1. Create an AWS account

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1. Create a billing alarm [1$]

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1. Identity and Access Management [IAM]
   1. Create 3 user groups: HCS-Admins, HCS-Developers, HCS-DevOps

* I added no policies because it was not specified

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* 1. Create 6 IAM users: David, <Your\_name>, Horatiu, Laurentiu, Olivia, Adrian.Note: The users need to have AWS Management Console access and a new password needs to berequested at the next sign-in.

Example for David + tag HCS-Foundation-Program

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* 1. Assign users to groups:HCS-DevOps group: Laurentiu, OliviaHCS-Developers group: David, <Your\_name>, HoratiuHCS-Admins group: Horatiu, Laurentiu

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* 1. Add a tag to all users: HCS-Foundation-Program
* See example at 3.2 for David
  1. Add MFA for users: <Your\_name> and Horatiu
* For Dana I used Autenticator app ( from Microsoft)
* For Horatiu I used IBM Verify

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1. Amazon S3
   1. Create a S3 bucket, named <yourfullname>-hcs-foundation-program in us-east-2.Eg: horatiustaicovici-hcs-foundation-program

Note: Bucket – Private, Versioning – Disable, Tag: HCS-Foundation-Program

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4.2. Download a picture with the APPLE logo (black and white) and name it apple.png

4.3. Upload apple.png file into your bucket.

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4.4. Try to open the object’s URL.

- Accessing this <https://danabalasic-hcs-foundation-program.s3.us-east-2.amazonaws.com/apple.png>

Does not work, even if I am removing the HTTPS

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But opening directly works

**A screenshot of a computer

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A black and white apple logo

Description automatically generated

Access for the bucket is blocked, must edit the policies to give access if I want.

4.5. Enable Versioning for <yourfullname>-hcs-foundation-program

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4.6. Download another picture with the APPLE logo (color) and name it apple.png.

4.7. Upload the new apple.png file into your bucket.

A colorful logo with a green leaf

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4.8. List all the apple.png versions

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4.9. Delete apple.png object (the new object)

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A screenshot of a computer

Description automatically generated

4.10. Expend Versions in order to see if the image has been deleted or not

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4.11. Restore the old apple.png image (black and white) without re-uploading the image.

A black and white apple logo

Description automatically generated

4.12. Permanently delete all objects

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4.13. Enable replication for <yourfullname>-hcs-foundation-program into a new bucket<yourfullname>-hcs-foundation-program-replica

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4.14. Download a picture with the IBM logo and name it ibm.png

4.15. Upload ibm.png file into <yourfullname>-hcs-foundation-program and check the replication.

* It appeared after a while

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4.16. Create a life cycle policy to move data from Standard Class IA after 30 days, IA to the Glacier after90 days, and expire after 360 days.

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1. Amazon EC2
   1. Create three EC2s:

Bastion-Server -> Windows VM [in HCS-Public]

Web-Server -> Linux VM [in HCS-Public]

DB-Server -> Linux VM [in HCS-Private]

So first I should create subnets in my default VPC (10.0.0.0/20)– it doesn’t work because the default VPC is public, I cannot make a subnet private, so I must create a new VPC.

HCS-Public 10.0.1.0/24

HCS-Private 10.0.2.0/24

Created the VPC-Dana in OHIO – us-east-2

https://assistanz.com/creating-vpc-public-private-subnets/index.html

The EC2 instance needs an public IP – an Elastic IP attached available in the zone BUT – I need to enable ICMP as well in SG

<https://stackoverflow.com/questions/21981796/cannot-ping-aws-ec2-instance>

The VPCs:

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The EC2 Instances:

* Bastion-Server

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* Web-Server

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* DB-Server

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Description automatically generated

* 1. Are servers reachable? Why? NO, need to modify security group to add an inbound rule to permit echo request ICMP on IPv4

From your WorkStation ping Bastion-Server

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From your WorkStation ping Web-Server

A computer screen with white text

Description automatically generated

From your WorkStation ping DB-Server

A computer screen with white text

Description automatically generated

* 1. Are servers accessible? Why? No – they need security group rule to permit ssh for linux and rdp for windows

Connect to Bastion-Server

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A screenshot of a computer security

Description automatically generated

A screenshot of a computer screen

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I do not know why it adds ‘@ibm.com’ at the end of Administrator; connection through AWS System Manager works

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A screenshot of a computer screen

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On ipconfig it has only the private address:

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The security rules on this ec2 instance:

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Connect to Web-Server

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Description automatically generated

Connect to DB-Server from Web-Server

A computer screen shot of a computer program

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* I don’t know how to add a key in EC2 Instance Connect for Web-Server if I cannot connect from my own workstation to it, I cannot scp/sftp the key to connect to DB-Server, I could have used winscp as well

SO I will use putty agent on my workstation

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Copied the key to AWS EC2 Web-Server in home path:

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It didn’t work, unfortunately. I guess I could also create ssh keys and put them in know-host but I’ll stop for now

A computer screen shot of a black screen

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* 1. Reconfigure the SGs :

Allow SSH for Linux VMs,

Allow RDP for Windows VM and

Allow ICMP – IPv4 from Anywhere [Linux and Windows VMs]

Inbound rules are for incoming traffic

Outbound rules are for outgoing traffic

* For bastion-server
  + Incoming: rdp, icmp
  + Out: icmp

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A screenshot of a computer

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Connection through RDP still fails.

* For Web-server
  + In: ssh, icmp
  + Out: ssh – so I can access db-server, icmp

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* For DB-Server:
  + In: ssh, icmp
  + Out: ssh, icmp
* Used launch-wizard-2 here as well; connection to it doesn’t work, but that should be ok because is on a private VPC
  1. Retry all the PINGs and Connections:

From Bastion-Server ping Web-Server

From Bastion-Server ping DB-Server

From Web-Server ping Bastion-Server

From Web-Server ping DB-Server

From DB-Server ping Web-Server

From DB-Server ping Bastion-Server

Ping www. google.com from Bastion-Server

Ping www.google.com from Web-Server

Ping www.google.com from DB-Server

Cloud Watch

7.1. Create a CloudWatch Alarm for Bastion-Server, in order to generate an alarm (email) for Network Packets IN > 100.

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A screenshot of a computer error

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7.2. Generate some traffic in order to trigger the alarm.

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It stopped

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