Kyiv College of Communications

Cycle Commission of Computer Engineering

**PERFORMANCE REPORT**

**WORK-CASE №3**

*in discipline: "Operating systems"*

*Topic: "Linux commands for archiving and compressing data"*

Performed by students

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1. **To create a complete copy of an existing machine, follow these steps:**

**The material was prepared by student Makarenko D.A.**

1. Open the VirtualBox environment.
2. Right-click on the car you want to copy and select the "Copy" button.
3. Enter the machine name and select the path where the copy will be created (Select full copy)
4. Copy created.

**2. For export:**

**The material was prepared by student Makarenko D.A.**

1. Right-click on the desired machine, select "export".
2. Configure the required parameters.

**3. Network Address Broadcasting (NAT)**

**The material was prepared by student Nemechkin M.D.**

NAT allows the guest operating system to access the Internet using private IP, which is not available from the external network or for all machines on the local physical network. This network setting allows you to visit web-pages, download files, view e-mail. And all this using a guest operating system. However, it is not possible to connect directly to such a system from the outside if it uses NAT.

The principle of translation of network addresses is as follows. When the guest OS sends packets to a specific address of a remote machine on the network, the NAT service running VirtualBox intercepts these packets, extracts segments containing the address of the sending point (IP address of the guest operating system) and replaces them with IP. host machine address. Then he packs them again and sends them to the specified address.

NAT is useful when it doesn't matter which IP addresses the guest OS on the virtual machine uses, as they will all be unique. However, if you want to configure network traffic redirection, or expand the functionality of the guest OS by deploying a web server (for example), you need additional settings. Features such as sharing folders and files are also not available in NAT mode.

**4. Bridged Bridge**

**The material was prepared by student Nemechkin M.D.**

In a network bridge connection, the virtual machine works in the same way as other computers on a network. In this case, the adapter acts as a bridge between virtual and physical networks. From the external network it is possible to connect directly to the guest operating system.

The adapter in Network Bridge mode connects, bypassing the host, to a device that distributes IP addresses within the local network for all physical network cards. VirtualBox connects to one of the installed network cards and transmits packets through it directly; the work of the bridge through which data is transferred turns out. Typically, the adapter in the "Network Bridge" model receives a standard address from the range 192.168.x.x from the router. Therefore, a virtual machine on a network looks like a normal physical device that is no different from others.

**5. Host-only virtual adapter**

**The material was prepared by student Nemechkin M.D.**

When connecting to a Virtual Host Adapter, guest operating systems can interact with each other and with the host. But all this is only inside the virtual machine VirtualBox. In this mode, the host adapter uses its own dedicated device called vboxnet0. They also create a subnet and assign IP addresses to network cards of guest operating systems. Guest operating systems are unable to interact with devices on the external network because they are connected to it through a physical interface. Virtual Host Adapter mode provides a limited set of services useful for creating private networks under VirtualBox for guest operating systems.

Unlike other virtualization products, the NAT adapter in VirtualBox cannot act as a bridge between the default network device on the hosts. Therefore, it is impossible to have direct access from the outside to machines "hidden" by NAT - nor to programs running on them; nor to the data on the hosts themselves.

**6. Internal Network**

**The material was prepared by student Makarenko D.A.**

The internal network, according to the VirtualBox manual, is "a software network that may be visible to selectively installed virtual machines, but not to applications running on a host or remote machines located externally." Such a network is a set of a host and several virtual machines. But none of the above devices have access through a physical network adapter - it is fully software used by VirtualBox as a network router. In general, a private LAN is available only for guest operating systems without Internet access, which makes it as secure as possible. It is possible to use such a network - a top-secret server with clients, designed for development; testing systems for penetration or any other purpose that has to create an internal network for development teams or organizations. This is an ideal way to block the environment from unauthorized software installation, download or upload files, visit Facebook-type services during business hours.