**Cloudpacity Backup Documentation**

# Overview

The Cloudpacity Backup facility provides an AWS Lambda based set of functions that will backup AWS EC2 instances in three different ways:

1. **AMI** – requires stop/start of running instances
2. **Snapshot No Reboot** – takes snapshots of all EBS volumes without rebooting the instance.
3. **Snapshot** – takes snapshots of all EBS volumes with reboot of the instance.

# Functional Summary

**Selection of Instances:** The instances to be backed up need to have the tag BackupStrategy specified, otherwise the instance will not be considered for backup. Additionally, a filter tag (name/value pair) can be specified to filter the instances looked at (Filter1TagName & Filter1TagValue).

**Determine Order of Start/Stop:** The ***InstanceDependencies*** tag is an optional tag that identifies the ids of other instances that an instance has dependencies on. For startup, this indicates which instances should be started BEFORE this instance is started.  In the case of shutdown, it represents instances that should be shut down AFTER this instance is stopped.  If an instance is running and it’s date is not the current date and it’s time is not with the time range, the instance will be shut down.

**Tag & Default Overrides:** Since many organizations have standards on tag naming, environment variables can be passed to change the tags that are used for the day, begin time and end time. Environment variable can also be passed in to override the default maximum run time, maximum recursive calls, pause between recursive calls and default time zone. See below for details

**Multiple Backup Jobs:** Multiple backup jobs (Lambda functions) can be created utilizing the CloudFormation scripts CloudpacityBackupJobCreation-CF.yaml AFTER the basic backup service has been created with the CloudpacityBackupServiceCreation-CF.yaml script

# Installation

1. Upload the project jar file into an AWS S3 bucket of your choosing. It can be found in the project root directory (cloudpacity-backup-<version>.jar): <https://github.com/AsperitasConsulting/CloudpacityAWSBackup/tree/master/cloudpacity-backup>

2. Download the AWS CloudFormation script in the scripts directory: <https://github.com/AsperitasConsulting/CloudpacityAWSBackup/blob/master/cloudpacity-backup/scripts/CloudpacityBackupServiceCreation-CF.yaml>

3. Run AWS CloudFormation script CloudpacityBackupServiceCreation-CF.yaml and enter the following parameters:

BackupFilterTagName – the name of the tag that will be used as a filter for the instances to be backed up

BackupFilterTagValue – the value of the tag that will be used as a filter for the instances to be backed up

BackupLambdaFunctionName – The name you give the Lambda function for the Backup job

BackupRoleName – the name of the role that will be created for the Backup Lambda function

BackupTriggerLambdaFunctionName – The name you give to the Lambda function that will be recursively called if the Backup Lambda function goes beyond the 5 minute limit.

InstanceTagsToInclude – A common delimited list of instance tags that should be applied to the AMI and/or Snapshots. Note: Timestamp and instance id tags will be added by default and the name of the AMI/Snapshot will be a concatenation of the instance name plus the timestamp. Snapshots get the device placed at the end of their name to provide uniqueness.

NotificationEmail – the email to be notified when the job completes

S3CodeBucket – the bucket where the Backup jar is located

S3CodeKey – the filename of the jar in the bucket e.g. cloudpacity-backup-<version>.jar

Schedule – the schedule on which the Backup job should be run. Format rate(x minutes), rate(x hours), rate(x days), cron(<mins> <hours> <day of month> <month> <day of week> <year>) e.g. cron(0 12 ? \* SUN-SAT \*) represents everyday at noon

# Architecture



# EC2 Instance Tags Required

***BackupStrategy*** (required)- determines the method to be used when backing up the instance. The instance will not be backed up if the tag is not specified or if it has an invalid value.

**AMI** – requires stop/start of running instances

**SnapshotRunning**– takes snapshots of all EBS volumes without rebooting the instance.

**Snapshot** – takes snapshots of all EBS volumes with a reboot of the instance.

***InstanceDependencies*** (optional)- a comma delimited list of instance ids for the instances that this instance depends on.  For startup, this indicates which instances should be started BEFORE this instance is started.  In the case of shutdown, it represents instances that should be shut down AFTER this instance is stopped.  If an instance is running and its date is not the current date and it’s time is not with the time range, the instance will be shut down.

# Lambda Environment Variables

The following environment variables can be specified for the Lambda function to override default behavior.

***PauseSecs*** – the seconds to pause between recursive calls

***MaxRecursiveCalls*** – the maximum number of recursive calls

***MaxRunMinutes*** – the maximum total run time

***TimeZone*** – the default time zone e.g UTC, CDT, PST, etc

***Filter1TagName*** – the name of the tag used to filter instances being stopped/started

***Filter1TagValue*** – the value of the tag used to filter instances to stopped/started

***BackupStrategyTag*** – override the default tag name used to specify the backup strategy – default BackupStrategy

***DeviceTag*** - override the default tag name to use to specify the device id on snapshots – default Device

***ImageIdTag*** - override the default tag name to use to specify instance dependencies – default InstanceDependencies

***InstanceDependenciesTag*** - override the default tag name to use to specify the image id on snapshots – default ImageId

***InstanceIdTag*** – override the default tag used to specify the instanceId – default InstanceId

***TimestampTag*** – override the default tag used to specify the creation timestamp – default CreationTimestamp