

# HP2-Z31<sup>Q&As</sup>

Creating HP Software-defined Networks

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**QUESTION 1**

Which HP IMC SDN Manager functionality provides a detailed overview of OpenFlow counters and DPIDs?

- A. SDN Manager flow entry management
- B. SDN Manager OpenFlow device management
- C. SDN Manager dashboard
- D. SDN Manager service flow management

Correct Answer: B

OpenFlow device management

Displays all the flow entries, counters, DPIDs, and other OpenFlow statistics per device Helps locate OpenFlow devices within the network topology Reference: HP IMC Virtual Application Networks Software-defined Networking Manager Software (page 2) <http://www8.hp.com/h20195/v2/GetPDF.aspx%2F4AA4-9879ENN.pdf>

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**QUESTION 2**

Refer to the exhibit.

Mode	: Active
Flow Location	: Hardware and Software
No. of Hw Flows	: 6
No. of Sw Flows	: 1
Hw. Rate Limit	: 0 kbps
Sw. Rate Limit	: 100 pps
Conn. Interrupt Mode	: Fail-Secure
Maximum Backoff Interval	: 60 seconds
Probe Interval	: 10 seconds
Hw. Table Miss Count	: NA
No. of Sw Flow Tables	: 1
Egress Only Ports	: None
Table Model	: Policy Engine and Software

A network engineer wants to use `dpctl` to make flow modifications directly on an HP 3800 switch flow table. Can the engineer make the changes using `dpctl` on the switch in the exhibit?

- A. The engineer is unable to connect to the switch directly. `Dpctl` requires OpenFlow 1.0, and (he switch is currently configured to use OpenFlow 1.3.
- B. The engineer is able to connect to the switch directly using `dpctl`, but is unable to use `dpctl` to update the flow entries on the switch. `Ovs-ofctl` is required to make flow modifications when using OpenFlow

1.3.

C. The engineer is able to connect to the switch directly using dpctl. The engineer will then need to use the correct OpenFlow 1.3 syntax to make flow modifications using dpctl.

D. The engineer is unable to connect to the switch directly. Once the correct configuration is completed on the switch, the engineer will be able to connect directly and then use the correct OpenFlow 1.3 syntax to make flow modifications using dpctl

Correct Answer: C

dpctl

The HP supports a passive listening port per OpenFlow instance. This is super-useful when you want to debug an individual switch without going through the controller.

Add a listener port:

```
openflow listener tcp:6633
```

Then use dpctl. Examples:

```
dpctl dump-tables tcp::
```

```
dpctl dump-flows tcp::
```

```
dpctl add-flow tcp:: \in_port=104 actions=output:98\
```

---

### QUESTION 3

Which statement best describes software-defined networking (SDN)?

A. SDN allows software to leverage the network infrastructure, enabling a centralized and policy-based approach to network provisioning and traffic forwarding.

B. SDN allows administrators to share software, policies, templates, and applications between multiple virtual machines that are running on the same network.

C. SDN is another name for OpenFlow, a protocol that lets switches handle traffic with OpenFlow tables rather than MAC forwarding tables and routing tables.

D. SDN lets IT developers manage physical infrastructure devices directly without pre-defined templates or intermediary devices.

Correct Answer: A

The HP VAN SDN Controller is a Java-based OpenFlow controller enabling SDN solutions such as network controllers for the data center, public cloud, private cloud, and campus edge networks. This includes providing an open platform for developing experimental and special-purpose network control protocols using a built-in OpenFlow controller. The HP VAN SDN Controller is a platform for developing SDN applications and deploying SDN applications. The controller can be characterized as providing a Base Control Platform, a Distributed Platform for High-Availability and Scalability, and an Extensible Platform.

Reference: HP VAN SDN Controller Administrator Guide

**QUESTION 4**

An administrator wants to install the HP VAN SDN Controller in a production environment using virtualization technologies. Which hypervisors are supported? (Select two.)

- A. VirtualBox 4.2.20 and greater
- B. KVM Version 2.4.5-1 and greater
- C. Parallels 8.0 and greater
- D. VMware ESXi Versions 5.0.0, 5.0.1, and greater
- E. VMware workstation 9.0 and greater

Correct Answer: BD

Software you must install before you begin the controller installation process

\*

Operating system: Ubuntu 12.04 LTS 64-bit Server (Linux 3.2 kernel)

\*

Supported hypervisors (if operating system is run on a virtual machine): KVM Version 2.4.5-1 and greater ESXi Versions 5.0.0 and greater

Reference: HP VAN SDN Controller and Applications Support Matrix

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**QUESTION 5**

A company has an IRF-based, 2-tier FlexFabric architecture in its data center. The company is now increasing the amount of server virtualization and also adding more redundant connections across the network infrastructure backbone. Which benefit does software-defined networking (SDN) provide for this FlexFabric solution?

- A. SDN applications can extend the virtual switches inside hosts into the control plane of multiple physical infrastructure devices.
- B. SDN can help core routing switches handle more routing table entries without sacrificing performance.
- C. SDN extends the SNMP MIBs to include MIBs for virtual switches.
- D. SDN applications can help to provision network connectivity for virtual machines and to forward traffic across complex meshes of links

Correct Answer: A

Q: What is HP's SDN strategy?

A: Virtual Application Networks represent HP's software-defined network vision. By leveraging SDN-enabled infrastructure, control plane, applications and integrated management systems HP is creating an open ecosystem to drive new innovation in networking.

Q: What is the HP Virtual Application Networks SDN Controller?

A: The HP Virtual Application Networks SDN controller is an integral part of HP's Virtual Application Networks offering. The controller acts as the central building block for an abstracted control plane in the SDN architecture.

Reference: Virtual Application Networks Overview [http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA4-4714ENW.pdf?jumpid=em\\_r1165\\_ww/en/large/eg/RelatedLink/Virtual\\_Application\\_Networks\\_Overview\\_FAQs/resourcefinder/Jan\\_2013](http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA4-4714ENW.pdf?jumpid=em_r1165_ww/en/large/eg/RelatedLink/Virtual_Application_Networks_Overview_FAQs/resourcefinder/Jan_2013)

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## QUESTION 6

What are two challenges when planning to implement a BYOD environment? (Select two.)

- A. device state unknown
- B. device software inspection
- C. device not under central control
- D. device CA enrollment
- E. device inventory control

Correct Answer: BD

\* HP identifies the following main BYOD security challenges:

(B)

Protecting the network from malware

(D)

Providing secure access to the network

Scaling the network to meet demand

Ensuring an optimized Wi-Fi experience

\* The top BYOD security concerns for enterprise companies are:

+

loss of company or client data (picked by 67%)

+

(D) unauthorized access to company data or systems (57%) + (B) users downloading app or content with embedded security exploits (47%) + (B) malware infections (45%)

+

and lost or stolen devices (41%)

Reference: Bring your own device (BYOD), FAQs [http://h17007.www1.hp.com/docs/byod/faq\\_4AA4-5466ENW.pdf](http://h17007.www1.hp.com/docs/byod/faq_4AA4-5466ENW.pdf)

## QUESTION 7

Which mechanism provides authentication of API calls via the REST API within the HP VAN SDN Controller?

- A. Openstack Keystone
- B. Java
- C. RabbitMQ
- D. Openstack

Correct Answer: A

The SDN controller uses Openstack Keystone as an identity management for managing users, generating tokens, as well as token validation.

Reference: HP VAN SDN Controller Administrator Guide

## QUESTION 8

Refer to the exhibit.

					Summary	Ports	Flows
Table ID	Priority	Packets	Bytes	Matches	Actions/Instructions		
▶ n/a	29999	0	0	in_port: 7 eth_dst: fe:d0:2d:41:ac:2c eth_src: ee:78:d1:10:20:07 eth_type: arp	output: 2		
▶ n/a	29999	1	98	in_port: 2 eth_dst: ee:78:d1:10:20:07 eth_src: 1a:65:7a:59:25:cd eth_type: ipv4	output: 7		
▶ n/a	29999	1	42	in_port: 4 eth_dst: 6a:3a:58:23:cc:7f eth_src: 26:02:c6:24:87:40 eth_type: arp	output: 2		
▶ n/a	29999	0	0	in_port: 5 eth_dst: c6:8f:a8:b7:68:cd eth_src: 22:f3:3d:22:f8:6e eth_type: arp	output: 2		
▶ n/a	29999	0	0	in_port: 2 eth_dst: 22:f3:3d:22:f8:6e eth_src: 12:71:bd:64:cc:ae eth_type: arp	output: 5		

OpenFlow has been enabled on an HP switch and is communicating with an HP VAN SDN Controller The network

administrator has checked the switch flow table entries via the controller graphical user interface, but is unsure of the format. The administrator has taken a screenshot and sent you a copy. Why does the flow table display n/a?

- A. The switch has negotiated to use OpenFlow 1.0 with the controller for this instance.
- B. The switch has negotiated to use OpenFlow 1.3 with the controller for this instance,
- C. The switch has negotiated to use standard mode with the controller for this OpenFlow instance.
- D. The switch has negotiated to use ip-control-table-mode with the controller for this OpenFlow instance.

Correct Answer: A

Table ID n/a indicates that OpenFlow 1.0 is in use. Example of the Flows View for a Specific OpenFlow Device

Flows for Data Path ID: 00:00:00:00:00:00:02						
Table ID	Priority	Packets	Bytes	Matches	Actions/Instructions	
n/a	29999	0	0	in_port: 3 eth_dst: 0e:9d:45:7c:04:ab eth_src: 3a:84:9e:66:a7:ca eth_type: arp	output: 4	
n/a	29999	1	98	in_port: 5 eth_dst: 96:a7:1b:1e:7d:d9 eth_src: ba:61:e0:9e:5f:8e eth_type: ipv4	output: 4	
n/a	29999	0	0	in_port: 5 eth_dst: 82:4b:62:3b:ed:b9 eth_src: 76:37:b7:06:d7:3d eth_type: arp	output: 6	

The "Table ID" field applies to OpenFlow 1.3 and greater, but not to OpenFlow 1.0.

Reference: HP VAN SDN Controller Administrator Guide

**QUESTION 9**

Which component synchronizes the configuration amongst a team of HP VAN SDN Controllers?

- A. Zookeeper
- B. Cassandra
- C. Virgo
- D. Keystone

Correct Answer: A

ZooKeeper is a centralized service for maintaining configuration information, naming, providing distributed synchronization, and providing group services.

Incorrect:

Not Cassandra: Apache Cassandra is an open source distributed database management system designed to handle large amounts of data across many commodity servers, providing high availability with no single point of failure.

Not Keystone: The SDN controller uses Openstack Keystone as an identity management for managing users, generating tokens, as well as token validation.

**QUESTION 10**

Refer to the exhibit.

Flows for Data Path ID: 00:0a:00:9c:02:d8:18:00							
				Summary	Ports	Flows	Groups
Table ID	Priority	Packets	Bytes	Matches	Actions/Instructions		
0	0	0	0		goto_table: 100		
100	0	157693	0		goto_table: 200		
100	29999	721	0	in_port: 4 eth_dst: 00:0c:29:24:53:3e eth_src: 00:0c:29:15:20:e6 eth_type: arp	apply_actions: output: 2		
100	29999	723	0	in_port: 2 eth_dst: 00:0c:29:15:20:e6 eth_src: 00:0c:29:24:53:3e eth_type: arp	apply_actions: output: 4		
100	29999	28740	0	in_port: 2 eth_dst: 00:0c:29:15:20:e6 eth_src: 00:0c:29:24:53:3e eth_type: ipv4	apply_actions: output: 4		
100	29999	28739	0	in_port: 4 eth_dst: 00:0c:29:24:53:3e eth_src: 00:0c:29:15:20:e6 eth_type: ipv4	apply_actions: output: 2		
200	0	154712	9982515		apply_actions: output: 4294967293		

Which version of OpenFlow has the switch shown in the exhibit with DPID 00 0a:00 9c 02:d8

18:00

negotiated to use with the HP VAN SDN Controller version 2.0?

- A.
- 1.0.0
- B.



1.3.0

C.

1.5.0

D.

1.6.0

Correct Answer: B

\*

The HP VAN controller supports the following:

Versions 1.0 and 1.3 of OpenFlow on HPN ProVision and Comware switches

\*

Openflow 1.3.1: Support for multiple flow tables is introduced

Reference: Open Flow 1.3.1 Support: Controller View

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## QUESTION 11

What is the minimum number of HP VAN SDN Controllers supported in a team?

A. One

B. Two

C. Three

D. Four

Correct Answer: C

The minimum number of team members for an HP VAN SDN Controller team is three.

Reference: HP VAN SDN Controller Installation Guide

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## QUESTION 12

A single HP VAN SDN Controller is used to control OpenFlow enabled switches that operate in virtualization mode. An internal application is installed on the controller that redirects classified traffic to a specific VLAN. The connection between the controller and the network is lost. The HP OpenFlow enabled

switches\' connection interruption mode is set to standalone mode.

What is the forwarding behavior of the OpenFlow enabled switches?

A. Based on the timeout values, the flow entries age out, and only OpenFlow traffic is discarded

- B. All flow entries are removed, and traffic is forwarded using normal switch processing.
- C. All flow entries are set not to age out, and the classified traffic is still redirected.
- D. Based on the timeout values, the flow entries are removed from the flow tables, and all traffic is discarded on the switches.

Correct Answer: B

OpenFlow instance connection interruption mode You can set the type of behavior when the switch loses connection with the controller. fail-standalone If the switch loses connection with all of the controllers, packets and messages of new flows behave as a legacy switch or router would. Existing flows of this OpenFlow instance are removed.

Reference: HP OpenFlow Switches

(page 21) [http://h20628.www2.hp.com/km-ext/kmcsdirect/emr\\_na-c03512348-4.pdf](http://h20628.www2.hp.com/km-ext/kmcsdirect/emr_na-c03512348-4.pdf)

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## QUESTION 13

What is a key advantage of implementing malware protection by using the HP Network Protector SDN application?

- A. To provide central management of antivirus software
- B. To provide rule-based access control
- C. To provide VLAN assignment without supplicant
- D. To provide clientless operation

Correct Answer: B

About VLAN group policies Policies are a collection of filters or rules that provide a method for setting up security configuration options for VLAN groups. You can create customized policies for each VLAN group based on the requirements and the threat type for each group.

You can customize the policies for the groups by setting the reputation scores. You can set up policies for each group to protect your network from the following threat types: Botnet, Malware, etc

Reference: HP Network Protector SDN Application Administrator Guide

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## QUESTION 14

A switch connects to the HP VAN SDN Controller, which has the HP Network Protector SDN Application installed. These are the switch details:

Switch: 3800-24G-2XG Firmware: KA15.14.003

OpenFlow negotiated: 1.3

Which channel will be used for communication with the HP Network Protector application?

- A. OpenFlow Channel

- B. Normal Forwarding
- C. Service Insertion Tunnel
- D. GRE Tunnel

Correct Answer: A

The application uses the switch firmware information to decide if the communication with the switch is through OpenFlow channel or through the application Insertion tunnel. For firmware versions K.15.14 and lower, the application communicates with the switch through OpenFlow channel. For firmware versions KA.15.15.0015 and greater, the application can communicate with the switch either through OpenFlow channel or Service Insertion tunnels.

Reference: HP Network Protector SDN Application Administrator Guide

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## QUESTION 15

Which framework allows for dynamic insertion and removal of applications in an HP VAN SDN Controller?

- A. cURL
- B. JSON
- C. OSI
- D. OSGi

Correct Answer: D

OSGi was thus selected to allow elasticity of applications. The applications can be dynamically introduced and dynamically removed from a running environment without having to shut down the whole controller and then restart it. Using a network analogy again, the applications are "hot-swappable".

Reference: HP Virtual Application Networks SDN Controller Technical Solution Guide <http://www8.hp.com/h20195/v2/GetPDF.aspx%2Fc04219919.pdf> (page 11 and 12)

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