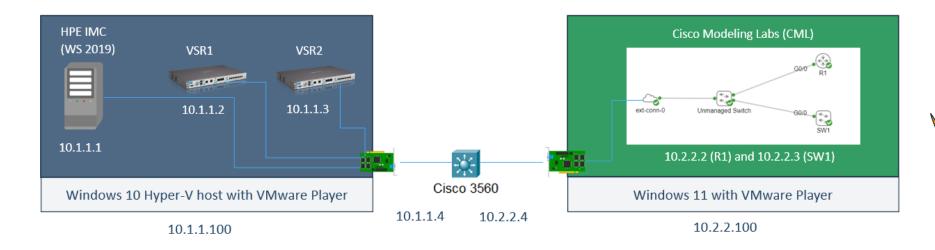
### Virtualization and Networking

#### Lecture 8





SoftUni Team
Technical Trainers





**Software University** 

https://softuni.bg

### **Table of Contents**



- 1. Virtualization and networking
- 2. Network management systems
- 3. Demonstration



### Questions





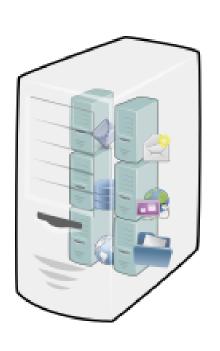


Virtualization and Networking

### Why Virtualization?



- You get the most out of your server hardware
- Easier configuration for redundancy and backup
- Simplified management
- Fast provisioning of new machines
- Saves energy and costs



### Types of Virtualization

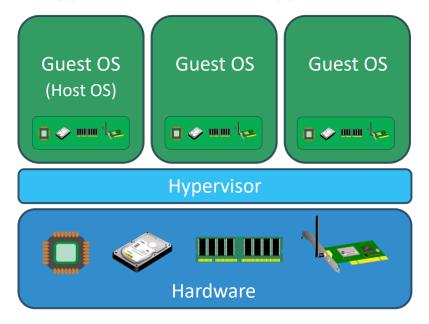


- OS virtualization
- Application virtualization
- Network virtualization
- Storage virtualization
- Others...

### **OS Virtualization Types**

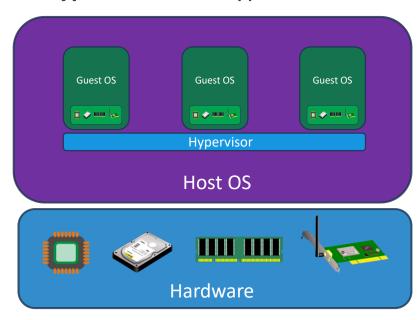


**Type 1** - Bare Metal hypervisor



- Very fast access to the hardware
- Examples:
  - VMware ESXi
  - Microsoft Hyper-V
  - Citrix XenServer
  - KVM (Kernel-based Virtual Machine)

**Type 2** - Hosted hypervisor



- Slower access to the hardware
- Examples:
  - VMware Workstation (Player)
  - Oracle VirtualBox
  - Microsoft Virtual PC
  - Parallels Desktop for MAC
  - QEMU (Quick Emulator)

### **Hyper-V and Virtual Networks**

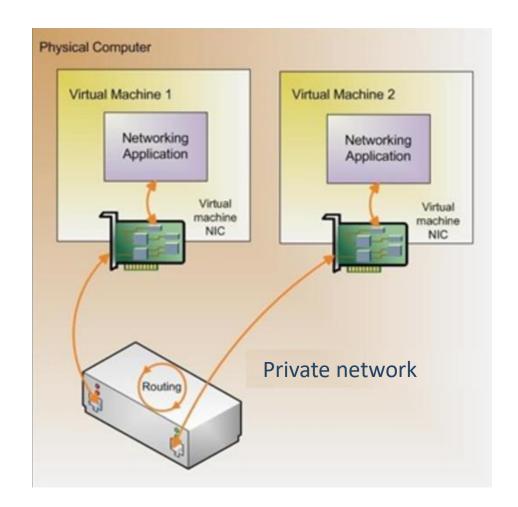


- In Hyper-V, when you create a new network, you create a new virtual switch
- You can create different types of networking (switches), depending on your needs:
  - Private
  - Internal
  - External

### **Hyper-V Private Network**



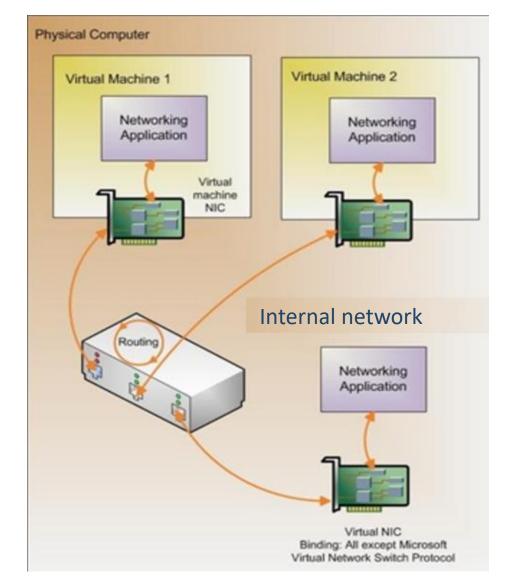
- Provides VM to VM connectivity only
- No external communication
- No communication with the host



### **Hyper-V Internal Network**



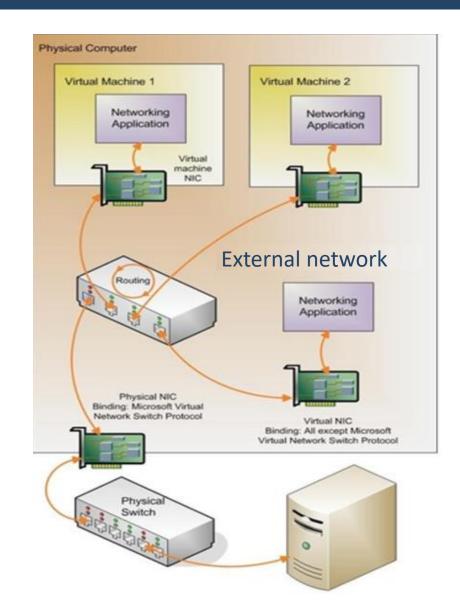
- Provides VM to VM connectivity
- Also provides communication with the host
- No external communication



### **Hyper-V External Network**



- Provides VM to VM connectivity
- Provides communication with the host
- Provides external communication



### VMware Workstation and Virtual Networks



- In VMware Workstation (Player), several virtual adapters can be added to the host OS and they represent connections to different virtual switches (or networks):
  - VMnet0 represents a <u>bridge</u>. You can decide and manually assign the exact physical interface to be bridged
  - VMnet1 represents the <u>host-only</u> switch
  - VMnet8 represents <u>NAT</u>, which is performed by the host
- Custom connections/networks can also be created

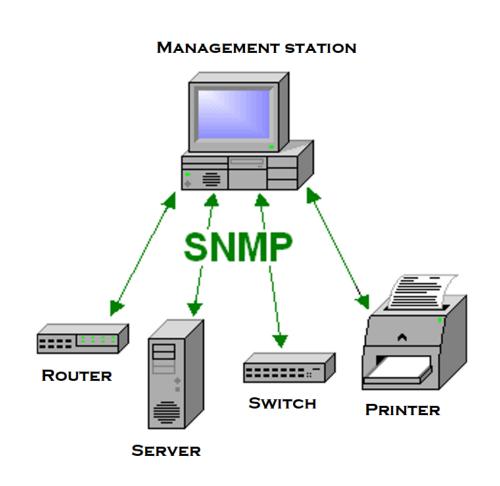


Network Management Systems

### What is a Network Management System?



- A central "hub" to monitor and manage multiple devices
- Advantages:
  - Easy to manage your network
  - Saves time
  - Cost effective
  - Decreases downtime
  - ...more?



### **NMS and Protocols**



- Quite often network management systems use these common protocols (any combination of them) to access the devices:
  - Simple Network Management Protocol (SNMP)
  - Telnet
  - SSH



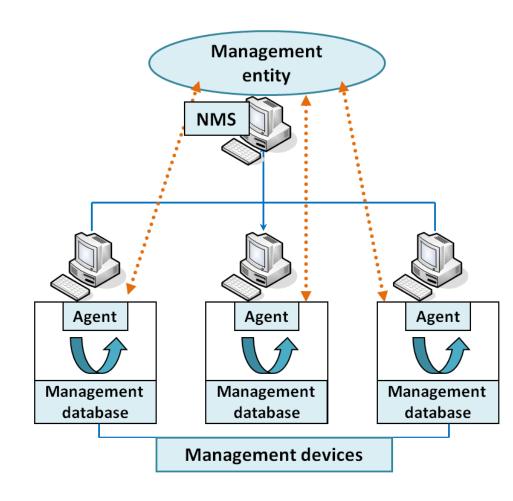
## **Network Management**

**SNMP Overview** 

### **SNMP Components**



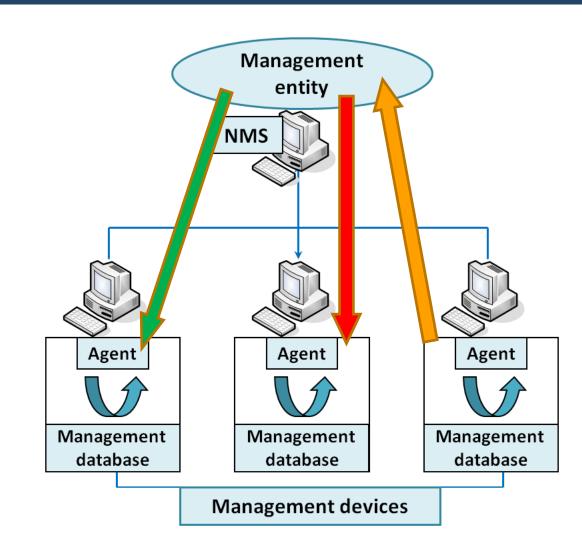
- Agent
- Management station (NMS)
- SNMP messages
- Management information base (MIB)



### **SNMP Message Types**



- Get Read only
- Set Read/Write
- Trap generated by the agent

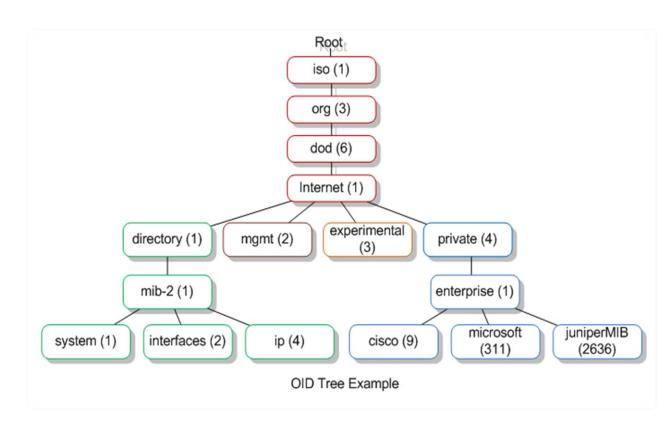


<sup>\*</sup> SNMP uses UDP port 161 (162 for trap)

### **SNMP MIB**



- MIB: Management Information
   Base
- Collection of information organized hierarchically
- Each entry in MIB is addressed through OID (object ID)
- MIB structure must be known by the NMS and the agents



### **SNMP Versions**

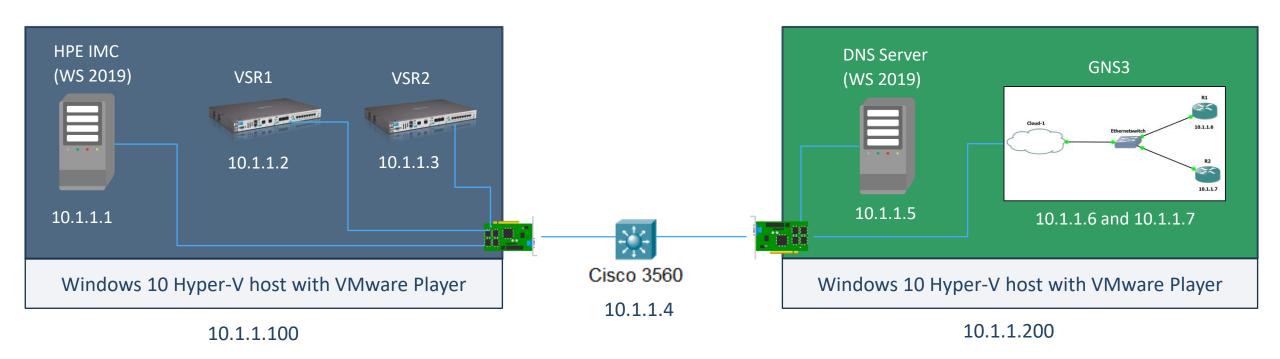


- SNMP v1
  - poor security
  - not very good performance
- SNMP v2c
  - poor security
  - better performance
- SNMP v3
  - Secure and with good performance
  - More difficult to configure



### Previous demo 1 (without routing)

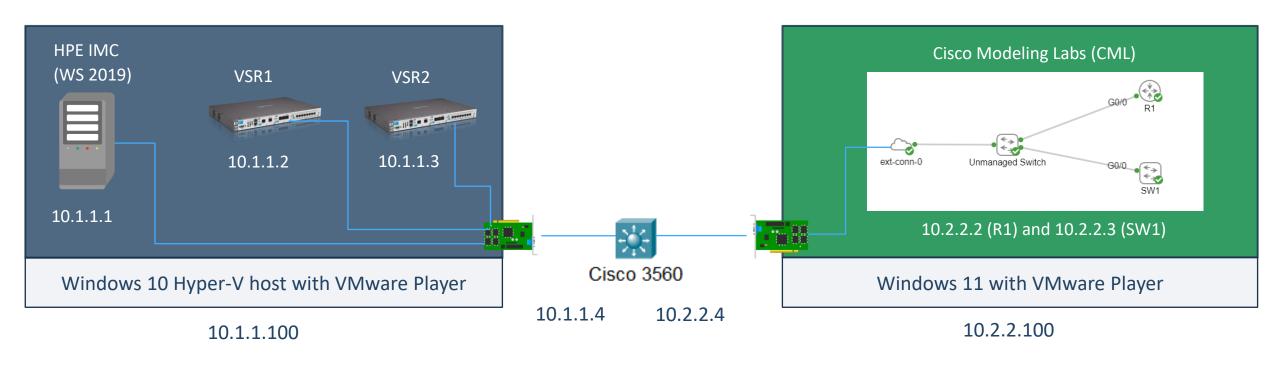




<sup>\*</sup> All masks are /24

### Previous demo 2 (with routing)

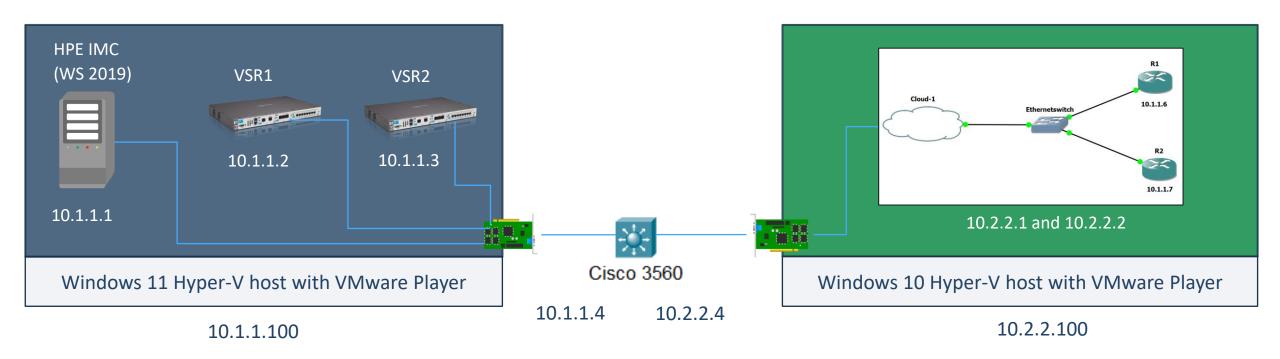




<sup>\*</sup> All masks are /24

### Previous demo 3 (with routing)

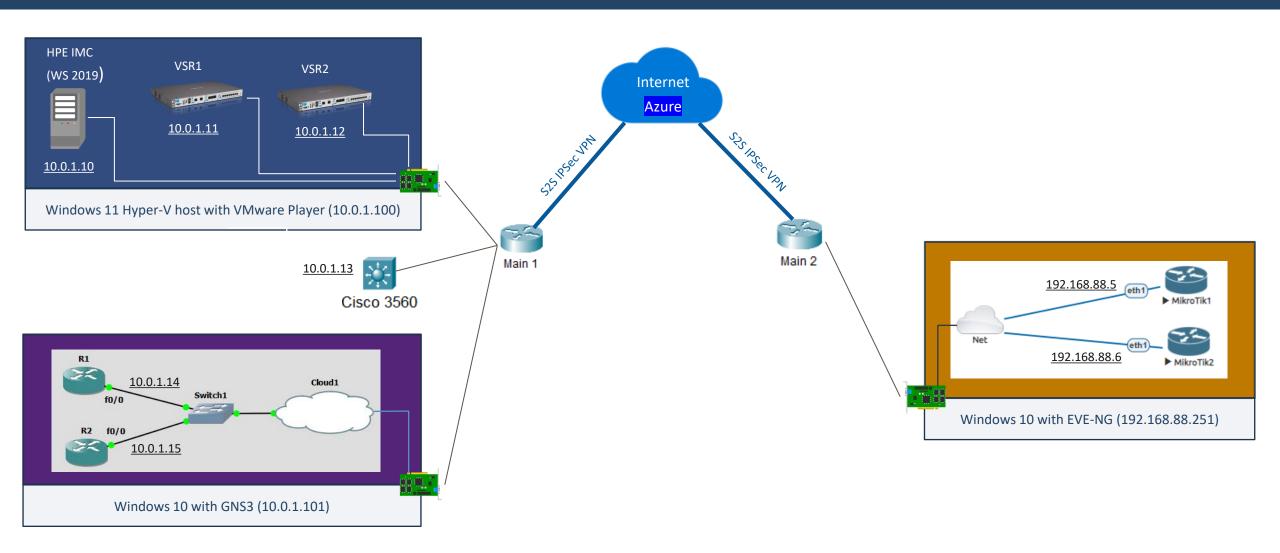




<sup>\*</sup> All masks are /24

### **Current demo**





<sup>\*</sup> All masks are /24

### Summary



- 1. Virtualization and networking
- 2. Network management systems
- 3. Demonstration





# Questions?

















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Решения за твоето утре













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