HP2-Z31 Q&As

Creating HP Software-defined Networks

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QUESTION 1

Which table functionality was introduced with OpenFlow 1.3?

A. ARP

B. Metering

C. Flow

D. Matching

Correct Answer: B

OpenFlow version 1.3 is the latest version of OpenFlow that has support from switch vendors. It is significantly different from OpenFlow version 1.0 (which was the previous version several vendors supported). Among others, the main features added since then are:

1.1: Support for MPLS, Q-in-Q, VLANs, multipath, multiple tables, logical ports 1.2: Support for extensible headers (in match, packet_in, set_field), IPv6 1.3: Support for tunneling, per-flow traffic meters, Provider Backbone Bridging

Reference: OpenFlow version 1.3 tutorial

QUESTION 2

What is one benefit of a software-defined networking (SDN) solution for a WAN?

A. SDN applications can automatically deploy key services on branch zl or MSR modules in case of a failed WAN connection.

B. SDN applications provide a remote connection to servers so that remote IT staff can identify and resolve issues.

C. SDN applications provide a graphical interface for scripting CLI commands for multiple branches at once.

D. SDN applications can adjust WAN bandwidth provisioning granularly, dynamically, and intelligently.

Correct Answer: D

Software-defined networking (SDN) is an architecture purporting to be dynamic, manageable, cost-

effective, and adaptable, seeking to be suitable for the high-bandwidth, dynamic nature of today\\'s

applications.

The SDN architecture is:

Directly programmable: Network control is directly programmable because it is decoupled from forwarding

functions.

Agile: Abstracting control from forwarding lets administrators dynamically adjust network-wide traffic flow to

meet changing needs.

Reference: Wikipedia, Software-defined networking

QUESTION 3

HP IMC provides comprehensive Fault Configuration, Accounting. Performance and Security functionality. Which functionality does the HP IMC SDN Manager provide? (Select three.)

A. Accounting

B. Reporting

C. Performance

D. Fault

E. Configuration

Correct Answer: ACE

A, B, C IMC VAN SDN Manager will feature full-fault, configuration, accounting, performance and security management for HP enabled SDN domains.. · Enable deployment, monitoring and management of HP OpenFlow enabled switches

*

Visualize traffic flow and performance monitoring in HP SDN Domains

*

Backup and restore configurations and software of HP SDN Controllers · Provide graphical OpenFlow troubleshooting with path analysis

Reference: HP IMC Virtual Application Networks Modules

QUESTION 4

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 ptcp:6633

Then use dpctl. Examples:

dpctl dump-tables tcp::

dpctl dump-flows tcp::

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

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.

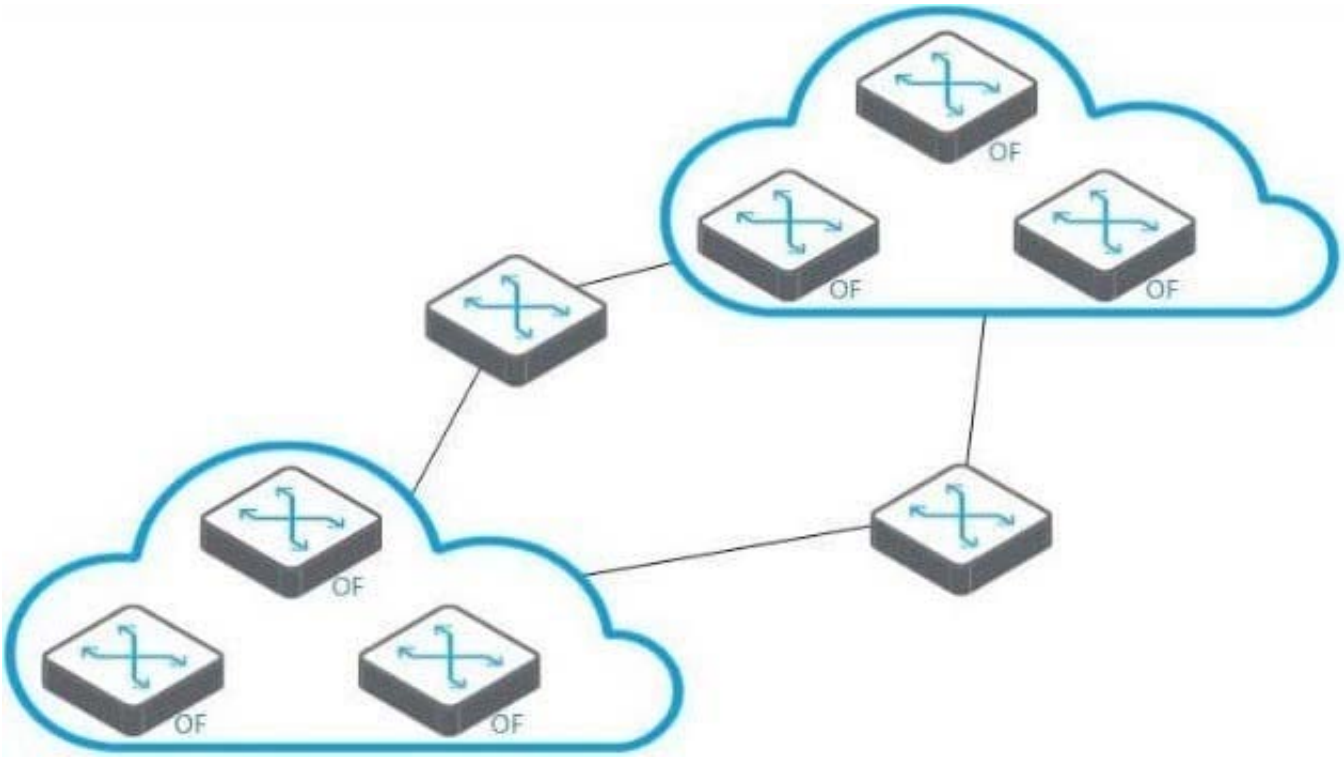
Q: What is the HP Virtual Application Networks SDN Controller?

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

QUESTION 6

Refer to the exhibit.



The topology shown in the exhibit has the following characteristics:

*

The Open Flow enabled switches are running in virtualization mode with member VLAN 10

*

All the switches in the topology share the same VLANs.

*

All the VLANs are tagged on all the links.

*

Each OpenFlow domain is controlled by its own controller and is making independent decisions

*

Every switch within the topology has PVST enabled only on VLAN 10

The networking team implementing OpenFlow reports that there are communication problems between the OpenFlow domains. What could be the cause of this communication problem?

A. This is an unsupported topology.

B. OpenFlow requires a dedicated out-of-band management network

C. OpenFlow networks that communicate must use different VLANs.

D. A loop has been formed.

Correct Answer: A

Virtualization mode With Virtualization Mode, some VLANs can be designated as members of OpenFlow instances. Each OpenFlow instance is independent and has its own OpenFlow configuratio

Note: OpenFlow can be configured for Virtualization Mode or Aggregation Mode.

*

Virtualization Mode Each OpenFlow instance is independent and has its own OpenFlow configuration and OpenFlow controller connection. Some VLANs are designated as members of OpenFlow instances while other VLANs are not. The VLANs that are not members of OpenFlow instances could be thought of as VLANs carrying production traffic.

*

Aggregation Mode Provides a single OpenFlow instance that includes all of the VLANs configured on the switch except the VLAN(s) that connect to the controller(s) and the Management VLAN on the switch. Production traffic is not allowed

Reference: HP OpenFlow Switches Administrator\\'s Guide

QUESTION 7

Which HP IMC SDN Manager functionality provides a logical overview of the OpenFlow network?

A. SDN Manager reports

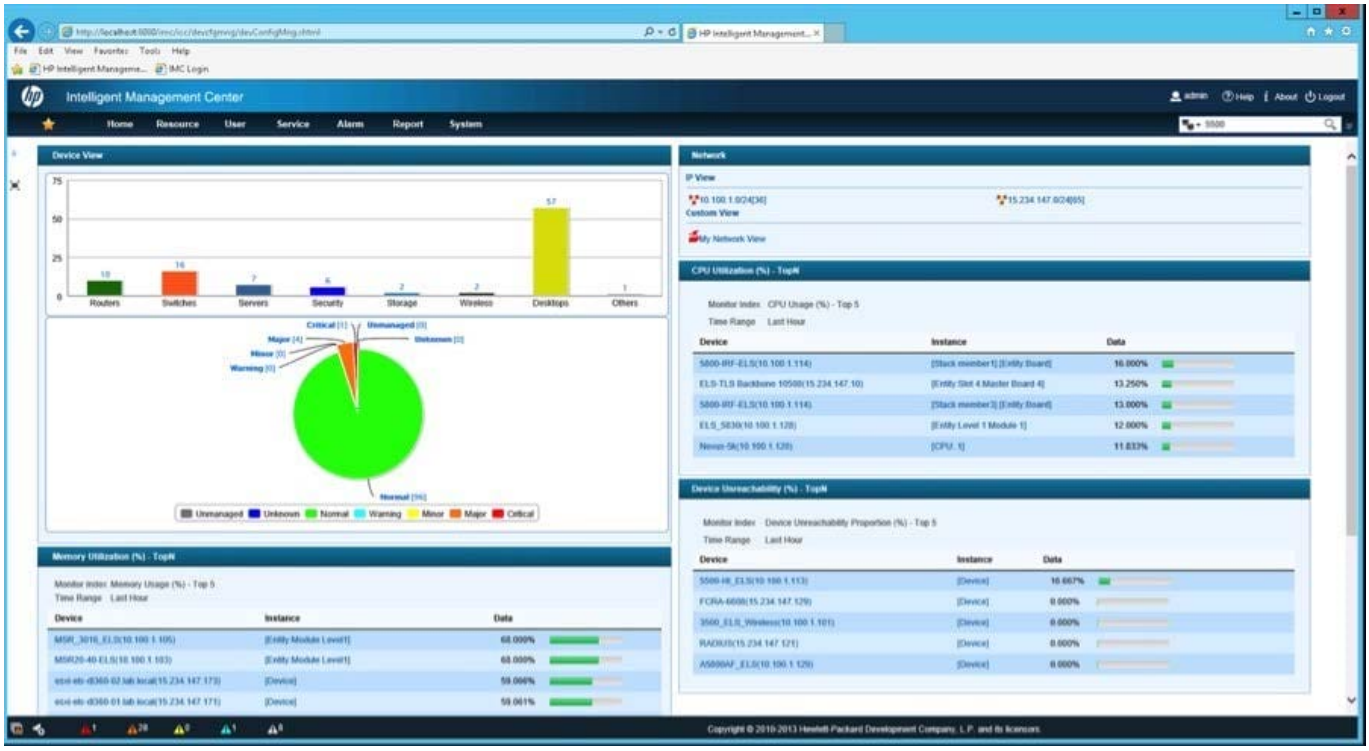
B. SDN Manager dashboard

C. SDN Manager flow entry management

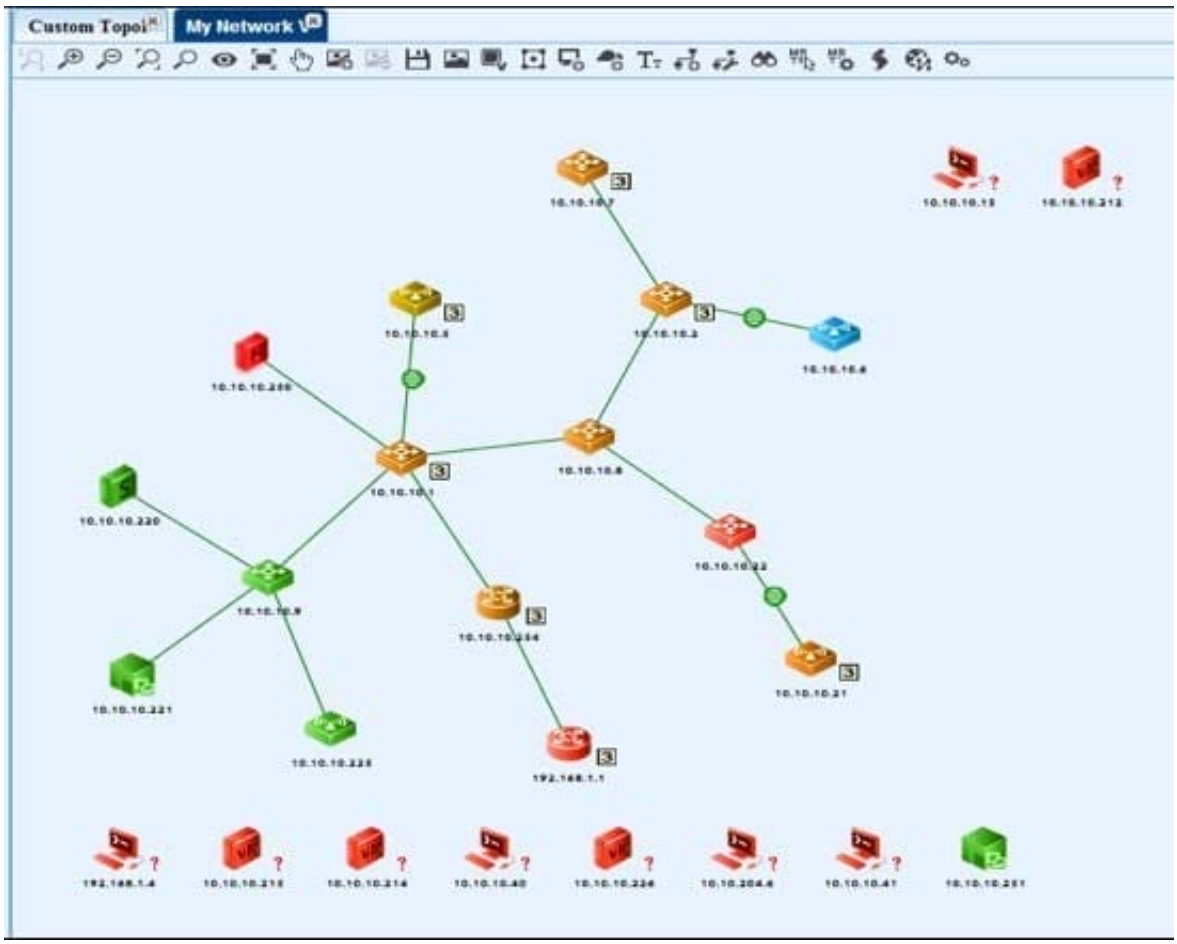
D. SDN Manager OpenFlow topology

Correct Answer: B

HP IMC Dashboard figure:



My Network view (within SDN Manager Dashboard):



Reference: Review: HP Intelligent Management Center (IMC)

QUESTION 8

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

QUESTION 9

A multicast application is used in a customer\\'s environment that relies on IGMP. On an edge switch an Openflow 1.3 instance is configured in aggregation mode. By default, what happens to the IGMP traffic if no matching flow entry

exists?

A. IGMP traffic is forwarded on the data plane.

B. IGMP traffic is forwarded to the SON Controller.

C. IGMP traffic is dropped.

D. IGMP traffic is forwarded on the control plane.

Correct Answer: C

In Aggregation mode, all VLANs in the switch are part of an OpenFlow instance. When Aggregation is configured, there is only OpenFlow traffic, no production traffic.

Reference: HP OpenFlow 1.3 Administrator Guide, Wired Switches K/KA/KB/WB 15.15

QUESTION 10

Which protocol is used for link discovery when OpenFlow switches are separated by a non- OpenFlow switch?

A. BDDP

B. RSTP

C. LLDP

D. LACP

Correct Answer: A

LLDP is used to discover direct links between switches and BDDP is used to discover the switches in the same broadcast domain.

Note: Using a link-discovery module, the controller generates both LLDP and broadcast packets (referred to as BDDPs) and sends them to all neighboring switches on a regular basis.

Reference: OpenFlow Controller

QUESTION 11

Which switches will initiate an QpenFlow connection to the HP VAN SDN Controller? (Select two.)

A ☐

```
openflow instance 1
 description vlan10
 controller 1 address ip 192.168.56.7
 activate instance
```

B ☐

```
openflow instance 1
 description vlan10
 classification vlan 10
 activate instance
```

C ☐

```
configure
 openflow
   controller-id 1 ip 192.168.56.7 controller-interface vlan 192
   instance "vlan10"
      member vlan 10
      controller-id 1
      enable
     exit
   enable
   exit
```

D ☐

```
openflow instance 1
 classification vlan 10
 controller 1 address ip 192.168.56.7
 activate instance
```

E ☐

```
configure
 openflow
   controller-id 1 ip 192.168.56.7 controller-interface vlan 192
   instance "vlan10"
      member vlan 10
      controller-id 1
      version 1.3
     exit
   enable
   exit
```

A. Option A

B. Option B

C. Option C

D. Option D

E. Option E

Correct Answer: CE

You must enable openflow.

Enable/disable Openflow:

openflow {enable/disable}

Note:

Openflow Configuration (required)

Once you\\'ve set up a VLAN, you need to enable and configure an OpenFlow instance on that VLAN.

Show the set of configured OpenFlow instances:

show openflow

Enter the VLAN for the instance you\\'d like to configure:

vlan

Show the Openflow configuration, including configurable state, controller connectivity, and switch MAC

addr:

show openflow

Set the controller string (6633 is NOX\\'s default port):

openflow controller tcp:: Enable/disable Openflow:

openflow {enable/disable}

Reference: Configuring HP Procurve

http://archive.openflow.org/wk/index.php/Configuring_HP_Procurve

QUESTION 12

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 13

Which HP IMC SDN Manager functionally provides a detailed overview of flow entry history?

A. SDN Manager service flow management

B. SDN Manager Open Flow device management

C. SDN Manager dashboard

D. SDN Manager flow entry management

Correct Answer: A

Flow Management:

*

Delivers History Flow Entry records flow entry used before to help administrators audit flow policy change

*

Displays the list of all current Flow entry in OF network, including Match Field, Instruction and other statistics.

*

Shows detailed flow service information and flow traffic and trend in flow entry detail page

*

Provides shortcut to locate flow to topology show device and link status

Reference: HP IMC Virtual Application Networks Software-defined Networking Manager Software

QUESTION 14

Refer to the exhibits.

```
<5900-2>dis openflow instance 10
Instance 10 information:

Configuration information:
 Description   : vlan10
 Active status : active
 Inactive configuration:
  none
 Active configuration:
  Classification VLAN, total VLANs(1)
   10
  In-band management VLAN, total VLANs(0)
   empty VLAN
  Connect mode: multiple
  MAC address learning: Enabled
  Flow table:
```

```
   Table ID(type): 0(Extensibility), count: 0
  Flow-entry max-limit: 65535
  Datapath ID: 0x000a44319261869e
Port information:
 GigabitEthernet1/0/2
 GigabitEthernet1/0/4
 GigabitEthernet1/0/5
 GigabitEthernet1/0/7
 GigabitEthernet1/0/8
Active channel information:
 Failopen mode: secure

<5900-2>
```

```
[5900-2]display openflow instance 10 controller
Instance 10 controller information:
 Reconnect interval: 60 (s)
 Echo interval     : 5  (s)

 Controller ID           : 1
 Controller IP address   : 192.168.56.7
 Controller port         : 6633
 Controller role         : Equal
 Connect type            : TCP
 Connect state           : Established
 Packets sent            : 440
 Packets received        : 888
 SSL policy              : --
 VRF name                : --

[5900-2]
```

What happens when the switch shown in the exhibit loses connectivity to the HP VAN SDN Controller?

A. The switch removes all flow entries and reverts to the normal forwarding process,

B. The switch removes all flow entries and continues to use the OpenFlow pipeline.

C. The switch forwards traffic based on flow tables and does not delete unexpired flow entries.

D. The switch uses the normal forwarding process and does not delete the flow entries.

Correct Answer: C

QUESTION 15

How is a leader elected in an HP VAN SDN Controller team by default?

A. by the lowest IP address value

B. by the lowest priority value

C. by the highest priority value

D. by the highest IP address value

Correct Answer: C

Once a team is configured, the configuration and monitoring of team members and their associated OpenFlow switches is performed by the team manager. If the team manager goes down, the controller with the next highest priority in the team configuration becomes the team manager. Note: Team Management Each controller belonging to a team is a team member. To centralize team management and control, one controller is designated as the team manager. Teaming is configured on one controller and is automatically propagated to the other controllers in the team, regardless of which controller becomes the team manager.

Reference: HP VAN SDN Controller Administrator Guide