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Exam Code: JN0-223

Exam Name: Automation and DevOps, Associate

Exam A

QUESTION 1
Junos automation provides several methods for device provisioning, including through the console port.

A. The Junos REST API client is on-box.
B. Junos automation does not allow for device provisioning throuqh the console port.
C. Junos automation allows for device provisioning through the console port.
D. The Junos REST API client is off-box.

Correct Answer: C
Section:
Explanation:
Junos automation provides several methods for device provisioning, including through the console port. This allows network administrators to automate the initial configuration of devices even before they are connected to the network. This method is particularly useful for scenarios where remote devices need to be provisioned before they are fully integrated into the network.
Option A (The Junos REST API client is on-box) and Option D (The Junos REST API client is off-box) describe the REST API client's location but do not address device provisioning through the console port.
Option B (Junos automation does not allow for device provisioning through the console port) is incorrect because Junos automation does support such provisioning.
Supporting
Reference:
Juniper Networks Automation and Provisioning Documentation: This documentation includes examples and instructions for provisioning devices through various methods, including the console port.

QUESTION 2
Which two statements are correct about using the Junos REST API? (Choose two.)

A. It supports data In CSV format.
B. It must use SSH for a connection.
C. NETCONF is not supported.
D. It is a simple configuration.

Correct Answer: B, D
Section:
Explanation:
The Junos REST API provides a simple configuration method for interacting with Junos devices programmatically. It requires an SSH connection for secure communication between the client and the Junos device.
Option B is correct because the Junos REST API relies on SSH for secure connections.
Option D is correct as the Junos REST API is designed to be easy to configure and use, allowing for straightforward interaction with Junos devices.
Option A (It supports data in CSV format) is incorrect; the REST API typically uses JSON or XML for data exchange.
Option C (NETCONF is not supported) is incorrect as Junos REST API can work alongside NETCONF.
Supporting
Reference:
Juniper Networks REST API Documentation: This provides details on how the REST API interacts with Junos devices, including the necessity of SSH and the simplicity of its configuration.

QUESTION 3
What is the correct Python script syntax to prompt for input?

A. hostIP = input('Device IP address: ')

B. hostIP = input{Device IP address: }
C. hostIP = input'Device IP address: '
D. input('Device IP address: ') = hostIP

Correct Answer: A
Section:
Explanation:
In Python, the correct syntax to prompt the user for input and store that input in a variable is:
input(prompt): The input() function is used to take input from the user. The string provided as an argument (inside the parentheses) is displayed as a prompt to the user. The input provided by the user is returned as a string and can be stored in a variable.
Example:
hostIP = input('Device IP address: ')
In this example, 'Device IP address: ' is the prompt displayed to the user, and the user's input will be stored in the variable hostIP.
Options B, C, and D are syntactically incorrect in Python.
Python Official Documentation: Describes the use of the input() function for getting user input.
Python Tutorials: Various tutorials demonstrate how to properly use the input() function in scripts.

QUESTION 4
Given the following Python script:
a = [1,2,3,4,5,6,7,8,9]
print(a[0])
What is the output of this print command?

A. 1
B. 2
C. 7
D. 9

Correct Answer: A
Section:
Explanation:
In Python, lists are zero-indexed, meaning the first element of the list is at index 0. The given script is:
pythona = [1, 2, 3, 4, 5, 6, 7, 8, 9]
print(a[0])
a[0] refers to the first element in the list a, which is 1.
So, the output of the print(a[0]) command is 1.
Option A is correct because Python indexing starts at 0, making the first element of the list at index 0.
Python Official Documentation: Covers list indexing and operations.
Python Programming Tutorials: Provide examples of list indexing.

QUESTION 5
Which Junos API supports direct modification of the Ephemeral database?

A. JET
B. WebSocket
C. SOAP
D. REST

Correct Answer: A
Section:
Explanation:
In Junos, the JET (Junos Extension Toolkit) API supports direct modification of the Ephemeral database. The Ephemeral database is a temporary configuration database used in Junos OS, allowing for changes that do not persist after a reboot unless explicitly committed to the permanent configuration.
JET API: Allows for high-performance interactions with Junos, including the ability to make changes to the Ephemeral database, which is useful for temporary configurations, dynamic policies, and other operational tasks.
Other options like WebSocket, SOAP, and REST do not provide direct access to the Ephemeral database in Junos.
Juniper Networks JET Documentation: Details how JET API interacts with the Ephemeral database.
Junos Automation and DevOps Documentation: Discusses the use of JET for automation and dynamic configuration.

QUESTION 6
Junos supports which two APIs for on-box scripting? (Choose two.)

A. JET
B. Puppet
C. XML
D. Chef

Correct Answer: A, C
Section:
Explanation:
Juniper Networks' Junos operating system supports several APIs for on-box scripting, two of which are:
JET (Juniper Extension Toolkit): JET is a modern API framework that provides a programmable interface for interacting with Junos. It allows developers to create custom applications that run directly on Junos devices, enabling the automation of network operations. JET provides both a gRPC and a REST API interface, allowing for flexible integration with external systems.
XML API: The Junos XML API allows direct interaction with the Junos OS through XML-based requests. This API can be used to retrieve information, configure devices, and execute commands on Junos devices. The XML API is crucial for automation tasks as it provides a structured and consistent way to interact with the device's configuration and operational data.
Detailed Explanation:
JET (A) provides high-performance access to Junos routing, switching, and service elements via programmable interfaces. It is highly used for creating custom applications that require tight integration with the Junos OS.
XML (C), on the other hand, is a well-established method for interacting with Junos, especially for legacy systems or when working within environments where XML is the standard data format.
Other options like Puppet (B) and Chef (D) are not APIs provided by Junos for on-box scripting but are configuration management tools used externally to manage Junos devices.
Juniper Networks JET Documentation: Provides details on how to leverage JET APIs for automation.
Junos XML Management Protocol Guide: Describes how to use XML for scripting and automating tasks in Junos.
These APIs are key components of Juniper's automation strategy, allowing for scalable, flexible, and efficient network operations.

QUESTION 7
Which two statements about NETCONF layers are correct? (Choose two.)

A. NETCONF layers use the messages layer to receive RPCs from a remote NETCONF server.
B. NETCONF layers use the messages layer to send RPCs to a remote NETCONF server.
C. NETCONF layers use the operations layer to receive RPCs from a remote NETCONF server.
D. NETCONF layers use the operations layer to send RPCs to a remote NETCONF server.

Correct Answer: B, C
Section:
Explanation:
NETCONF (Network Configuration Protocol) is a standard protocol defined for managing network devices. NETCONF operates in a layered architecture, which includes the following key layers:
Operations Layer: This layer deals with the actual operations like <get-config>, <edit-config>, <copy-config>, and others. It receives RPC (Remote Procedure Call) requests from a remote NETCONF client and processes these requests.
Messages Layer: This layer is responsible for encoding the RPCs and sending them over the network. It handles the communication between the NETCONF client and server, ensuring that the RPC messages are correctly

formatted (usually in XML) and transmitted.
Statement B is correct because the Messages layer is responsible for sending RPCs to a remote NETCONF server.
Statement C is correct because the Operations layer is where the NETCONF server receives and processes the RPCs sent by the client.
Supporting
Reference:
Juniper Networks NETCONF Documentation: Provides a detailed breakdown of the NETCONF protocol layers and their functions.
RFC 6241: The official specification for NETCONF, which describes the layered architecture, including the operations and messages layers.

QUESTION 8
Which two tools would you use to make REST API requests? (Choose two.)

A. cURL
B. NETCOfJF
C. Web browser
D. SSH

Correct Answer: A, C
Section:
Explanation:
REST API requests can be made using various tools that support HTTP methods. Two common tools are:
cURL: A command-line tool that allows you to send HTTP requests, including GET, POST, PUT, and DELETE. It is widely used for testing and interacting with RESTful APIs due to its simplicity and flexibility.
Web Browser: Modern web browsers can be used to send HTTP GET requests directly by entering the URL into the address bar. Additionally, browser extensions like Postman or built-in developer tools can be used to construct and send more complex REST API requests.
Option B (NETCOfJF) is incorrect as it does not refer to a standard tool for making REST API requests.
Option D (SSH) is incorrect because SSH is a protocol used for secure remote login and command execution, not for sending REST API requests.
Supporting
Reference:
cURL Documentation: Official cURL documentation provides extensive information on how to use cURL to interact with REST APIs.
Web Development and REST API Guides: Many web development resources and REST API documentation recommend using web browsers and tools like cURL for testing and interacting with APIs.

QUESTION 9
Which DevOps 'Three way' principle addresses technical debt?

A. feedback
B. flow
C. continuous experimentation and learning
D. continuous experimentation

Correct Answer: B
Section:
Explanation:
The 'Three Ways' in DevOps represent key principles for achieving continuous delivery and improvement. They are:
Flow (First Way): This principle focuses on creating a fast flow of work from development to operations, reducing delays, and minimizing handoffs. It addresses technical debt by emphasizing the importance of reducing complexity, minimizing work-in-progress (WIP), and ensuring that code and infrastructure are simple and maintainable.
Feedback (Second Way): This involves creating a feedback loop that allows teams to detect and correct issues quickly.
Continuous Experimentation and Learning (Third Way): Encourages a culture of continuous experimentation, learning from failures, and innovation.
The Flow principle specifically addresses technical debt by promoting practices that prevent the accumulation of unnecessary complexity and encouraging early detection and resolution of problems, thus ensuring that the codebase and infrastructure remain maintainable and scalable.
Supporting

Reference:
'The Phoenix Project' by Gene Kim, Kevin Behr, and George Spafford: A foundational text in DevOps literature, explaining the Three Ways and how they relate to improving IT and software development processes.
'The DevOps Handbook' by Gene Kim et al.: Expands on the Three Ways, particularly the importance of flow in preventing technical debt and ensuring a smooth deployment pipeline.

QUESTION 10
Which two processes are used by Junos automation? (Choose two.)

A. mod
B. jsd
C. ifd
D. kmd

Correct Answer: B, C
Section:
Explanation:
In Junos OS, automation processes are integral to the system's ability to manage network operations efficiently. The following processes are used by Junos automation:
jsd (Junos XML API Server Daemon): This process is crucial for handling XML API requests, which are essential for automation tasks. The jsd process manages interactions between the Junos XML API and the Junos OS, enabling automation scripts to query and configure network devices using XML-formatted commands.
ifd (Interface Daemon): While ifd is primarily responsible for managing network interfaces, it is involved in automation through its role in the operational state of the network. Automation scripts often need to interact with network interfaces to retrieve status information or modify configurations, making ifd a critical component.
Other options like mod and kmd are not directly related to the primary automation processes in Junos OS. mod is related to chassis management, and kmd handles security services.
Juniper Networks Automation and DevOps Documentation: Provides detailed descriptions of processes like jsd and ifd and their roles in Junos OS.
Junos OS Daemons Documentation: Outlines the purpose and functionality of various daemons, including jsd and ifd.

QUESTION 11
Which two statements are valid regarding Junos automation? (Choose two.)

A. The jsd process handles XML API calls.
B. The mgd process handles JET API requests.
C. The jsd process handles JET API requests.
D. The mod process handles XML API calls.

Correct Answer: A, C
Section:
Explanation:
In Junos automation, several processes handle API requests, and understanding which process handles what is crucial:
jsd Process:
XML API Calls (A): The jsd process is responsible for handling XML API calls, which are a significant part of Junos automation. XML API allows for structured and standardized communication with Junos devices, enabling automation scripts to query and configure devices.
JET API Requests (C): The jsd process also handles JET (Junos Extension Toolkit) API requests. JET provides a more modern, programmable interface for interacting with Junos OS, and jsd is the process that manages these interactions.
mgd Process (Incorrect Option):
Not for JET API Requests: The mgd process handles general management operations, such as CLI commands and managing the configuration database, but it does not handle JET API requests. That role is fulfilled by jsd.
mod Process (Incorrect Option):
Not for XML API Calls: The mod process deals with managing chassis components and is not involved in handling XML API calls.
Juniper Networks JET and XML API Documentation: Describes the roles of jsd in handling both XML and JET API requests.
Junos Automation and DevOps Documentation: Provides insights into how different processes interact with Junos APIs.

QUESTION 12

Tuples are defined using parentheses ()

A. Lists are immutable objects that use square brackets, and tuples are mutable objects that use parentheses.
B. Lists are mutable objects that use square brackets, and tuples are immutable objects that use parentheses.
C. Lists are immutable objects that use parentheses, and tuples are immutable objects that use square brackets.
D. Lists are mutable objects that use parentheses, and tuples are immutable objects that use square brackets.

Correct Answer: B
Section:
Explanation:
In Python, the distinction between lists and tuples is essential for efficient programming:
Lists:
Mutable (B): This means that once a list is created, its elements can be changed, added, or removed. Lists are versatile and commonly used when the data is expected to change.
Square Brackets: Lists are defined using square brackets [].
Example:
my_list = [1, 2, 3]
my_list[0] = 10 # Modifying the first element
Tuples:
Immutable (B): Once a tuple is created, it cannot be altered. Tuples are used when a fixed collection of items is needed, providing more integrity to the data.
Parentheses: Tuples are defined using parentheses ().
Example:
my_tuple = (1, 2, 3)
# my_tuple[0] = 10 # This would raise an error because tuples are immutable
Python Official Documentation: The Python Language Reference provides detailed information on data types like lists and tuples, including their mutability and syntax.
Automation Scripts: In the context of automation, understanding when to use mutable or immutable data structures can significantly impact script performance and reliability.

QUESTION 13
You want to use a Python package or module.
In this scenario, which statement would accomplish this task?

A. reap
B. dir
C. input
D. Import

Correct Answer: D
Section:
Explanation:
In Python, to use a package or module, you use the import statement. This statement allows you to load a module into your script so that you can use its functions, classes, and variables. For example, if you wanted to use the math module, you would write import math. This makes all the functions and constants in the math module available for use in your program.
Option A (reap), B (dir), and C (input) do not serve the purpose of importing modules. dir is used to list the attributes of an object, input is used to get user input, and reap is not a valid Python command related to importing modules.
Supporting
Reference:
Python Documentation on Imports: The Python documentation provides clear guidelines on how to use the import statement to include modules in your Python scripts.

QUESTION 14
Using the set rest control configuration command, what are two ways to control access to the REST API running on a Junos device? (Choose two.)

A. Limit management access to only SSH
B. Limit management access to specific users.
C. Limit the number of simultaneous connections.
D. Limit access to only certain source IP addresses

Correct Answer: C, D
Section:
Explanation:
When using the set rest control configuration command on a Junos device, you have several options to control access to the REST API. Two effective methods include:
Limiting the number of simultaneous connections: This ensures that the REST API is not overwhelmed by too many concurrent requests, which could potentially lead to performance issues or denial of service.
Limiting access to certain source IP addresses: This method restricts API access to specific IP addresses, enhancing security by ensuring that only trusted sources can interact with the REST API.
Option A (Limit management access to only SSH) is unrelated to controlling REST API access specifically.
Option B (Limit management access to specific users) might be relevant in a different context, but it is not directly tied to REST API control via the specific command mentioned.
Supporting
Reference:
Juniper Networks REST API Documentation: This documentation explains how to configure and control access to the REST API on Junos devices, including connection limits and IP-based access control.

QUESTION 15
Which two statements about the REST API are correct? (Choose two.)

A. The TCP session state is maintained by the server.
B. The REST API application is stateless.
C. The TCP session state is maintained by the client
D. The REST API application is stateful.

Correct Answer: B, C
Section:
Explanation:
REST (Representational State Transfer) is an architectural style for designing networked applications, and its key principles include:
Statelessness (B): Each request from the client to the server must contain all the information needed to understand and process the request. The server does not store any session state between requests, meaning each request is independent and does not rely on previous ones.
TCP Session State (C): While REST itself is stateless, the underlying TCP connection's state, such as keeping the connection alive or managing retries, is handled by the client. The server does not retain information about the TCP connection beyond the processing of the individual request.
Options A and D are incorrect because they imply that the REST API is stateful, which contradicts the stateless nature of REST.
REST API Design Principles: Describes the stateless nature of REST and the responsibility of clients in managing session state.
Web Development Documentation: Discusses how REST APIs operate, focusing on statelessness and client-server interaction.

QUESTION 16
Which two standard logical operators does XPath support? (Choose two.)

A. IOR
B. NOT
C. AND
D. MAMD

Correct Answer: B, C
Section:
Explanation:

XPath is a query language used for selecting nodes from an XML document. It supports various logical operators that can be used to create complex queries. The two standard logical operators supported by XPath are:
NOT: This operator negates a condition, returning true if the condition is false, and vice versa.
AND: This operator is used to combine two conditions, and it returns true only if both conditions are true.
Option A (IOR) and Option D (MAMD) are not standard XPath operators.
Supporting
Reference:
XPath Documentation: The W3C XPath specification lists the standard operators supported in XPath, including AND and NOT.

QUESTION 17
Which statement about the NETCONF content layer is true?

A. It uses YAML for RPC request and response payloads.
B. It uses XML for RPC request and response payloads.
C. It uses JSON for RPC request and response payloads.
D. It uses HTML for RPC request and response payloads.

Correct Answer: B
Section:
Explanation:
The NETCONF protocol, used for network management, utilizes XML for encoding the RPC (Remote Procedure Call) requests and responses. XML is chosen because of its flexibility and ability to represent hierarchical data structures, making it well-suited for representing network configurations and states.
Option B is correct because XML is the standard format used for NETCONF RPC payloads.
Options A (YAML), C (JSON), and D (HTML) are incorrect because these formats are not used by NETCONF for its RPC payloads.
Supporting
Reference:
RFC 6241 - NETCONF Protocol: This RFC describes the use of XML for encoding NETCONF messages.

QUESTION 18
You are asked to use the REST API to retrieve interface configuration information from your Junos device. You decide to use a cURL HTTP GET command to retrieve this information.
In this scenario, which statement is correct?

A. The request is handled by the mod process running on the Junos device.
B. The request is handled by the isrpd process running on the Junos device.
C. The request is handled by the rpd process running on the Junos device.
D. The request is handled by the isd process running on the Junos device

Correct Answer: B
Section:
Explanation:
When using the REST API on a Junos device, the isrpd (Integrated Service Routing Process Daemon) process is responsible for handling REST API requests. This process listens for incoming HTTP requests and processes them accordingly, including retrieving interface configuration information when a GET request is made.
Option B is correct because the isrpd process handles the REST API requests on a Junos device.
Options A (mod process), C (rpd process), and D (isd process) are incorrect in this context as they either do not exist or serve different purposes on a Junos device.
Supporting
Reference:
Juniper Networks REST API Documentation: Provides insights into how REST API requests are managed and processed by the isrpd process on Junos devices.

QUESTION 19
Which two statements about XML schema definition (XSD) files are correct? (Choose two.)

A. XSD files define all the elements in an XML document and the document XML hierarchy.
B. Every XML document must have an XSD file defined for it.
C. An XSD file is not an XML document.
D. XSD files ensure that everyone working with the XML document uses a common set of tags.

Correct Answer: A, D
Section:
Explanation:
XML Schema Definition (XSD) files are used to define the structure and data types of an XML document. They ensure that the XML document adheres to a specific structure by defining the allowed elements, attributes, and their data types, thereby enforcing a consistent format.
Option A is correct because XSD files define the elements, attributes, and structure (hierarchy) of an XML document.
Option D is correct because XSD files provide a standardized format, ensuring that all parties working with the XML document use the same set of tags and structure.
Option B (Every XML document must have an XSD file defined for it) is incorrect; not every XML document requires an XSD file, although it's beneficial for validation.
Option C (An XSD file is not an XML document) is incorrect because XSD files themselves are written in XML.
Supporting
Reference:
W3C XML Schema Definition (XSD) Documentation: Explains the purpose and structure of XSD files, including their role in defining XML document schemas.

QUESTION 20
Which process is responsible for JET automation requests?

A. jsrpd
B. mgd
C. rpd
D. jsd

Correct Answer: A
Section:
Explanation:
The jsrpd (Junos Scriptable Routing Protocol Daemon) is the process responsible for handling JET (Junos Extension Toolkit) automation requests. The jsrpd process manages interactions with the JET APIs, allowing users to automate and script network operations directly on Junos devices.
Other options like mgd, rpd, and jsd are not responsible for handling JET automation requests. The mgd process handles general management and configuration, rpd is responsible for routing protocols, and jsd handles XML and JET API requests, but the actual management of JET API requests is specifically handled by jsrpd.
Juniper Networks JET Documentation: Provides detailed information on the role of jsrpd in handling JET API requests.
Junos Automation Guide: Discusses the various processes involved in Junos automation, including jsrpd.

QUESTION 21
What are two important aspects of the DevOps culture? (Choose two.)

A. communication
B. separation of duties
C. use of specific tools
D. people

Correct Answer: A, D
Section:
Explanation:

Two important aspects of the DevOps culture are:
Communication (A): In a DevOps environment, continuous and effective communication between development, operations, and other stakeholders is crucial. It ensures that everyone is aligned, reduces misunderstandings, and facilitates faster and more efficient workflows.
People (D): DevOps is as much about the people as it is about the processes and tools. The culture emphasizes collaboration, shared responsibility, and a mindset focused on continuous improvement. Empowering people to work together across different disciplines is at the heart of DevOps.
Options B and C are not primary aspects of the DevOps culture. While tools are essential in implementing DevOps practices, the culture emphasizes communication and collaboration among people more than the use of specific tools or rigid separation of duties.
DevOps Handbook: Discusses the cultural aspects of DevOps, with a focus on communication and people.
DevOps Best Practices: Highlights the importance of fostering a culture that prioritizes collaboration and shared goals.

QUESTION 22
You are asked to use the REST API to retrieve interface configuration information from your Junos device. You decide to use a cURL HTTP GET command to retrieve this information.
In this scenario, which two statements are correct? (Choose two.)

A. You can retrieve this data in HTML or JSON formats.
B. You must have SSH enabled on the Junos device.
C. You can retrieve this data in XML or JSON formats.
D. You must Include the authentication Information with each request.

Correct Answer: C, D
Section:
Explanation:
When using the REST API to retrieve interface configuration information from a Junos device:
Data Formats (C): The information can be retrieved in XML or JSON formats. These are the two standard data formats supported by the Junos REST API for representing configuration and operational data.
Authentication (D): For each HTTP request, especially when using tools like cURL, authentication information must be included. This is typically done using basic authentication (username and password) or an authentication token.
Option A is incorrect because HTML is not a supported format for REST API data retrieval in Junos, and Option B is incorrect because SSH is not required for REST API requests; the REST API typically uses HTTP/HTTPS.
Junos REST API Documentation: Details the data formats (XML, JSON) supported by the Junos REST API and the need for authentication.
cURL Usage with REST API: Provides examples of how to use cURL with Junos REST API, including the necessity of providing authentication.

QUESTION 23
Which two programming languages are used for Junos on-box scripting? (Choose two.)

A. Perl
B. Ruby
C. SLAX
D. XSLT

Correct Answer: C, D
Section:
Explanation:
Junos on-box scripting supports the following programming languages:
SLAX (C): SLAX (Structured Language for XML) is a scripting language designed specifically for Junos devices. It allows for easy manipulation of XML data, making it ideal for creating Junos scripts that interact with device configurations.
XSLT (D): XSLT (Extensible Stylesheet Language Transformations) is another language used for transforming XML documents into other formats. It is commonly used in Junos for transforming XML data into different views or outputs.
Options A (Perl) and B (Ruby) are not used for Junos on-box scripting. While these languages are popular in other contexts, Junos scripting relies heavily on XML-based languages like SLAX and XSLT.
Junos XML API and Scripting Guide: Describes the use of SLAX and XSLT for on-box scripting.
Juniper Networks Automation Documentation: Provides examples and best practices for using SLAX and XSLT in Junos scripting.

QUESTION 24
Which process is responsible for XML automation requests?

A. jsrpd
B. mgd
C. rpd
D. jsd

Correct Answer: B
Section:
Explanation:
The mgd (Management Daemon) process in Junos is responsible for handling XML automation requests. This daemon manages the configuration and operational commands received via NETCONF, which uses XML for data exchange. The mgd process parses the XML data and applies the necessary configuration or retrieves the requested information.
Option B is correct because mgd is the process that handles XML-based requests in Junos.
Options A (jsrpd), C (rpd), and D (jsd) are incorrect because they are responsible for different functions, such as routing protocols and services, not XML automation.
Supporting
Reference:
Juniper Networks Management Daemon (mgd) Documentation: Provides an overview of the responsibilities of the mgd process, including handling XML requests.