Servidor de terminales LTSP en Centos

Por: John A. Pérez B. ~ 20186748

Este tutorial es un extracto del siguiente video:

https://youtu.be/ZjII2PJzpYM

Para seguir este tutorial es necesario haber configurado el servicio DHCP en el servidor

Configuración del servidor

Primero instalamos los paquetes **xinetd**, **syslinux**, y **tftp-server**

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual ...nding toolbar buttons. You can popup a tools of currently selected element using corresp...

You can press the **F1** key to get instant help, or visit www.virtualbox.org fo...

centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
[root@ltsp-20186748 ~]# yum install -y xinetd syslinux tftp-server
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
```

Right Ctrl

6:48 PM

Luego copiamos el archivo **pxelinux.0** localizado en el directorio **/usr/share/syslinux** dentro del directorio **/var/lib/tftpboot**

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

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centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
[root@ltsp-20186748 ~]# cp /usr/share/syslinux/pxe
pxechain.com  pxelinux.0
[root@ltsp-20186748 ~]# cp /usr/share/syslinux/pxe
pxechain.com  pxelinux.0
[root@ltsp-20186748 ~]# cp /usr/share/syslinux/pxelinux.0 /var/lib/tftpboot/_
```

Right Ctrl

6:49 PM

Luego habilitamos el servicio tftp cambiando a **no** la opción **disable** del archivo de configuración localizado en el directorio **/etc/xinetd.d/tftp**

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

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centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
[root@ltsp-20186748 ~]# vim /etc/xinetd.d/tftp
```

Right Ctrl

6:49 PM

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

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centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
# default: off
# description: The tftp server serves files using the trivial file transfer \
#       protocol.  The tftp protocol is often used to boot diskless \
#       workstations, download configuration files to network-aware printers, \
#       and to start the installation process for some operating systems.
service tftp
{
        socket_type             = dgram
        protocol                = udp
        wait                    = yes
        user                    = root
        server                  = /usr/sbin/in.tftpd
        server_args             = -s /var/lib/tftpboot
        disable                 = no
        per_source              = 11
        cps                     = 100 2
        flags                   = IPv4
}
~
-- INSERT --                                                    14,16-37      All
```

Right Ctrl

6:49 PM

En el archivo de configuración de dhcp **dhcpd.conf** localizado en el directorio **/etc/dhcpd,** dentro de las configuraciones de nuestra subred agregamos las opciones **filename “pxelinux.0”**, y **next-server** donde colocamos la dirección de nuestro servidor. Luego reiniciamos el servicio dhcp

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

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centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
[root@ltsp-20186748 ~]# vim /etc/dhcp/dhcpd.conf
```

Right Ctrl

6:50 PM

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual ... nding toolbar buttons. You can popup a tools of currently selected element using corresp...

You can press the **F1** key to get instant help, or visit www.virtualbox.org fo...

centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
#   see /usr/share/doc/dhcp*/dhcpd.conf.example
#   see dhcpd.conf(5) man page
#
authoritative;
DHCPDARGS="enp0s10";
default-lease-time 600;
max-lease-time 7200;

subnet 10.0.0.0 netmask 255.255.255.0 {
        option subnet-mask 255.255.255.0;
        option routers 10.0.0.1;
        filename "pxelinux.0";
        next-server 10.0.0.2;
        option domain-name-servers 192.168.1.1;
        range 10.0.0.10 10.0.0.20;
}

"/etc/dhcp/dhcpd.conf" 18L, 418C written
[root@ltsp-20186748 ~]# systemctl restart dhcpd
[root@ltsp-20186748 ~]# _
```

Right Ctrl

6:50 PM

Ahora procedemos a instalar otros dos paquetes **dracut-network**, y el **nfs-utils**

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File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

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You can press the **F1** key to get instant help, or visit www.virtualbox.org fo...

centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
[root@ltsp-20186748 ~]# yum -y install dracut-network nfs-utils
Loaded plugins: fastestmirror, langpacks
```

Right Ctrl

6:51 PM

Luego dentro del directorio **/var/lib/tftpboot** creamos los directorios **/centos7/root**

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

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You can press the **F1** key to get instant help, or visit www.virtualbox.org fo...

centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
[root@ltsp-20186748 ~]# mkdir -p /var/lib/tftpboot/centos7/root
[root@ltsp-20186748 ~]#
```

Right Ctrl

6:52 PM

Dentro del directorio root que acabamos de crear descargamos los paquetes de la interfaz gráfica. Para esto utilizamos **yum groupinstall** y descargamos el grupo de paquetes llamado **“Server with GUI”** **--releasever=7** con la opción **--installroot=[directorio]**

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

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buttons. You can popup a tools of currently selected element using corresp

You can press the **F1** key to get instant help, or visit www.virtualbox.org fo

centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
[root@ltsp-20186748 ~]# yum group install -y "Server with GUI" --releasever=7 --installroot=/var/lib
/tftpboot/centos7/root/
Loaded plugins: fastestmirror, langpacks
There is no installed groups file.
Maybe run: yum groups mark convert (see man yum)
Determining fastest mirrors
 * base: centos.brisanet.com.br
 * extras: centos.brisanet.com.br
 * updates: mirror.edatel.net.co
base                                                     | 3.6 kB  00:00:00
extras                                                   | 2.9 kB  00:00:00
updates                                                  | 2.9 kB  00:00:00
(1/4): base/7/x86_64/group_gz                            | 165 kB  00:00:01
(2/4): extras/7/x86_64/primary_db                        | 153 kB  00:00:01
(3/4): base/7/x86_64/primary_db     12% [===                    ] 785 kB/s | 1.3 MB  00:00:12 ETA
```

Right Ctrl

6:56 PM

Generamos las credenciales del usuario de nuestro cliente utilizando el script de python:

**python -c 'import crypt,getpass; **

**print(crypt.crypt(getpass.getpass(), **

crypt.mksalt(crypt.METHOD_SHA512)))'

Luego colocamos la contraseña del usuario

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual ...nding toolbar buttons. You can popup a tools of currently selected element using corresp...

You can press the **F1** key to get instant help, or visit www.virtualbox.org fo...

centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
[root@ltsp-20186748 ~]# python -c 'import crypt,getpass;\
print(crypt.crypt(getpass.getpass(),\
crypt.mksalt(crypt.METHOD_SHA512)))'
Password:
$6$UTnMDPv17VQStfHN$1PrvCo8dk251/u8H2CO25x1hYOmJVTpAQfPBdyHRPm70P1Ni04YU1AMDeN8W91xyT2k0BTAkadQEO8Wp
C9mXb/
[root@ltsp-20186748 ~]#
```

Right Ctrl

7:30 PM

Dentro del archivo **/var/lib/tftpboot/centos7/root/etc/fstab**, montamos los directorios principales de nuestros clientes

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual ... nding toolbar buttons. You can popup a tools of currently selected element using corresp...

You can press the **F1** key to get instant help, or visit www.virtualbox.org fo...

centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
none    /tmp        tmpfs   defaults   0   0
tmpfs   /dev/shm    tmpfs   defaults   0   0
sysfs   /sys        sysfs   defaults   0   0
proc    /proc       proc    defaults   0   0_
~
-- INSERT --                                   4,30-58   All
```

Right Ctrl

7:36 PM

Ahora descargamos los archivos **vmlinuz** y **initrd.img** de la imagen del sistema operativo que utilizaremos para nuestros clientes, dentro del directorio **/var/lib/tftpboot/centos7**

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual
buttons. You can popup a tools of currently selected element using corresp

You can press the **F1** key to get instant help, or visit www.virtualbox.org fo

centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
[root@ltsp-20186748 etc]# wget -p /var/lib/tftpboot/centos7/ http://mirror.centos.org/centos/7/os/x8
6_64/images/pxeboot/vmlinuz http://mirror.centos.org/centos/7/os/x86_64/images/pxeboot/initrd.img
```

Right Ctrl

8:02 PM

En el archivo **/var/lib/tftpboot/pxelinux.cfg/default** colocamos

---

label centos7

kernel centos7/vmlinuz

append initrd=centos7/initrd.img root=nfs:10.0.0.2:/var/lib/tftpboot/centos7/root rw selinux=0

---

donde asignamos la dirección del kernel y el inicializador que acabamos de descargar en nuestro servidor, utilizando la dirección del servidor nfs que configuraremos

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual
buttons. You can popup a tools of currently selected element using corresp

You can press the **F1** key to get instant help, or visit www.virtualbox.org fo

centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
[root@ltsp-20186748 etc]# vim /var/lib/tftpboot/pxelinux.cfg/default
```

Right Ctrl

8:14 PM

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual ... nding toolbar buttons. You can popup a tools of currently selected element using corresp...

You can press the **F1** key to get instant help, or visit www.virtualbox.org fo...

centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
default centos7

label centos7
    kernel centos7/vmlinuz
    append initrd=centos7/initrd.img root=nfs:10.0.0.2:/var/lib/tftpboot/centos7/root rw selinux=0
~
"/var/lib/tftpboot/pxelinux.cfg/default" 6L, 158C                         6,0-1         All
```

Right Ctrl

8:14 PM

Ahora configuramos el servicio **nfs** accediendo al archivo **/etc/exports**, en este agregamos el directorio **/tftpboot/centos7/root**

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual ...nding toolbar buttons. You can popup a tools of currently selected element using corresp...

You can press the **F1** key to get instant help, or visit www.virtualbox.org fo...

centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
[root@ltsp-20186748 etc]# vim /etc/exports
```

Right Ctrl

8:15 PM

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual ... nding toolbar buttons. You can popup a tools of currently selected element using corresp...

You can press the **F1** key to get instant help, or visit www.virtualbox.org fo...

centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
/var/lib/tftpboot/centos7/root 10.0.0.0/24(rw,no_root_squash)
~
"/etc/exports" 1L, 62C                                      1,1          All
```

Right Ctrl

8:15 PM

Por último iniciamos el servicio **xinetd**

Oracle VM VirtualBox Manager

File Machine Help

Preferences Import Export New Add

Welcome to VirtualBox!

The left part of application window contains global tools and lists ... corresponding toolbar buttons. You can popup a tools of currently selected element usin...

You can press the **F1** key to get instant help, or visit www.virtualb...

centosServer-20186748 (Genisys) [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
none    /tmp            tmpfs   defaults        0       0
tmpfs   /dev/shm        tmpfs   defaults        0       0
sysfs   /sys            sysfs   defaults        0       0
proc    /proc           proc    defaults        0       0
[root@ltsp-20186748 ~]# cat /var/lib/tftpboot/centos7/root/etc/fstabs
none    /tmp            tmpfs   defaults        0       0
tmpfs   /dev/shm        tmpfs   defaults        0       0
sysfs   /sys            sysfs   defaults        0       0
proc    /proc           proc    defaults        0       0
[root@ltsp-20186748 ~]# systemctl status xinetd
● xinetd.service - Xinetd A Powerful Replacement For Inetd
   Loaded: loaded (/usr/lib/systemd/system/xinetd.service; enabled; vendor preset: enabled)
   Active: inactive (dead)
[root@ltsp-20186748 ~]# systemctl staart xinetd
Unknown operation 'staart'.
[root@ltsp-20186748 ~]# systemctl start xinetd
[root@ltsp-20186748 ~]# systemctl enable xinetd
[root@ltsp-20186748 ~]# systemctl status xinetd
● xinetd.service - Xinetd A Powerful Replacement For Inetd
   Loaded: loaded (/usr/lib/systemd/system/xinetd.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2019-11-18 19:27:26 EST; 11s ago
 Main PID: 26730 (xinetd)
   CGroup: /system.slice/xinetd.service
           └─26730 /usr/sbin/xinetd -stayalive -pidfile /var/run/xinetd.pid

Nov 18 19:27:26 ltsp-20186748 xinetd[26730]: removing daytime
Nov 18 19:27:26 ltsp-20186748 xinetd[26730]: removing discard
Nov 18 19:27:26 ltsp-20186748 xinetd[26730]: removing discard
Nov 18 19:27:26 ltsp-20186748 xinetd[26730]: removing echo
Nov 18 19:27:26 ltsp-20186748 xinetd[26730]: removing echo
Nov 18 19:27:26 ltsp-20186748 xinetd[26730]: removing tcpmux
Nov 18 19:27:26 ltsp-20186748 xinetd[26730]: removing time
Nov 18 19:27:26 ltsp-20186748 xinetd[26730]: removing time
Nov 18 19:27:26 ltsp-20186748 xinetd[26730]: xinetd Version 2.3.15 started with libwrap loadav...in.
Nov 18 19:27:26 ltsp-20186748 xinetd[26730]: Started working: 1 available service
Hint: Some lines were ellipsized, use -l to show in full.
[root@ltsp-20186748 ~]# _
```

Right Ctrl

8:27 PM

Configuración del cliente

Como prueba de la funcionalidad de nuestro servidor de terminales, procedemos a agregar una nueva máquina en virtualbox, esta vez sin disco duro

Oracle VM VirtualBox Manager

File Machine Help

Tools

Server-lab

Centos

w7-32
Powered Off

Preferences Import Export New Add

Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual machines and virtual machine groups on your computer.
You can imp ols of currently selected element
using corres

You can pre latest news.

Create Virtual Machine

Name and operating system

Please choose a descriptive name and destination folder for the new virtual machine and select the type of operating system you intend to install on it. The name you choose will be used throughout VirtualBox to identify this machine.

Name: centos-client-20186748

Machine Folder: C:\Users\jp135\VirtualBox VMs

Type: Linux

Version: Red Hat (64-bit)

Expert Mode Next Cancel

8:28 PM

Oracle VM VirtualBox Manager

File Machine Help

Tools

Server-lab

Centos

w7-32
Powered Off

Preferences Import Export New Add

Welcome to VirtualBox!

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You can imp ols of currently selected element
using corres

You can pre latest news.

Create Virtual Machine

Memory size

Select the amount of memory (RAM) in megabytes to be allocated to the virtual machine.

The recommended memory size is **1024** MB.

1024 MB

4 MB 8192 MB

Next Cancel

8:28 PM

Oracle VM VirtualBox Manager

File Machine Help

Tools

Server-lab

Centos

w7-32
Powered Off

Preferences Import Export New Add

Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual machines and virtual machine groups on your computer.
You can imp ols of currently selected element
using corres

You can pre latest news.

Create Virtual Machine

Hard disk

If you wish you can add a virtual hard disk to the new machine. You can
either cr from another
location

If you ne tep and make
the chan ed.

The reco

Do no

Create

Use a

NewVirtualDisk1.vdi (Normal, 8.00 GB)

Create Cancel

VirtualBox - Warning

You are about to create a new virtual machine without a hard disk. You will not be able to install an operating system on the machine until you add one. In the mean time you will only be able to start the machine using a virtual optical disk or from the network.

Continue Go Back

8:28 PM

Luego en las configuraciones del sistema de nuestra máquina virtual deshabilitamos todos los métodos de boot y solo permitimos los medios de red. Luego colocamos nuestra máquina en la misma red de nuestro servidor

Oracle VM VirtualBox Manager

File Machine Snapshot Help

Tools

Server-lab

Centos

w7-32
Powered Off

centos-client-20186748
Powered Off

centos-client-20186748 - Settings

General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface

System

Motherboard | Processor | Acceleration

Base Memory: 1024 MB
4 MB 8192 MB

Boot Order:
- [x] Network
- [ ] Floppy
- [ ] Optical
- [ ] Hard Disk

Chipset: PIIX3

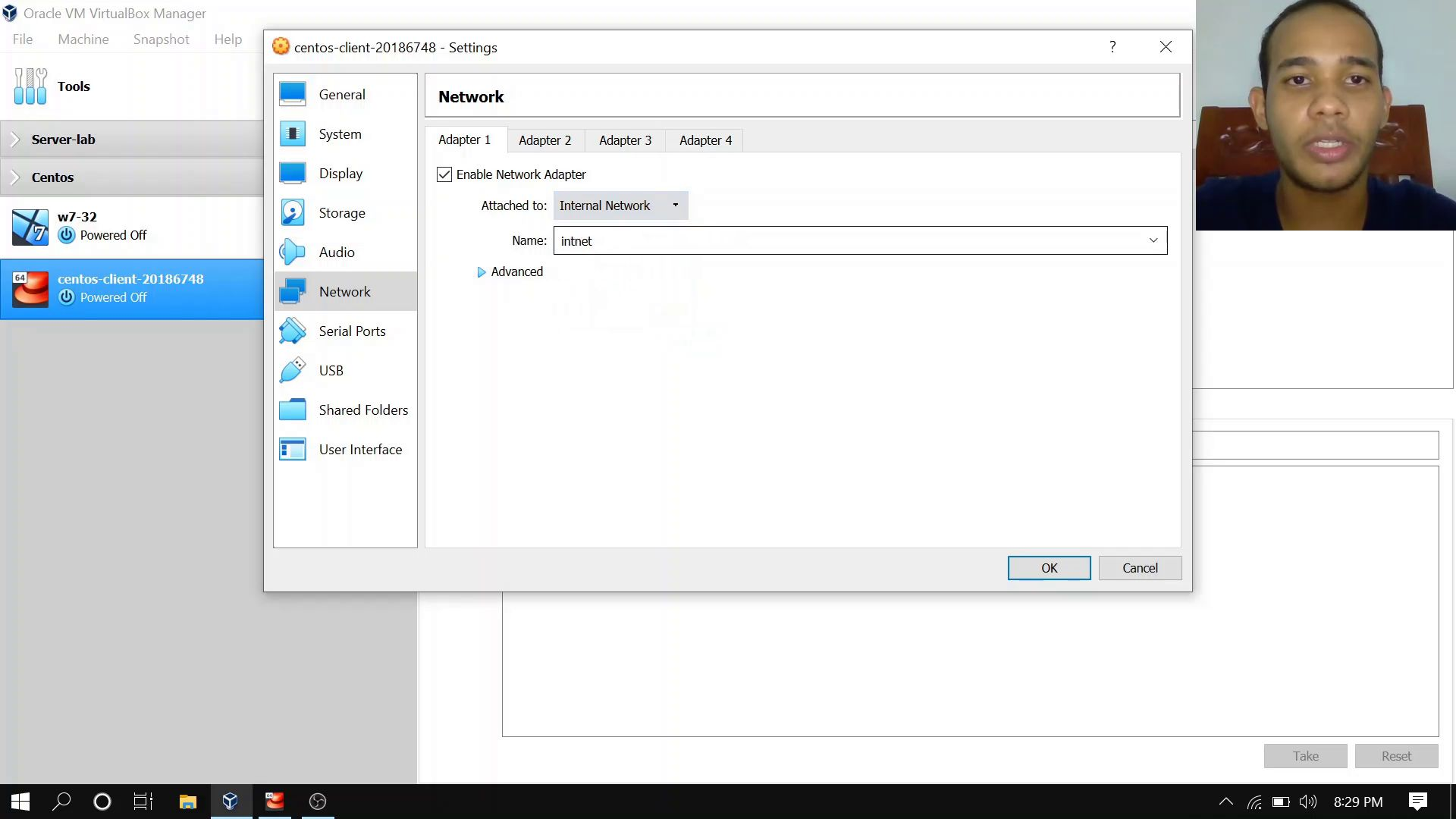
Pointing Device: PS/2 Mouse

Extended Features:
- [x] Enable I/O APIC
- [ ] Enable EFI (special OSes only)
- [x] Hardware Clock in UTC Time

OK Cancel

Take Reset

8:29 PM


Oracle VM VirtualBox Manager
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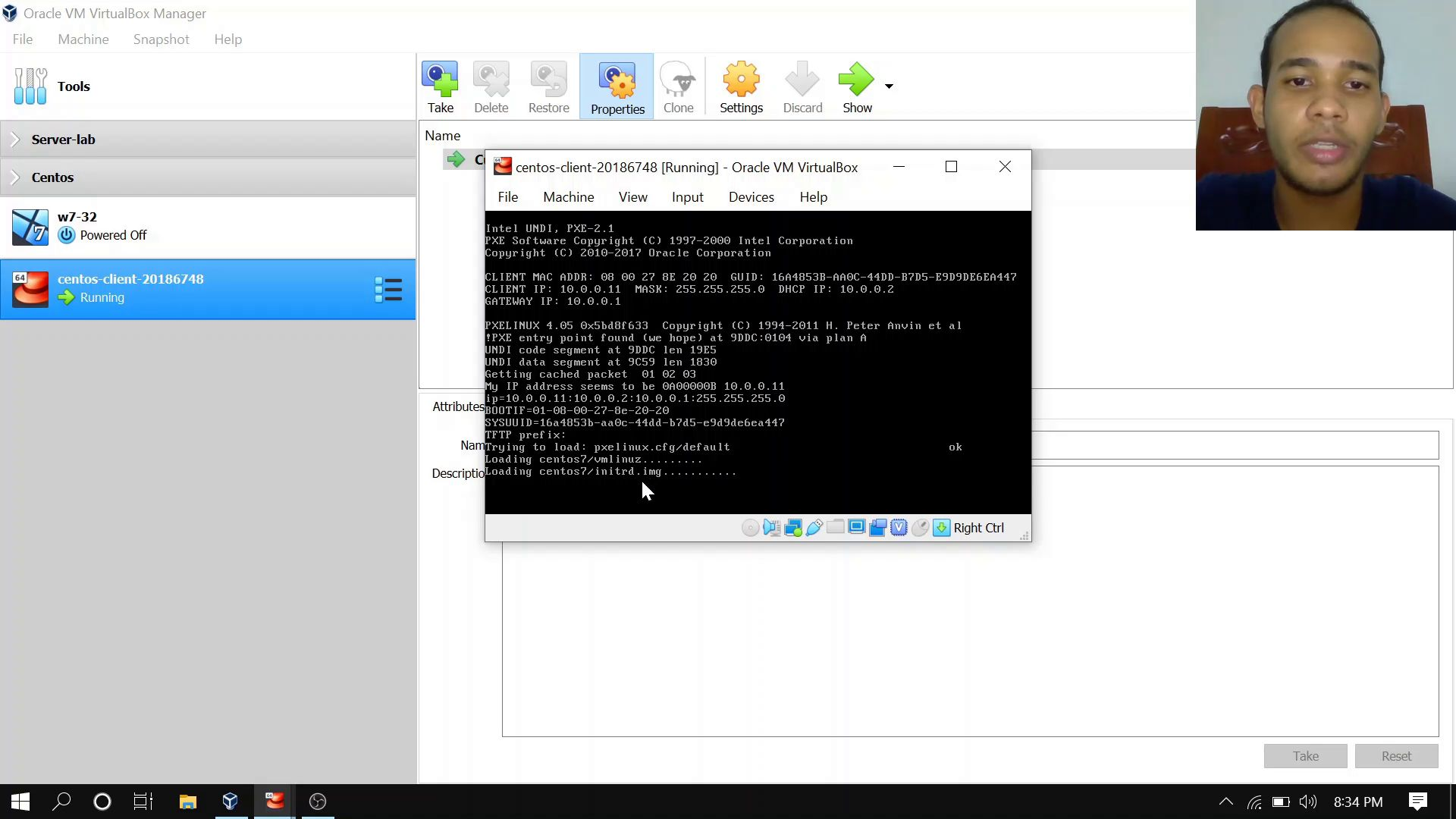
Help
Tools
Server-lab
Centos
w7-32
Powered Off
centos-client-20186748
Powered Off
centos-client-20186748 - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Network
Adapter 1
Adapter 2
Adapter 3
Adapter 4
Enable Network Adapter
Attached to:
Internal Network
Name:
intnet
Advanced
OK
Cancel
Take
Reset
8:29 PM

Al iniciar la máquina, vemos que esta inmediatamente obtiene una dirección de nuestro servidor dhcp, y comienza el proceso de inicialización del sistema para nuestro cliente. Una vez termina el proceso el podemos ver como el sistema inicia completamente, debido a ser la primera vez que el usuario que generamos inicia en el sistema vemos como se inicia el proceso de configuración inicial, una vez lo completamos podemos comenzar a utilizar nuestro computador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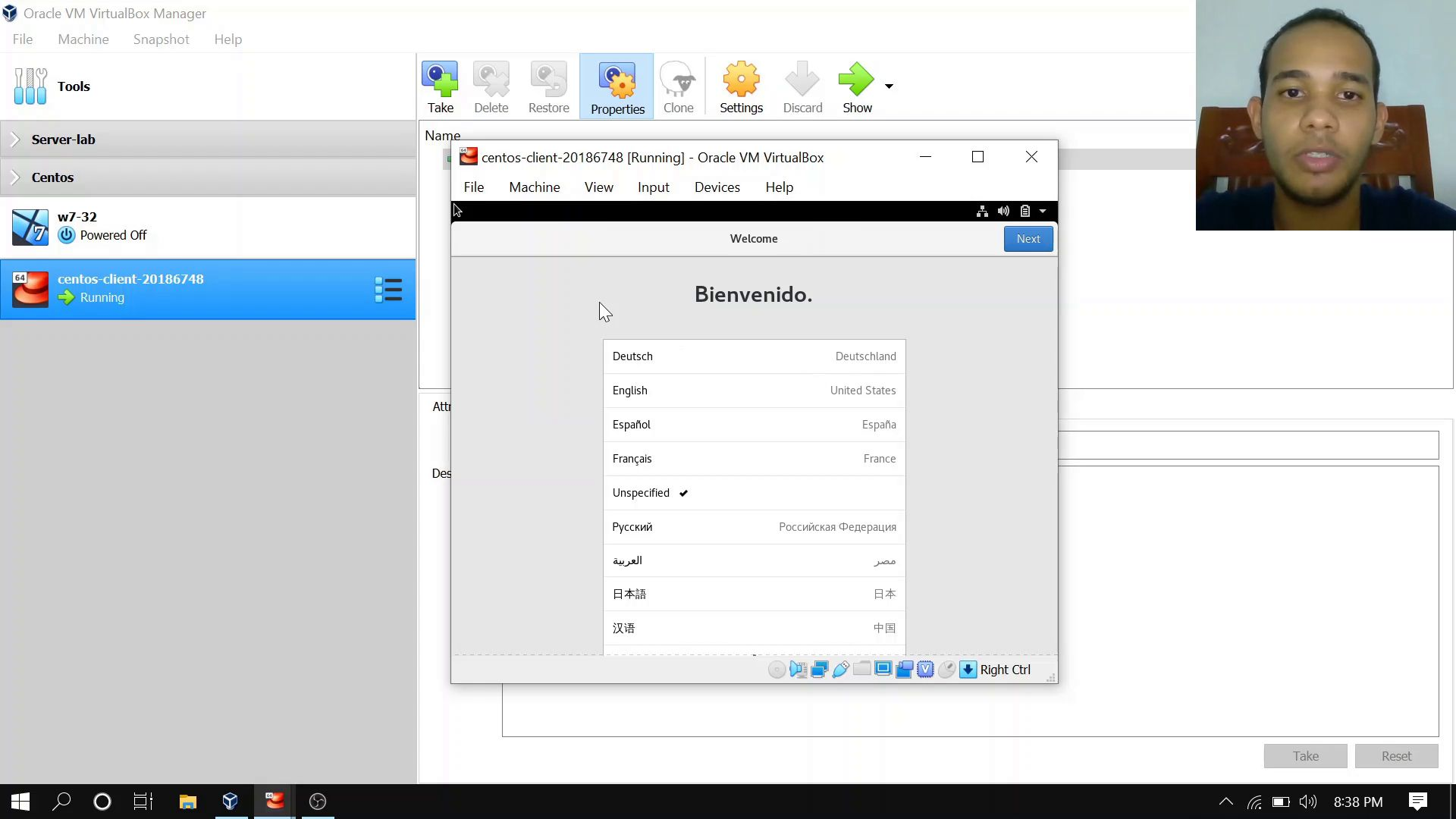
centos-client-20186748
Running
Take Delete Restore Properties Clone Settings Discard Show
Name
centos-client-20186748 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Intel UNDI, PXE-2.1
PXE Software Copyright (C) 1997-2000 Intel Corporation
Copyright (C) 2010-2017 Oracle Corporation
CLIENT MAC ADDR: 08 00 27 8E 20 20 GUID: 16A4853B-AA0C-44DD-B7D5-E9D9DE6EA447
CLIENT IP: 10.0.0.11 MASK: 255.255.255.0 DHCP IP: 10.0.0.2
GATEWAY IP: 10.0.0.1
PXELINUX 4.05 0x5bd8f633 Copyright (C) 1994-2011 H. Peter Anvin et al
!PXE entry point found (we hope) at 9DDC:0104 via plan A
UNDI code segment at 9DDC len 19E5
UNDI data segment at 9C59 len 1830
Getting cached packet 01 02 03
My IP address seems to be 0A00000B 10.0.0.11
ip=10.0.0.11:10.0.0.2:10.0.0.1:255.255.255.0
BOOTIF=01-08-00-27-8e-20-20
SYSUUID=16a4853b-aa0c-44dd-b7d5-e9d9de6ea447
TFTP prefix:
Trying to load: pxelinux.cfg/default ok
Loading centos7/vmlinuz.....
Loading centos7/initrd.img.....
Right Ctrl
Attributes
Name
Description
Take
Reset
8:34 PM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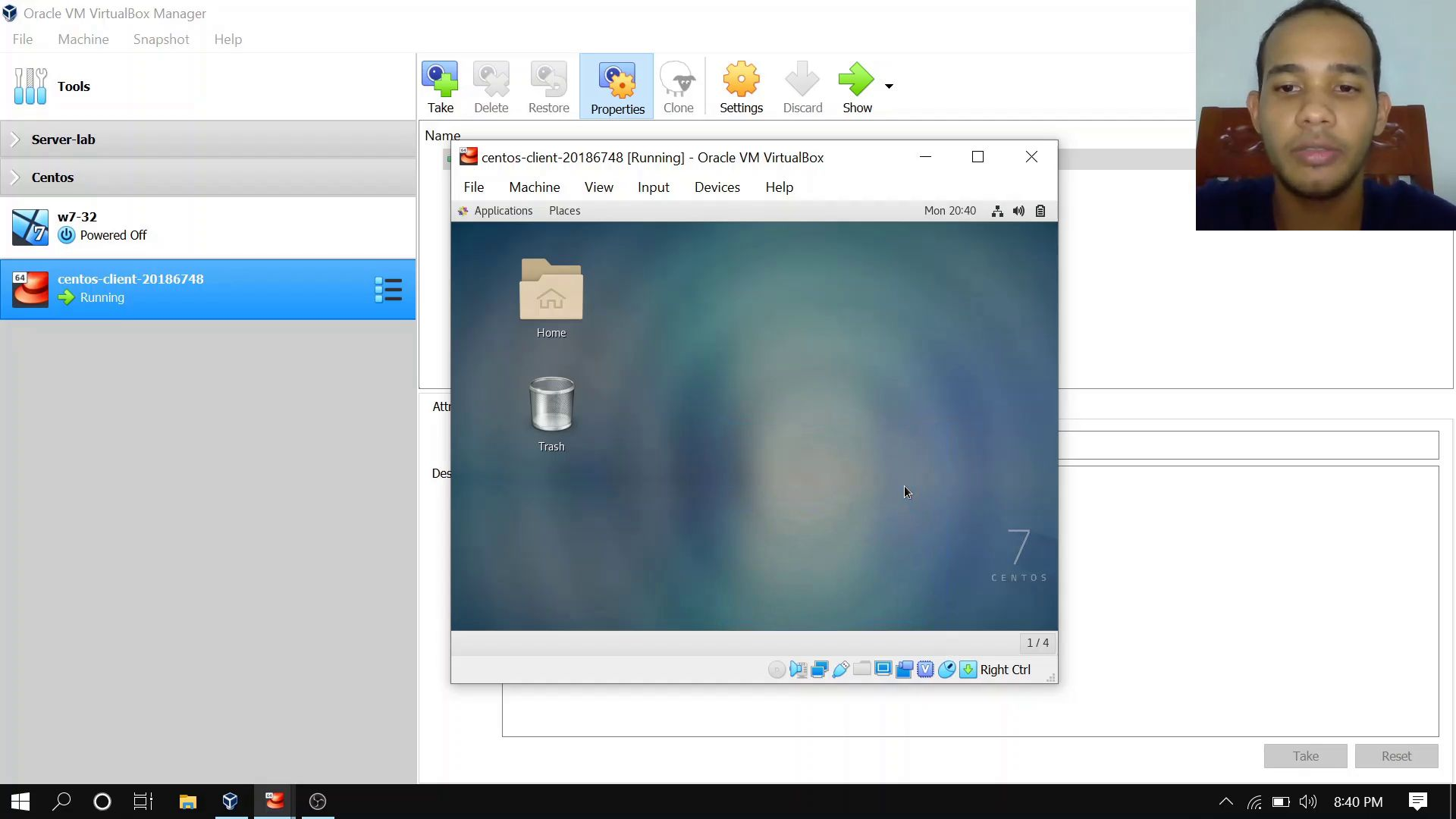
Centos
w7-32
Powered Off
centos-client-20186748
Running
Take
Delete
Restore
Properties
Clone
Settings
Discard
Show
Name
centos-client-20186748 [Running] - Oracle VM VirtualBox
File
Machine
View
Input
Devices
Help
Welcome
Next
Bienvenido.
Deutsch
Deutschland
English
United States
Español
España
Français
France
Unspecified
Русский
Российская Федерация
العربية
مصر
日本語
日本
汉语
中国
Right Ctrl
Take
Reset
8:38 PM


Oracle VM VirtualBox Manager
File
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Delete
Restore
Properties
Clone
Settings
Discard
Show
Name
Server-lab
Centos
w7-32
Powered Off
centos-client-20186748
Running
centos-client-20186748 [Running] - Oracle VM VirtualBox
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