

AUTOMATING AMAZON WEB SERVICE AND LINUX AMI CUSTOMIZATION

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Abstract— This project “Automating Amazon Web Service and Linux Ami Customization” is mainly based on the domain Cloud Computing. It is one of the most essential project for industries. This project is for creating a custom AMI from the public AMI provided by Amazon and customizing it for internal company use. This process automate the customization of public AMI, hardening the configuration of company based on their requirements. Many companies will have the requirement to customize the public AMI by creating an instance manually and modifying the configuration manually and creating a custom AMI from that instance. This process will automate the customization process and generalize it so any company can adapt this process by adding their own tools and create a custom image.

Index Terms— AWS (Amazon Web Service), AMI (Amazon Machine Image), EBS (Elastic Block Store), KMS (Key Management System), EC2 (Elastic Compute Cloud)

I. INTRODUCTION

These instructions can also serve as a template for formatting your paper in Microsoft. Cloud computing makes computer system resources, especially storage and computing power, available on demand without direct active management by the user [1]. The term is generally used to describe data centers available to many users over the internet. Large clouds, predominant today, often have functions distributed over multiple locations from central servers. If the connection to the user is relatively close, it may be designated an edge server. Cloud computing provides a simple way to access servers, storage, databases and a broad set of application services over the Internet[2]. A Cloud services platform such as Amazon Web Services owns and maintains the network-connected hardware required for these application services, while you provision and use what you need via a web application. DevOps is the combination of cultural philosophies, practices, and tools that increases an organization’s ability to deliver applications and services at high velocity: evolving and improving products at a faster pace than organizations using traditional software development and infrastructure management processes [3]. This speed enables organizations to better serve their customers and compete more effectively in the market.

II. REQUIREMENT SPECIFICATION

A. Environmental Specification

- AWS services (EC2, S3)
- Console and API access

- Jenkins environment with AWS plugin setup
- Hashicorp packer on the jenkins master server

B. Software Specification

- Operating system: Linux 18.04
- Java 8 • Power Shell - for linux
- Python for common script on AWS
- JSON for creating packer template.

III. EXISTING SYSTEM

This project completely changes the existing system as the existing system involves only the manual process and no automation. For configuring the systems of the organization there is separate team named on board development team in every industry. The work of them is to configure every system in the company according to the need of every particular department in the organization. Manual configuration involves more chance for error. In case of error the action taken to recover it is hard because the on board development team has to go through all the system in that particular department to recover it and after finding it also it will take huge valid time of the organization to restore it as reconfiguration must be taken on every individual system in that department [4].

Drawbacks:

- Cost of implementation is high.
- Huge chances for error.
- Vulnerability to attacks.
- Requires high man power.

IV. PROPOSED IDEA

This project deals with automation of AWS and customizing the Linux AMI provided by the AWS according to the need of the user. Customization of public AMI provided by the AWS for every system due to different department in an organization consumes huge valid time of the industry so it is important to automate it. Consider the single master node and customize it with the requirements. Every customized snapshot is backed with the EBS and encrypted with the amazon KMS[5]. Share the snapshot and key to the target machine after the encryption of EBS. Decrypt the snapshot at the target machine and configure it [6].

Advantage:

- There will be no need of manual work in environment setup.
- Human error is greatly reduced.
- On board development becomes easy.
- One time configuration is enough for the entire industry.

V. SYSTEM ARCHITECTURE

Creating a custom encrypted AMI from the public AMI, and then sharing the custom AMI with encrypted EBS snapshots across accounts and regions. This approach allows you to launch Amazon EC2 instances globally from multiple accounts by using the same base-encrypted AMI.

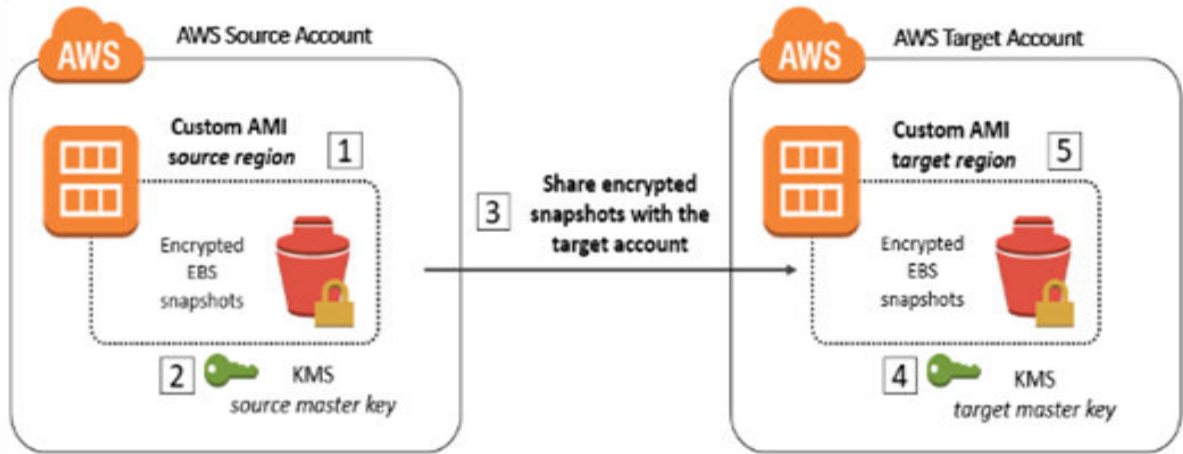


Fig 1. System Architecture

VI. SYSTEM FLOW

The proposed system flow diagram involves the customization of the AMI provided by the AWS at the source and it is backed with the EBS. After encryption of the EBS it is transferred to the target machine with the key. At the target region the backed custom EBS is decrypted and configured.

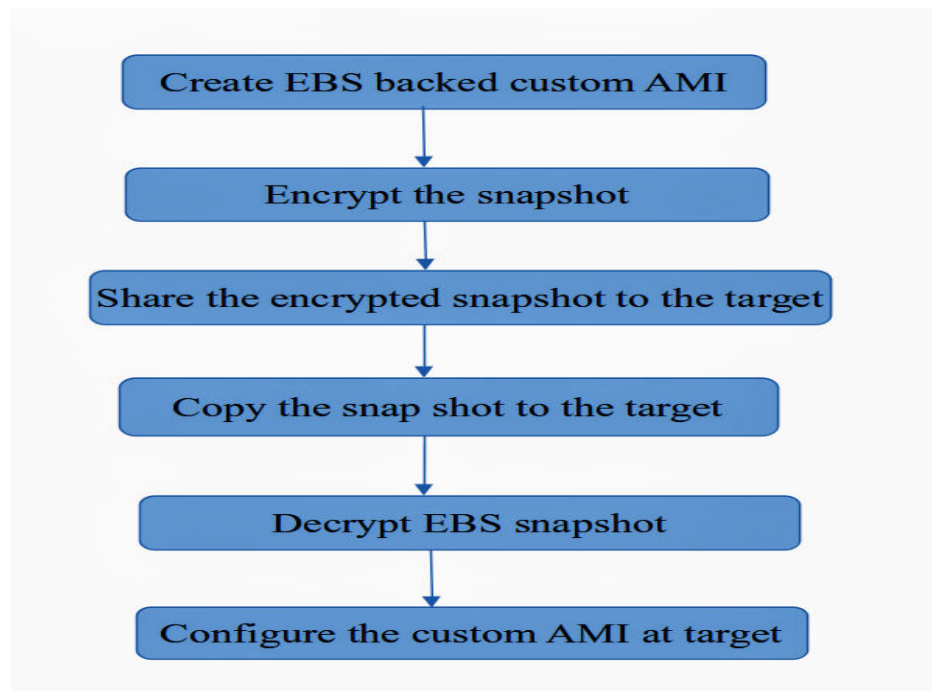


Fig 2. System Flow

VII. MODULE DESCRIPTION

- Module 1 (create EBS backed custom AMI from public AMI)
- Module 2 (share your encrypted snapshots with the target account)
- Module 3 (copy the snapshots to the target region and decrypt them)
- Module 4 (create AMI using encrypted EBS snapshot at the target region)

MODULE 1 (CREATE EBS BACKED CUSTOM AMI FROM PUBLIC AMI)

In the source account, create an EBS-backed custom AMI starting from a public AWS AMI in the source region. Launch an EC2 instance from an EBS-backed public AMI that is similar to the custom AMI that we want to create. Now connect to the EC2 instance, customize the instance with the software and applications, harden the instance, and copy custom data. As the initial stage create the customized AMI from the AMI which is provided by the Amazon Web Service. Customization refers to the mechanism that filtering of services or resources only needed by the user.

MODULE 2 (SHARE YOUR ENCRYPTED SNAPSHOTS WITH THE TARGET ACCOUNT)

Add the encrypted EBS snapshots to the custom AMI, and give the target account access to the KMS encryption keys. Create a custom AMI with encrypted snapshots. Share the encrypted snapshots with the target account. Now the EBS is shared with the key which is generated by the amazon provided key management system.

MODULE 3 (COPY THE SNAPSHOTS TO THE TARGET REGION AND DECRYPT THEM)

Copy the snapshots to the target region and re encrypt them using the target account's KMS encryption keys in the target region. Copy the encrypted snapshot to others individually, and then recreate the AMI in the target account. This is required because the encrypted snapshots could potentially be encrypted under different KMS master keys, and each snapshot copy/decrypt/re encrypt operation needs to happen independently. After the successful receiving of EBS backed AMI with the key, re-encryption takes place at the target region and the configuration can be take place for further process.

MODULE 4 (CREATE AMI USING ENCRYPTED EBS SNAPSHOT AT THE TARGET REGION)

Have the target account create an AMI using the encrypted EBS snapshots in the target region. Copy the snapshots to the target region and re encrypt them using the target account's KMS encryption keys in the target region. Now you can use the custom AMI that you copied from the source account in us-east-1 to launch EC2 instances in eu-west-1 using the target account. The custom AMI makes use of the configurations that you customized in the source account, and all stored data is encrypted end to end.

VIII. FEASIBILITY STUDY

A feasibility study is the test of system proposal made to identify whether the user needs may be satisfied using the current software. Organization is the place where it is divided into number of departments and divisions. And need of everyone in the different divisions are also different and it is the responsibility of the organization to provide them the required technical support like configuration and deploying the common technical service or software they required for this purpose. An organization utilizes their man power and minimal level of automation for this purpose.

Automating it entirely can reduce the maximum amount of time and cost required for the on board development process and also reduces the work of on board development team greatly. Implementation of this method involves less cost and it is time saving technique.

Results

We implement the secure transformation of configuration settings between the systems and we also provide one time configuration of requirements that the department needed for the industry. This is achieved by creating one instance as common and sharing that to the target regions. This enables you to launch consistent instances globally based on your approved AMI, in order to meet your security and compliance requirements, while improving your agility and availability by distributing your workload. Every instance that is created will be encrypted by using the amazon provided KMS. Sharing of instance also involves sharing of the source account's encrypted private key. The custom AMI makes use of the configurations that we customized in the source account, and all stored data is encrypted end to end.

IX. CONCLUSION

Conclusion

The Cloud computing has dramatically changed how the business application are built and run. This enables you to launch consistent instances globally based on your required customized AMI. The replacement of separate server by cloud and human by the automation is done in this project. Amazon Web Service KMS helps to enhance the security of the process. By automating the process of customization huge valid time of the industry is saved and this time can be utilized for project development process which makes their clients happy for the fastest completion of the given project. This project involves minimal man power, cost and time utilization. It also provide the centralized control for configuration.

Future Enhancement:

For Further implementation of this project, configuration made at the master or source node is also to be automated according to the various department in the industry so that additional time saving is achieved and project delivery time will be reduced.

APPENDIX

SNAPSHOTS

1) CREATE EBS BACKED CUSTOM AMI FROM PUBLIC AMI

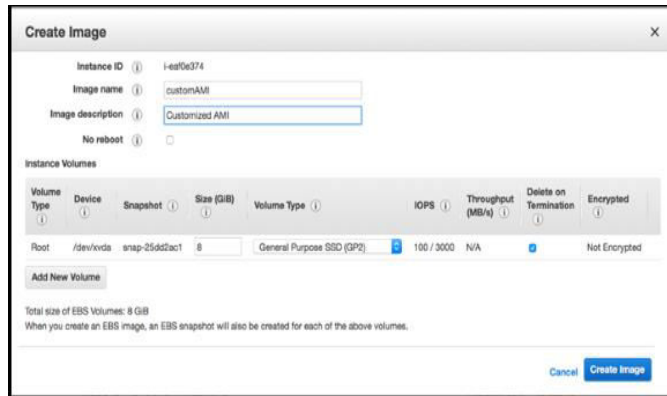


Fig 3 . Create EBS

2) SHARE YOUR ENCRYPTED SNAPSHOTS WITH THE TARGET ACCOUNT

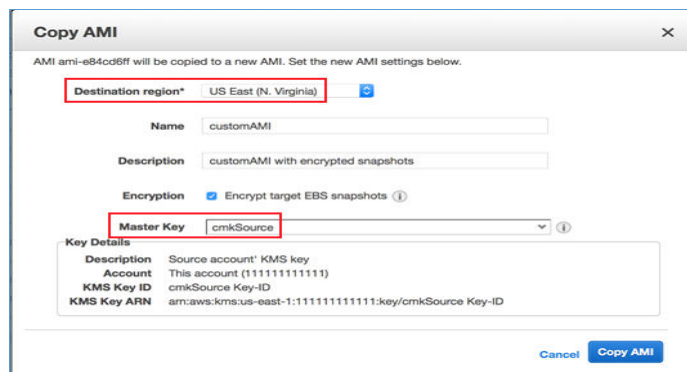


Fig 4 . Share Snapshot

3) COPY THE SNAPSHOTS TO THE TARGET REGION AND DECRYPT THEM

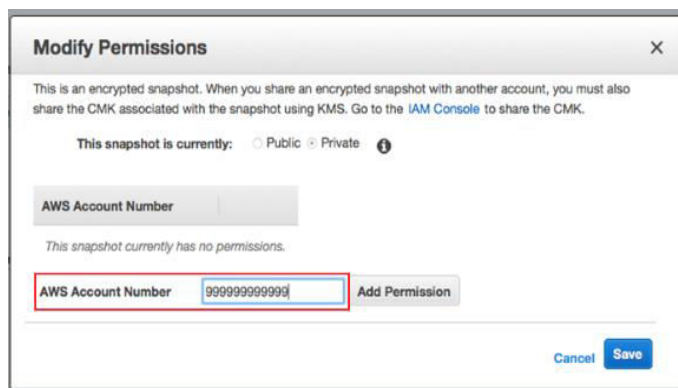


Fig 5 . Copy Snapshot

4) CREATE AMI USING ENCRYPTED EBS SNAPSHOT AT THE TARGET REGION

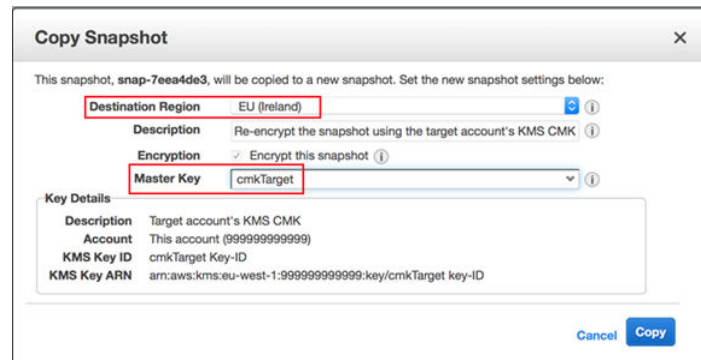


Fig 6 . Create AMI

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