

Vendor: Microsoft

Exam Code: AZ-400

**Exam Name:** Microsoft Azure DevOps Solutions

**Version: DEMO** 

### **QUESTION 1**

Case Study 1 - Litware

Overview

# **Existing Environment**

Litware, Inc. e an independent software vendor (ISV). Litware has a main office and five branch offices.

### **Application Architecture**

The company's primary application is a single monolithic retirement fund management system based on ASP.NET web forms that use logic written in VB.NET. Some new sections of the application are written in C#.

Variations of the application are created for individual customers. Currently, there are more than 80 live code branches in the application's code base.

The application was developed by using Microsoft Visual Studio. Source code is stored in Team Foundation Server (TFS) in the main office. The branch offices access the source code by using TFS proxy servers.

#### **Architectural Issues**

Litware focuses on writing new code for customers. No resources are provided to refactor or remove existing code. Changes to the code base take a long time, as dependencies are not obvious to individual developers.

Merge operations of the code often take months and involve many developers. Code merging frequently introduces bugs that are difficult to locate and resolve.

Customers report that ownership costs of the retirement fund management system increase continually. The need to merge unrelated code makes even minor code changes expensive.

Customers report that bug reporting is overly complex.

What should you use to implement the code quality restriction on the release pipeline for the investment planning applications suite?

- A. a trigger
- B. a pre deployment approval
- C. a post-deployment approval
- D. a deployment gate

# **Answer:** D **Explanation:**

Deployment gate - You want to ensure there are no active issues in the work item or problem management system before deploying a build to a stage - "Pre-deployment gates".

### References:

https://docs.microsoft.com/en-us/azure/devops/pipelines/release/approvals/approvals https://docs.microsoft.com/en-us/azure/devops/pipelines/release/approvals/?view=azure-devops

#### **QUESTION 2**

Case Study 2 - Contoso, Ltd

### Background

Contoso, Ltd. is a manufacturing company that has a main office in Chicago.

Contoso plans to improve its IT development and operations processes by implementing Azure DevOps principles. Contoso has an Azure subscription and creates an Azure DevOps organization.

The Azure DevOps organization includes:

- The Docker extension
- A deployment pool named Pool7 that contains 10 Azure virtual machines that run Windows Server 2016

The Azure subscription contains an Azure Automation account.

Contoso plans to create projects in Azure DevOps as shown in the following table.

| Project name | Project details  |
|--------------|--|
| Project 1    | Project1 will provide support for incremental builds and third-party SDK components  |
| Project 2    | Project2 will use an automatic build policy. A small team of developers named Team2 will work independently on changes to the project. The Team2 members will not have permissions to Project2.        |
| Project 3    | Project3 will be integrated with SonarQube   |
| Project 4    | Project4 will provide support for a build pipeline that creates a Docker image and pushes the image to the Azure Container Registry. Project4 will use an existing Dockerfile.                         |
| Project 5    | Project5 will contain a Git repository in Azure Reports and a continuous integration trigger that will initiate a build in response to any change except for changes within/folder1 of the repository. |
| Project 6    | Project6 will provide support for build and deployment pipelines. Deployment will be allowed only if the number of current work items representing active software bugs is 0.                          |
| Project 7    | Project7 will contain a target deployment group named Group7 that maps to Pool7. Project7 will use Azure Automation State Configuration to maintain the desired state of the computers in Group7.      |

In Azure DevOps, you create Project3.

You need to meet the requirements of the project.

What should you do first?

- A. From Azure DevOps, create a service endpoint.
- B. From SonarQube, obtain an authentication token.
- C. From Azure DevOps, modify the build definition.
- D. From SonarQube, create a project.

# Answer: A Explanation:

The first thing to do is to declare your SonarQube server as a service endpoint in your VSTS/DevOps project settings.

References:

https://docs.sonarqube.org/display/SCAN/Analyzing+with+SonarQube+Extension+for+vsts-TFS

# QUESTION 3 Case Study 3 - Woodgrove Bank Overview General Overview

Woodgrove Bank is a financial services company that has a main office in the United Kingdom.

# **Technical Requirements and Planned Changes Planned Changes**

Woodgrove Bank plans to implement the following project management changes:

- Implement Azure DevOps for project tracking.
- Centralize source code control in private GitHub repositories.
- Implement Azure Pipelines for build pipelines and release pipelines.

Woodgrove Bank plans to implement the following changes to the identity environment:

- Deploy an Azure AD tenant named woodgrovebank.com.
- **Sync the Active Directory domain to Azure AD.**
- Configure App1 to use a service principal.
- Integrate GitHub with Azure AD.

Woodgrove Bank plans to implement the following changes to the core apps:

- Migrate App1 to ASP.NET Core.
- Integrate Azure Pipelines and the third-party build tool used to develop App2.

Woodgrove Bank plans to implement the following changes to the DevOps environment:

- Deploy App1 to Azure App Service.
- Implement source control for the DB1 schema.
- Migrate all the source code from TFS1 to GitHub.
- Deploy App2 to an Azure virtual machine named VM1.
- Merge the POC branch into the GitHub default branch.
- Implement an Azure DevOps dashboard for stakeholders to monitor development progress.

You plan to deploy a new database environment. The solution must meet the technical requirements.

You need to prepare the database for the deployment.

How should you format the export?

- A. NDF
- B. BACPAC
- C. DACPAC
- D. MDF

# Answer: B Explanation:

The initial databases for new environments must contain both schema and reference data. When you need to export a database for archiving or for moving to another platform, you can export the database schema and data to a BACPAC file. A BACPAC file is a ZIP file with an extension of BACPAC containing the metadata and data from the database. A BACPAC file can

be stored in Azure Blob storage or in local storage in an on-premises location and later imported back into Azure SQL Database, Azure SQL Managed Instance, or a SQL Server instance.

#### Reference:

https://docs.microsoft.com/en-us/azure/azure-sql/database/database-export

#### **QUESTION 4**

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You integrate a cloud-hosted Jenkins server and a new Azure DevOps deployment.

You need Azure DevOps to send a notification to Jenkins when a developer commits changes to a branch in Azure Repos.

Solution: You add a trigger to the build pipeline.

Does this meet the goal?

A. Yes

B. No

# Answer: B Explanation:

You can create a service hook for Azure DevOps Services and TFS with Jenkins. The code push event is triggered when the code is pushed to a Git repository.

#### Reference:

https://docs.microsoft.com/en-us/azure/devops/service-hooks/services/jenkins https://docs.microsoft.com/en-us/azure/devops/service-hooks/events

### **QUESTION 5**

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You have an approval process that contains a condition. The condition requires that releases be approved by a team leader before they are deployed.

You have a policy stating that approvals must occur within eight hours.

You discover that deployments fail if the approvals take longer than two hours.

You need to ensure that the deployments only fail if the approvals take longer than eight hours.

Solution: From Pre-deployment conditions, you modify the Timeout setting for pre-deployment approvals.

Does this meet the goal?

A. Yes

B. No

# Answer: A Explanation:

Pre-Deployment Approvals are used to select the users who approve or reject deployments at this stage and set the time allowed for the approval.

Gates are used to do Evaluation before the deployment.

#### References:

https://docs.microsoft.com/en-

us/azure/devops/pipelines/release/approvals/approvals?view=azure-devops https://docs.microsoft.com/en-us/devops/develop/what-is-continuous-integration

### **QUESTION 6**

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

Your company has a project in Azure DevOps for a new web application.

You need to ensure that when code is checked in, a build runs automatically.

Solution: From the Continuous deployment trigger settings of the release pipeline, you enable the Pull request trigger setting.

Does this meet the goal?

A. Yes

B. No

# Answer: B Explanation:

In Visual Designer you enable continuous integration (CI) by:

- 1. Select the Triggers tab.
- 2. Enable Continuous integration.

A continuous integration trigger on a build pipeline indicates that the system should automatically queue a new build whenever a code change is committed.

#### Reference:

https://docs.microsoft.com/en-us/azure/devops/pipelines/get-started-designer

### **QUESTION 7**

Your company hosts a web application in Azure. The company uses Azure Pipelines for the build and release management of the application.

Stakeholders report that the past few releases have negatively affected system performance.

You configure alerts in Azure Monitor.

You need to ensure that new releases are only deployed to production if the releases meet defined performance baseline criteria in the staging environment first

What should you use to prevent the deployment of releases that fail to meet the performance baseline?

- A. a trigger
- B. an Azure function
- C. a gate
- D. an Azure Scheduler job

# Answer: C Explanation:

Scenarios and use cases for gates include:

Quality validation. Query metrics from tests on the build artifacts such as pass rate or code coverage and deploy only if they are within required thresholds.

Use Quality Gates to integrate monitoring into your pre-deployment or post-deployment. This ensures that you are meeting the key health/performance metrics (KPIs) as your applications move from dev to production and any differences in the infrastructure environment or scale is not negatively impacting your KPIs.

Note: Gates allow automatic collection of health signals from external services, and then promote the release when all the signals are successful at the same time or stop the deployment on timeout. Typically, gates are used in connection with incident management, problem management, change management, monitoring, and external approval systems.

#### References:

https://docs.microsoft.com/en-us/azure/azure-monitor/continuous-monitoring https://docs.microsoft.com/en-us/azure/devops/pipelines/release/approvals/gates?view=azure-devops

### **QUESTION 8**

Your company uses Azure DevOps.

Only users who have accounts in Azure Active Directory can access the Azure DevOps environment.

You need to ensure that only devices that are connected to the on-premises network can access the Azure DevOps environment.

What should you do?

- A. Assign the Stakeholder access level all users.
- B. In Azure Active Directory, configure risky sign-ins.
- C. In Azure DevOps, configure Security in Project Settings.
- D. In Azure Active Directory, configure conditional access.

Answer: D

## **Explanation:**

Conditional Access is a capability of Azure Active Directory. With Conditional Access, you can implement automated access control decisions for accessing your cloud apps that are based on conditions.

Conditional Access policies are enforced after the first-factor authentication has been completed.

#### References:

https://docs.microsoft.com/en-us/azure/active-directory/conditional-access/overview

#### **QUESTION 9**

You have a project in Azure DevOps. You have an Azure Resource Group deployment project in Microsoft Visual Studio that is checked in to the Azure DevOps project.

You need to create a release pipeline that will deploy resources by using Azure Resource Manager templates. The solution must minimize administrative effort.

Which task type should you include in the solution?

- A. Azure Cloud Service Deployment
- B. Azure RM Web App Deployment
- C. Azure PowerShell
- D. Azure App Service Manage

# Answer: C Explanation:

There are two different ways to deploy templates to Azure DevOps Services. Both methods provide the same results, so choose the one that best fits your workflow.

- 1. Add a single step to your build pipeline that runs the PowerShell script that's included in the Azure Resource Group deployment project (Deploy-AzureResourceGroup.ps1). The script copies artifacts and then deploys the template.
- 2. Add multiple Azure DevOps Services build steps, each one performing a stage task. The first option has the advantage of using the same script used by developers in Visual Studio and providing consistency throughout the lifecycle. References:

https://docs.microsoft.com/en-us/azure/vs-azure-tools-resource-groups-ci-in-vsts

### **QUESTION 10**

You use release pipelines in Azure Pipelines to deploy an app. Secrets required be the pipeline are stored as pipeline variables. Logging of commands is enabled for the Azure Pipelines agent. You need to prevent the values of the secrets from being logged. What should you do?

- A. Store the secrets in the environment variables instead of the pipeline variables.
- B. Pass the secrets on the command line instead of in the pipeline variables.
- C. Apply a prefix of secret to the name of the variables.
- D. Echo the values of the secrets to the command line.

# Answer: A Explanation:

We make an effort to mask secrets from appearing in Azure Pipelines output, but you still need to take precautions. Never echo secrets as output. Some operating systems log command line arguments. Never pass secrets on the command line. Instead, we suggest that you map your secrets into environment variables.

#### Reference:

https://docs.microsoft.com/en-us/azure/devops/pipelines/process/variables?view=azure-devops&tabs=classic%2Cbatch

#### **QUESTION 11**

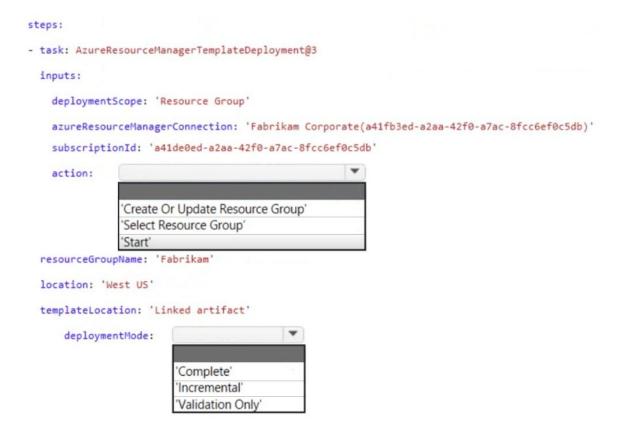
**Hotspot Question** 

You are creating a YAML-based Azure pipeline to deploy an Azure Data factory instance that has the following requirements:

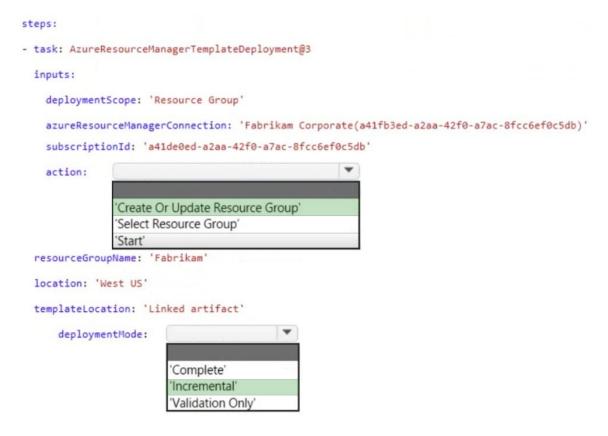
- If a Data Factory instance exists already, the instance must be overwritten.
- No other resources in a resource group named Fabrikam must be affected.

How should you complete the code? To answer, select the appropriate options in the answer area

NOTE: Each correct selection is worth one point.



#### Answer:



### **Explanation:**

Action to be performed on the Azure resources or resource group.

Default value: Create Or Update Resource Group

Incremental mode handles deployments as incremental updates to the resource group. It leaves unchanged resources that exist in the resource group but are not specified in the template. Complete mode deletes resources that are not in your template. Validation mode enables you to find problems with the template before creating actual resources. Note that this mode always creates a resource group, even if no resources are deployed.

https://docs.microsoft.com/en-us/azure/devops/pipelines/tasks/deploy/azure-resource-group-deployment?view=azure-devops

### **QUESTION 12**

Your company is building a new solution in Java.

The company currently uses a SonarQube server to analyze the code of .NET solutions.

You need to analyze and monitor the code quality of the Java solution.

Which task types should you add to the build pipeline?

- A. Chef
- B. Gradle
- C. Octopus
- D. Gulp

Answer: B Explanation:

SonarQube is a set of static analyzers that can be used to identify areas of improvement in your code. It allows you to analyze the technical debt in your project and keep track of it in the future. With Maven and Gradle build tasks, you can run SonarQube analysis with minimal setup in a new or existing Azure DevOps Services build task.

Prepare Analysis Configuration task, to configure all the required settings before executing the build.

- This task is mandatory.
- In case of .NET solutions or Java projects, it helps to integrate seamlessly with MSBuild, Maven and Gradle tasks.

Note: There are several versions of this question in the exam. The question can have three correct answers:

- MSBuild
- Maven
- Gradle

The question can also have different incorrect options, including:

- Chef
- Octopus
- xCODE

#### Reference:

https://docs3.sonarqube.org/latest/analysis/scan/sonarscanner-for-azure-devops/https://docs.microsoft.com/en-us/azure/devops/java/sonarqube?view=azure-devops

#### **QUESTION 13**

You need to consider the underlined segment to establish whether it is accurate.

<u>Black Duck</u> can be used to make sure that all the open source libraries conform to your company's licensing criteria.

Select "No adjustment required" if the underlined segment is accurate. If the underlined segment is inaccurate, select the accurate option.

- A. No adjustment required.
- B. Maven
- C. Bamboo
- D. CMAKE

# Answer: A Explanation:

Secure and Manage Open Source Software

Black Duck helps organizations identify and mitigate open source security, license compliance and code-quality risks across application and container portfolios.

Black Duck Hub and its plugin for Team Foundation Server (TFS) allows you to automatically find and fix open source security vulnerabilities during the build process, so you can proactively manage risk. The integration allows you to receive alerts and fail builds when any Black Duck Hub policy violations are met.

#### **QUESTION 14**

You intend to make use of Azure Artifacts to share packages that you wrote, tested, validated, and deployed.

You want to use a solitary feed to release several builds of each package. You have to make sure that the release of packages that are in development is restricted.

Which of the following actions should you take?

- A. You should make use of static code analysis.
- B. You should make use of views.
- C. You should make use of dynamic code analysis.
- D. You should make use of upstream sources.

# Answer: B Explanation:

Feed views enable developers to share a subset of package-versions with their consumers. A common use of feed views is to share package versions that have been tested and validated but hold back on packages that are still under development.

https://docs.microsoft.com/en-us/azure/devops/artifacts/concepts/views?view=azure-devops

#### **QUESTION 15**

You configure Azure Application Insights and the shared service plan tier for a web app. You enable Smart Detection.

You confirm that standard metrics are visible in the logs, but when you test a failure, you do not receive a Smart Detection notification

What prevents the Smart Detection notification from being sent?

- A. You must restart the web app before Smart Detection is enabled.
- B. Smart Detection uses the first 24 hours to establish the normal behavior of the web app.
- C. You must enable the Snapshot Debugger for the web app.
- D. The web app is configured to use the shared service plan tier.

# Answer: B Explanation:

After setting up Application Insights for your project, and if your app generates a certain minimum amount of data, Smart Detection of failure anomalies takes 24 hours to learn the normal behavior of your app, before it is switched on and can send alerts.

#### Reference:

https://docs.microsoft.com/en-us/azure/azure-monitor/app/proactive-failure-diagnostics

#### **QUESTION 16**

You have a project in Azure DevOps that has a release pipeline.

You need to integrate work item tracking and an Agile project management system to meet the following requirements:

- Ensure that developers can track whether their commits are deployed to production.
- Report the deployment status.
- Minimize integration effort.

Which system should you use?

### A. Trello

- B. Jira
- C. Basecamp
- D. Asana

# Answer: B Explanation:

Jira Software is a development tool used by agile teams to plan, track, and manage software releases. Using Azure Pipelines, teams can configure CI/CD pipelines for applications of any language, deploying to any platform or any cloud.

Note: Microsoft and Atlassian have partnered together to build an integration between Azure Pipelines and Jira Software.

This integration connects the two products, providing full tracking of how and when the value envisioned with an issue is delivered to end users. This enables teams to setup a tight development cycle from issue creation through release. Key development milestones like builds and deployments associated to a Jira issue can then be tracked from within Jira Software.

#### Reference:

https://devblogs.microsoft.com/devops/azure-pipelines-integration-with-jira-software/

### **QUESTION 17**

You have an Azure solution that contains a build pipeline in Azure Pipelines.

You experience intermittent delays before the build pipeline starts.

You need to reduce the time it takes to start the build pipeline.

What should you do?

- A. Split the build pipeline into multiple stages.
- B. Purchase an additional parallel job.
- C. Create a new agent pool.
- D. Enable self-hosted build agents.

# Answer: D Explanation:

An agent that you set up and manage on your own to run jobs is a self-hosted agent. You can use self-hosted agents in Azure Pipelines or Azure DevOps Server, formerly named Team Foundation Server (TFS). Self-hosted agents give you more control to install dependent software needed for your builds and deployments. Also, machine-level caches and configuration persist from run to run, which can boost speed.

https://docs.microsoft.com/en-us/azure/devops/pipelines/agents/agents?view=azure-devops&tabs=browser

## **QUESTION 18**

Drag and Drop Question

You need to increase the security of your team's development process.

Which type of security tool should you recommend for each stage of the development process? To answer, drag the appropriate security tools to the correct stages. Each security tool may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

NOTE: Each correct selection is worth one point.

# Security Tools Answer Area Pull request: Penetration testing Continuous integration: Static code analysis Threat modeling Continuous delivery: Answer: Security Tools Answer Area Penetration testing Pull request: Static code analysis Continuous integration: Static code analysis Static code analysis Threat modeling Continuous delivery: Penetration testing

### **Explanation:**

Box 1: Static code analysis

#### Box 2: Static code analysis

Validation in the CI/CD begins before the developer commits his or her code. Static code analysis tools in the IDE provide the first line of defense to help ensure that security vulnerabilities are not introduced into the CI/CD process.

## Box 3: Penetration testing

Once your code quality is verified, and the application is deployed to a lower environment like development or QA, the process should verify that there are not any security vulnerabilities in the running application. This can be accomplished by executing automated penetration test against the running application to scan it for vulnerabilities.

#### Reference:

https://docs.microsoft.com/en-us/azure/devops/articles/security-validation-cicd-pipeline?view=vsts

https://docs.microsoft.com/en-us/azure/devops/migrate/security-validation-cicd-pipeline?view=azure-devops#ide--pull-request

### **QUESTION 19**

Your company uses GitHub for source control. The company has a team that performs code reviews.

You need to automate the assignment of the code reviews. The solution must meet the following

### requirements:

Prioritize the assignment of code reviews to team members who have the fewest outstanding assignments. Ensure that each team member performs an equal number of code reviews in any 30-day period.

Prevent the assignment of code reviews to the team leader.

Which two actions should you perform? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

- A. Clear Never assign certain team members.
- B. Select If assigning team members, don't notify the entire team.
- C. Select Never assign certain team members.
- D. Set Routing algorithm to Round robin.
- E. Set Routing algorithm to Load balance.

# Answer: CE Explanation:

- 1. The load balance algorithm chooses reviewers based on each member's total number of recent review requests and considers the number of outstanding reviews for each member. The load balance algorithm tries to ensure that each team member reviews an equal number of pull requests in any 30 day period.
- 2. Optionally, to always skip certain members of the team, select Never assign certain team members. Then, select one or more team members you'd like to always skip.

#### Reference:

https://docs.github.com/en/organizations/organizing-members-into-teams/managing-code-review-settings-for-your-team

#### **QUESTION 20**

You have a project in Azure DevOps named Project1. Project1 contains a published wiki.

You need to change the order of pages in the navigation pane of the published wiki in the Azure DevOps portal.

What should you do?

- A. At the root of the wiki, create a file named .order that defines the page hierarchy.
- B. At the root of the wiki, create a file named wiki.md that defines the page hierarchy.
- C. Rename the pages in the navigation pane.
- D. Drag and drop the pages in the navigation pane.

# Answer: A Explanation:

https://docs.microsoft.com/en-us/azure/devops/project/wiki/wiki-file-structure?view=azure-devops#order-file

The .order file defines the sequence of pages within the wiki.

#### **QUESTION 21**

You have a project in Azure DevOps.

You plan to deploy a self-hosted agent by using an unattended configuration script.

Which two values should you define in the configuration script? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

- A. authorization credentials
- B. the project name
- C. the deployment group name
- D. the organization URL
- E. the agent pool name

# Answer: AD Explanation:

Unattended config:

The agent can be set up from a script with no human intervention. You must pass --unattended and the answers to all questions.

To configure an agent, it must know the URL to your organization or collection and credentials of someone authorized to set up agents. All other responses are optional.

#### Reference:

https://docs.microsoft.com/en-us/azure/devops/pipelines/agents/v2-windows

### **QUESTION 22**

You have an Azure DevOps project that uses many package feeds.

You need to simplify the project by using a single feed that stores packages produced by your company and packages consumed from remote feeds. The solution must support public feeds and authenticated feeds.

What should you enable in DevOps?

- A. Universal Packages
- B. upstream sources
- C. views in Azure Artifacts
- D. a symbol server

# Answer: B Explanation:

Upstream sources enable you to use a single feed to store both the packages you produce and the packages you consume from "remote feeds". This includes both public feeds, such as npmjs.com and nuget.org, and authenticated feeds, such as other Azure DevOps feeds in your organization. Once you've enabled an upstream source, any user connected to your feed can install a package from the remote feed, and your feed will save a copy.

#### Reference:

https://azure.microsoft.com/en-us/blog/deep-dive-into-azure-artifacts/

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