

ASK4 Software Engineer Developer Assessment

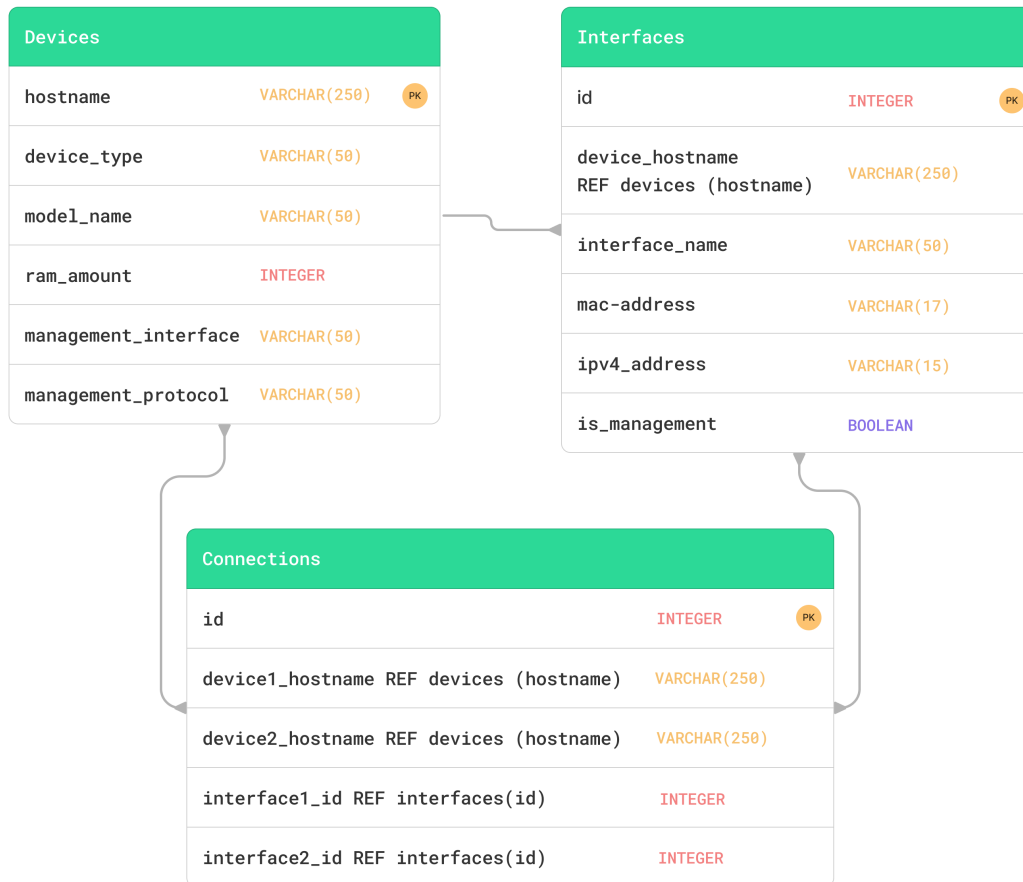
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Vacancy Reference: ASK990650

Requirements

- ▶ *The script will take a single argument: the hostname of the device.*
- ▶ *The script will query the database to retrieve essential information about the device management interface.*
- ▶ *Depending on the type of management interface, it will utilize either the 'SSHClient' or 'TelnetClient' class to establish a connection to the device and execute a command to list interface configurations.*
- ▶ *The script will parse the command output according to the operating system of the device and extract relevant interface details.*
- ▶ *The script will then print the name, MAC address, and IP address of each interface in CSV format, with one interface per line.*
- ▶ *The code should be designed to be easily extendable to accommodate additional operating systems with varying command formats and response structures.*
- ▶ *Emphasis should be placed on modularity and abstraction in the script design. This facilitates future modifications or additions.*

Database Design



Devices Table

- ▶ *The Devices table stores information about different devices in a network.*
- ▶ *It includes the following attributes:*
 - *hostname: The unique identifier for the device.*
 - *device_type: Describes the type of device (e.g., switch, server).*
 - *os_type: Specifies the operating system type running on the device.*
 - *model_name: The name or model of the device.*
 - *ram_amount: The amount of RAM (random access memory) installed on the device.*
 - *management_interface: Indicates the interface used for management purposes.*
 - *management_protocol: Specifies the protocol used for device management (e.g., SSH, Telnet).*

Interfaces Table

- ▶ *The Interfaces table stores information about network interfaces of devices.*
- ▶ *It contains the following attributes:*
 - *id: Unique identifier for the interface.*
 - *device_hostname: Foreign key referencing the hostname of the device to which the interface belongs.*
 - *interface_name: The name of the interface.*
 - *mac_address: The MAC (media access control) address of the interface.*
 - *ipv4_address: The IPv4 address assigned to the interface.*
 - *is_management: Indicates whether the interface is used for management purposes (Boolean).*
- ▶ *A unique constraint ensures that each combination of device hostname and interface name is unique.*

Connections Table

- ▶ *The Connections table represents connections between devices.*
- ▶ *It includes the following attributes:*
 - *id: Unique identifier for the connection.*
 - *device1_hostname: Foreign key referencing the hostname of the first device in the connection.*
 - *device2_hostname: Foreign key referencing the hostname of the second device in the connection.*
 - *interface1_id: Foreign key referencing the ID of the interface on the first device.*
 - *interface2_id: Foreign key referencing the ID of the interface on the second device.*
- ▶ *A unique constraint ensures that each combination of device1_hostname and device2_hostname is unique, preventing duplicate connections between the same devices.*

Outputs

```
→ src php NetworkManager.php device1
Management Interface: eth0
MAC Address: 00:11:22:33:44:55
IPv4 Address: 192.168.1.1
OS Type: LinuxOS
Management Protocol: SSH

Interface| IP Address | MAC Address
enp3s0 | 10.50.245.40 | fc:aa:14:6d:39:ae
virbr0 | 192.168.122.1 | 52:54:00:e7:dd:dc
virbr1 | 192.168.125.1 | 52:54:00:12:0d:4a
→ src █
```

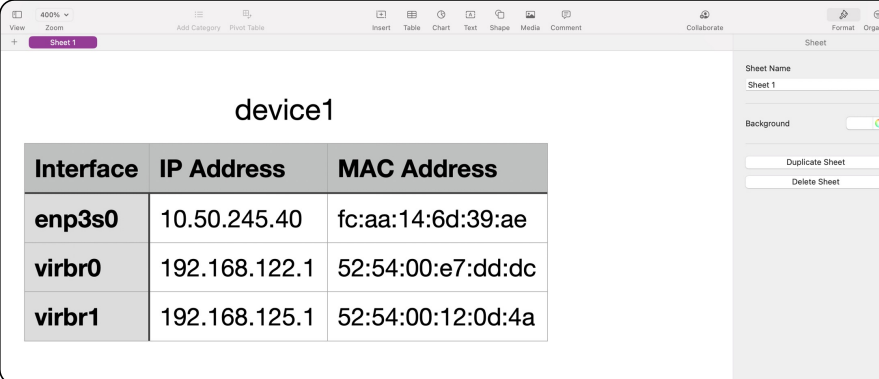
1.Interfaces extracted from [LinuxLikeOS](#) response

```
→ src php NetworkManager.php device2
Management Interface: vlan1
MAC Address: 11:22:33:44:55:66
IPv4 Address: 192.168.1.3
OS Type: SwitchOS
Management Protocol: Telnet

Interface| IP Address | MAC Address
Ethernet0/0 | 10.1.0.1 | 0003.e39b.9220
GigabitEthernet0/1 | 1.2.0.1 | 0015.5b46.5300
→ src █
```

2.Interfaces extracted from [SwitchLikeOS](#) response

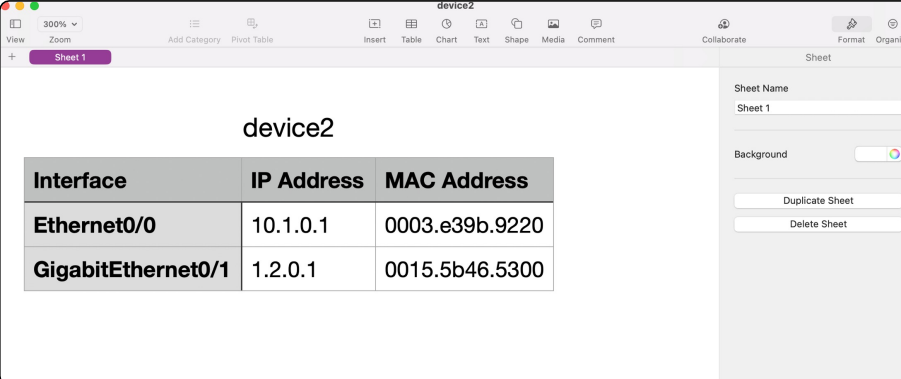
Output-CSV



device1

Interface	IP Address	MAC Address
enp3s0	10.50.245.40	fc:aa:14:6d:39:ae
virbr0	192.168.122.1	52:54:00:e7:dd:dc
virbr1	192.168.125.1	52:54:00:12:0d:4a

device1.csv



device2

Interface	IP Address	MAC Address
Ethernet0/0	10.1.0.1	0003.e39b.9220
GigabitEthernet0/1	1.2.0.1	0015.5b46.5300

device2.csv

Unit testing

```
→ src phpunit --testdox
PHPUnit 11.0.9 by Sebastian Bergmann and contributors.

Runtime:      PHP 8.3.4
Configuration: /Users/sanjay/Downloads/ask4-developer-test/src/phpunit.xml

.....                                     7 / 7 (100%)

Time: 00:00.094, Memory: 8.00 MB

Device Client
✓ S s h client send command
✓ Telnet client send command

Get Management Int
✓ Constructor
✓ Get management interface details with valid hostname
✓ Get management interface details with invalid hostname

Linux OS
✓ Linux o s parse handler

Switch OS
✓ Switch o s parse handler

OK (7 tests, 14 assertions)
→ src █
```