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| Azure DevOps Lab  **Microsoft Azure** |
| Module 7. Storage, Backup and Recovery Services.  Home task |

TASK

1. Create base ARM template that will be used for linked templates execution:
   1. Template that will create VM with 1 data disk (use the smallest size of this disk, e.g. 10 Gb);
   2. Templates for additional necessary resources for VM (Vnet, network interface, etc.)
2. **All solution should be represented as PowerShell\Bash script with the following functionality**:
   1. Create Key Vault resource and place secret of your Windows VM credentials into the Key Vault. Secret will be used for creating VM credentials (Could be done via PS, CLI or ARM);
   2. Create VM, Recovery Services Vault with custom Backup Policy via ARM;
   3. Create Storage Account where restored VM disks will be stored via ARM;
   4. Run deployment of the initial ARM template and deploy required linked resources;
   5. After the deployment the script should create Backup of VM (wait for execution) – PS\Bash;
   6. Restore VHDs – PS, Azure CLI;
   7. Restore VM using restored VHDs - ARM.
3. Use Azure Resource Manager template functions to concise your code and follow task requirements (at least one);
4. Create Custom Backup Policy in RS Vault;
5. Clear sensitive data (e.g. credentials) is not presented in templates;
6. VM size should be equal to Standard\_D2s\_v3;
7. Base template with parameters must be called from PS\Bash deployment script and should work without errors.

Result:

1. Deployed VM with necessary resources
2. Valid Key and Recovery Services Vaults
3. Restored VM with attached OS and DATA disks

REQUIREMENTS

1. One JSON file for describing all Azure resources is forbidden. **Please use linked templates.**

2. Linked templates **must be called from the initial deployment template** (main.json).

3. Main and parameters templates must be named as **main.json** and **parameters.json** accordingly.

4. Maximum **number of parameters** in Main.json is 7.

5. Main.json and parameters.json must be **executed from local folder**. Using **-TemplateParameterUri** and **-TemplateUri** options in PS script is forbidden.

6. All artifacts (JSONs and PS files) must be stored in **Azure Storage Account**. Using any GitHubs or other public repos is forbidden.  
7. Create a PowerShell/Bash (using Azure CLI) deployment script, which will be used for running all your deployments. The script should have the following functionality:

                a. Create resource group.

b. Create storage account and container within for artifacts (For example: JSONs, PS file(s), ZIP files).

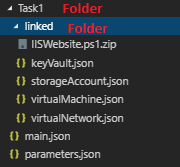
c. Upload the linked templates and other task-related artifacts to the created Storage Account.

d. Execute main.json file for deploy Azure resources.

8. Each ARM json file must have at least **1 output**.

9. All homework **artifacts must be executable** (e.g. if Mentor starts your script execution and it fails - all homework artifacts will be sent back for fixing)

10. All **resources must be deleted** after homework completion.

11. Use the next **folder structure** for storing artifacts. **Subfolder** with resources JSONs must be named **“linked”:**  


Useful links

[Azure Resource Manager template functions](https://docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-template-functions)

[Backup Azure VMs with the Azure Backup Service](https://docs.microsoft.com/en-us/azure/backup/backup-azure-vms-first-look-arm)

# [Best Practices for Using Azure Resource Manager Templates](https://blogs.msdn.microsoft.com/mvpawardprogram/2018/05/01/azure-resource-manager/)