOS operational boot

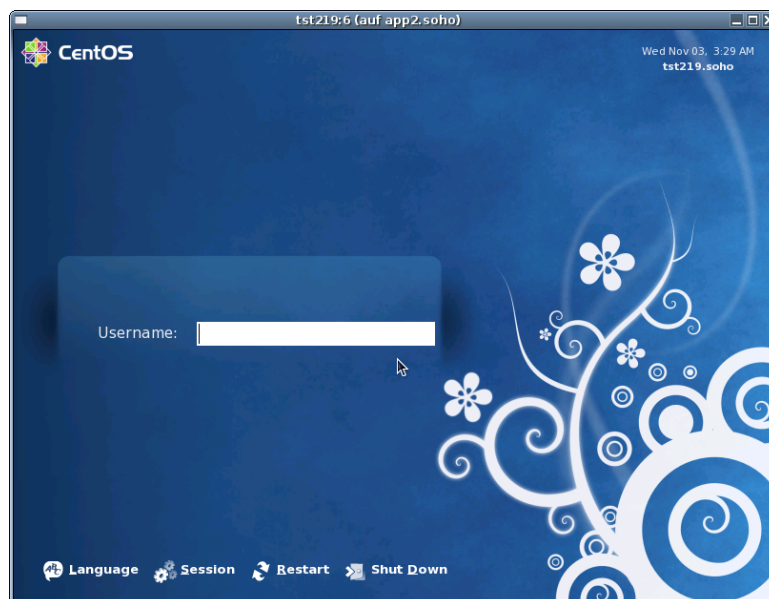


Figure 19: Final Login

6 Creation of the Inventory - cachedB

In case of a common mounted NFS filesystem for the pool VMs for simplicity just change into the directory of the VM on any machine. Call for the first check **ctys-vdbgen** with the **-stdio** option for display only.

```
ctys-vdbgen --append --base=$PWD --stdio -- lab02
```

When the result is displayed correctly just call

```
ctys-vdbgen --append --base=$PWD -- lab02
```

The following output should be displayed:

Prepare execution-call:

```
Require DB-PATH,          USE: DEFAULT_DBPATHLIST="/homen/acue/.ctys/db/default"
Require DB-PATH,          USE: -o => "/homen/acue/.ctys/db/default"
APPEND mode                : ON(1)
STDIO mode off             : OFF(0)
Set TYPE scope            ADD: DEFAULT="-t ALL"
Preload TYPE set          ADD: DEFAULT="-T ALL"
For splitted operations    ADD: DEFAULT="-b sync,seq "
Nameservice cache         OFF: DEFAULT="-c off "
Data cache                 OFF: DEFAULT="-C off "
```

```
Resulting ENUMERATE      ADD: DEFAULT="-a enumerate=...
...matchvstat:active%disabled%empty,machine,\
b:/mntn/vmpool/vmpool05/vbox/test/tst-ctys/tst137 \
-C off -c off -T ALL "
```

```
-> generate DB(may take a while)...
```

```
-----
START:08:38:35
-----
```

```
-----
END:08:39:03
DURATION:00:00:28
-----
```

```
RET=0
-----
```

Cached data:

```
Mode:                APPEND
Pre-Appended:        834 records
Appended:             1 records
Fetched Records Raw:  records
Fetched Records Unique:  records
Final:               835 records
```

```
-----
...finished.
```

This shows that only one entry is appended to the existing database with 834 VM-Entries. Now check the database entry by calling:

```
ctys-vhost tst137
```

The following result should be displayed:

```
label |stype|accel|distro|distrorel|os   |osrel|PM   |if |TCP
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
tst137|VBOX |      |CentOS|1.0.0   |Linux|2.6   |lab02|0   |172.20.2.241
```

7 Graphical Start of the Virtual Machine

Now call the menu item for start of the VM 'tst137'.

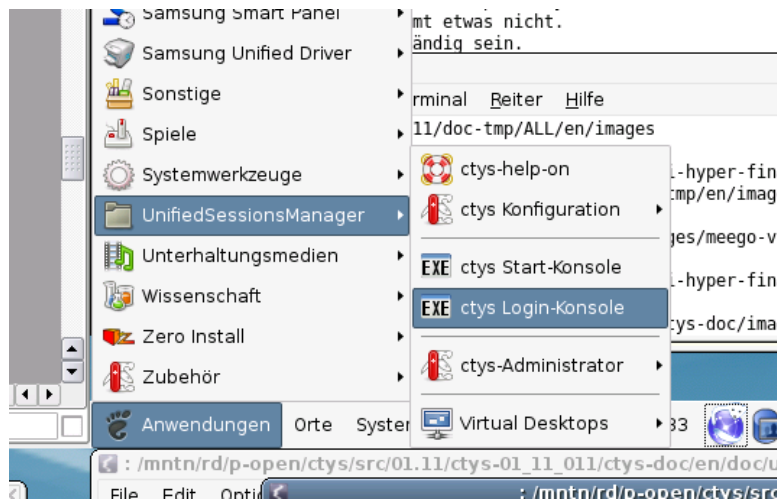


Figure 20: CentOS Start Menu

The created cacheDB record for the VM 'tst137' is now automatically visible in the list of startable virtual machines.

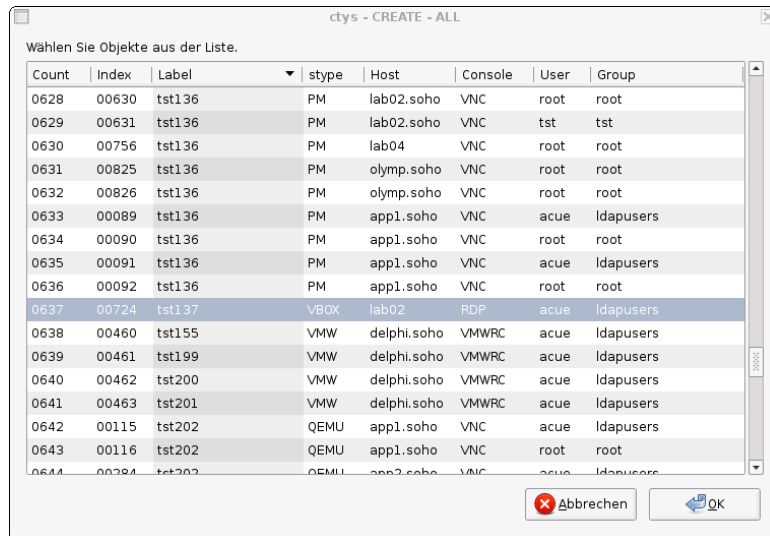


Figure 21: CentOS VM Selection

Confirm the selected entry.

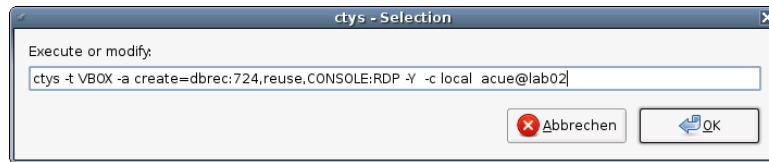


Figure 22: CentOS Call Confirmation

8 Manage the VM

8.1 Common Syntax

8.2 Prepare CentOS

1. Set yum repository in '/etc/yum.repo.d/'
2. Install the following additional Packages:
 - (a) openssh-server
 - (b) make
 - (c) gcc
 - (d) kernel-devel
 - (e) kernel-netbook-devel

Almost absolutely required is a Single-Sign-On facility for OpenSSH. This is due to the required multiple remote remote calls for a number of operational modes. Recommended is either the usage of SSH-Keys, or Kerberos by GSSAPI.

8.3 Install UnifiedSessionsManager in GuestOS - CentOS

Apply standard procedure:

```
ctys-distribute -F 2 -P UserHomeCopy root@tst137
```

8.4 Open a Remote CLI-Terminal

Call CLI plugin:

```
ctys -t cli -a create=1:tst137 root@tst137
```

8.5 Check Plugins States

Call ctys-plugins:

```
ctys-plugins -T all -E
```

8.6 Open a Remote RDP-Desktop

ffs.

8.7 Open a Remote VNC-Desktop

Call VNC plugin:

```
ctys -t vnc -a create=1:tst137,reuse root@tst137
```

8.8 Open a Remote X11-Terminal

Call VNC plugin:

```
ctys -t x11 -a create=1:tst137,reuse root@tst137
```

9 SEE ALSO

ctys-configuration-QEMU(7) , *ctys-configuration-VBOX(7)* , *ctys-createConfVM(1)* , *ctys-plugins(1)* , *ctys-QEMU(1)* , *ctys-uc-QEMU(7)* , *ctys-uc-VBOX(7)* , *ctys-vhost(1)* , *ctys-uc-VMW(7)* , *ctys-VBOX(1)* , *ctys-VMW(1)* , *vmware(1)*

For System Tools:

CentOS: [<http://www.centos.org>]

RedHat(TM): [<http://www.redhat.com>]

10 AUTHOR

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<<https://github.com/unifiedsessionsmanager>>



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