



2 marks

Software Defined Networks (Anna University)



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QUESTION BANK

UNIT 1

Q.1 What is software-defined networking ?

☞ **Ans.** : Software-Defined Networking (SDN) is an architecture designed to make a network more flexible and easier to manage. SDN centralizes management by abstracting the control plane from the data forwarding function in the discrete networking devices.

Q.2 What is control plane ?

☞ **Ans.** : Control plane is a component for network in SDN which it can carry traffics and it can focus on how individual package will interacts with its neighbours during state exchange.

Q.3 What is SDN device ?

☞ **Ans.** : An SDN device is composed of an API for communication with the controller, an abstraction layer and a packet-processing function.

Q.4 What is south-bound interface ?

☞ **Ans.** : The southbound interface is a collection of drivers that handles communication to all data-plane elements in the network.

Q.5 What is northbound interface ?

☞ **Ans.** : A northbound interface is an interface that allows a particular component of a network to communicate with a higher-level component.

Q.6 Define data plane.

☞ **Ans.** : Data plane refers to the tasks that a networking device does to forward a message.

The data plane handles incoming datagrams through a series of link-level operations that collect the datagram and perform basic checks.

Q.7 List the components of SDN.

☞ **Ans.** : SDN components are : Data plane, control plan, soundbound interface, northbound interface and application plane.

Q.8 List the functions of control plane.

☞ **Ans.** : Control plane functions are :

- (a) Topology discovery and maintenance
- (b) Packet route selection and instantiation
- (c) Path failover mechanism

Q.9 What is network device ?

☞ **Ans.** : A network device is an entity that receives packets on its ports and performs one

or more network functions on them. Network devices can be implemented in hardware or software and can be either a physical or virtual network element.

UNIT 2

Q.1 What is SDN controller ?

☞ **Ans. :** An SDN controller is an application in a software-defined networking architecture that manages flow control for improved network management and application performance.

Q.2 Define overlay networking.

☞ **Ans. :** Overlay networking is a method of using software to create layers of network abstraction that can be used to run multiple separate, discrete virtualized network layers on top of the physical network, often providing new applications or security benefits.

Q.3 What is logical ports ?

☞ **Ans. :** Logical ports are switch-defined ports that do not correspond directly to hardware interfaces on the switch.

Q.4 What is asynchronous communication ?

☞ **Ans. :** Asynchronous communication is initiated by the OpenFlow-compliant switch without any solicitation from the controller. It is used to inform the controller about packet arrivals, state changes at the switch and errors.

Q.5 Define OpenFlow.

☞ **Ans. :** OpenFlow is a control protocol. It is used to communicate policies and traffic management information between a controller and a switch.

Q.6 Explain proactive rules.

☞ **Ans. :** Proactive rules are relatively static, controller places rules in switch before they are required. The controller can populate the flow tables ahead of time, similar to typical routing. By pre-defining all of your flows and actions ahead of time in the switches flow tables, the packet-in event never occurs. The result is all packets forwarded at line rate.

Q.7 Explain reactive rules.

☞ **Ans. :** Reactive rules are dynamic. Packets which have no match are sent to the controller (packet in). Controller creates appropriate rule and sends packet back to switch (packet out) for processing. The problem with this approach is that there can many CPU hits.

Q.8 What is use of SDN API ?

☞ **Ans. :** SDN Application Program Interfaces (APIs) provide both open and proprietary communication between the SDN controller and the routers of the network.

UNIT-3

Q.1 What is data center ?

☞ **Ans. :** A data center is any location, accessible by members of an enterprise, that houses collected hardware and ancillary devices that can run internal networks, host digital systems and applications, or store data.

Q.2 List core elements of data center.

☞ **Ans. :** Data center uses five core elements for processing. These elements are application, database, network, storage array, operating system and server.

Q.3 What is virtualization ?

☞ **Ans. :** Virtualization is an abstraction layer that decouples the physical hardware from the operating system to deliver greater IT resource utilization and flexibility. It allows multiple virtual machines, with heterogeneous operating systems to run in isolation, side-by-side on the same physical machine. Virtualization means running multiple machines on a single hardware.

Q.4 What is key capabilities of NVGRE ?

☞ **Ans. :** Key capabilities of the NVGRE standard include identifying a 24-bit Tenant Network Identifier (TNI) to address problems associated with the multi - tenant network

Q.5 List functions supported by data centers.

☞ **Ans. :** Data centers support the following things :

1. Processing of users business transactions
2. Hosting of company website
3. Process and store intellectual property
4. Maintain financial records
5. Route electronic mails.

Q.6 What is VLAN ?

☞ **Ans. :** A VLAN is a switched network that is logically segmented on an organizational basis, by function, project teams or applications rather than on a physical or geographical basis.

Q.7 What is VxLAN ?

☞ **Ans. :** VxLAN is an encapsulation protocol that provides data center connectivity using tunneling to stretch Layer 2 connections over an underlying Layer 3 network.\

Q.8 Explain EVPN.

☞ **Ans. :** An Ethernet VPN (EVPN) enables you to connect dispersed customer sites using a Layer 2 virtual bridge. EVPN augments the data plane MAC learning paradigm with a control plane solution for automated MAC learning between data centers. EVPN creates a new address family for BGP by converting MAC addresses into routable addresses and then uses this to distribute MAC learning information between PEs in the network.

Q.9 What is data center orchestration ?

☞ **Ans. :** Data center orchestration is a process-driven workflow that helps make data centers more efficient. Repetitive, slow and error-prone manual tasks are replaced by the automation of tasks and the orchestration of processes.

Q.10 List the functions of data center orchestration.

- ☞ **Ans. :**
1. Scheduling and coordination of data services.
 2. Leveraging of distributed data repository for large data sets.
 3. Tracking and publishing APIs for automatic updates of metadata management.
 4. Updating policy enforcement and providing alerts for corrupted data.
 5. Integrating data services with cloud services.

UNIT 4

Q.1 What is Network Functions Virtualization ?

☞ **Ans. :** Network Functions Virtualization (NFV) abstracts network functions, allowing them to be installed, controlled and manipulated by software running on standardized compute nodes. NFV incorporates cloud and virtualization technologies to drive rapid development of new network services with elastic scale and automation. These technologies are often grouped as NFV and SDN.

Q.2 What is Frenetic ?

☞ **Ans. :** Frenetic is a domain-specific language for programming OpenFlow networks.

This domain-specific programming language allows network operators, rather than manually configuring each connected network device, to program the network as a whole.

Q.3 What is Northbound API ?

☞ **Ans. :** Northbound API presents a network abstraction interface to the applications and the management systems at the top of the SDN stack.

Q.4 Explain Management Interface.

☞ **Ans. :** Management interfaces allow network operators to manage network devices in their networks. These interfaces generally provide the operator with a consistent operational view of a device, including its configuration and operational status.

Q.5 What do you mean network Orchestration ?

☞ **Ans. :** Network Orchestration, also known as Software-defined networking Orchestration is the process of automatically programming the behavior of the network, so that the network smoothly coordinates with the hardware and the software elements to further support applications and services.

Q.6 What are the difference between automation and orchestration ?

☞ **Ans. :** Automation refers to a single task, orchestration arranges tasks to optimize a Workflow

Q.7 What are the goals of NFV ?

☞ **Ans. :** NFV goals are to define requirements, identify best practices, identify gaps in current standards and make recommendations on how to fill those gaps. NFV has a main organizational body, a Technical Steering Committee (TSC) and several subgroups with specific areas of focus.

Q.8 What are functions of management and Orchestration ?

☞ **Ans. :** Management and Orchestration (MANO) defines a framework that can be used for the provisioning, configuration and operation of virtualized network functions essentially defining an orchestrator that controls all the VNFs.

Q.9 What is Data Plane Development Kit (DPDK) ?

☞ **Ans. :** DPDK is open source software that provides libraries and drivers for fast packet processing. It allows an application to bypass the kernel and Linux network stack and

directly access packets on the NIC.

Q.10 Explain Representational State Transfer APIs.

☞ **Ans. :** Representational State Transfer (REST) Application Programming Interfaces (APIs) enable you to securely connect to systems, execute remote procedure calls (RPCs) and use a variety of formatting and display options, including JavaScript Object Notation (JSON).

UNIT 5

Q.1 what is data center orchestration?

☞ **Ans. :** Data center orchestration is a process-driven workflow that helps make data centers more efficient. Repetitive, slow and error-prone manual tasks are replaced by the automation of tasks and the orchestration of processes

Q.2 Explain bandwidth calendaring.

☞ **Ans.:** Bandwidth calendaring allows network operators to reserve resources upfront or for a dedicated period of time. It enables highly accurate usage-based charging for bandwidth. Reduces the need for on-site configuration at customer premises, for example when upgrading bandwidth.

Q.3 what is service abstraction layer?

☞ **Ans.:** A Service Abstraction Layer (SAL) maps both internal and external service requests to the appropriate southbound plug-in and provides basic service abstractions that higher-level services are built upon, depending on the capabilities of the plug-in(s).

Q.4 Explain about Juniper network.

☞ **Ans. :** • Juniper Networks is an open-source software-defined networking solution that automates and orchestrates the creation of highly scalable virtual networks.
• Juniper Networks demonstrated a Java-based framework with a RESTful API that served as a rapid prototyping environment to aid in the development of new and useful network applications

Q.5 What is Qfabric ?

☞ **Ans. :** Juniper Networks produces switches using a proprietary multipath Layer 2/3 architecture and encapsulation protocol called Qfabric. It allows multiple distributed physical devices in the network to share a common control plane and a separate, common management plane, thereby behaving as if they were a single large switch entity.

Q.6 Explain about Floodlight.

☞ **Ans. :** Floodlight is based on Beacon from Stanford University. Floodlight is an Apache licensed, Java-based OpenFlow controller.