RackWare

Migration & DR for Amazon Web Services with the RackWare Management Module

White Paper Author
Zach Peters

November 6, 2014

WHITE PAPER

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Use of AWS within Enterprises today

AWS is the most popular public cloud today, with great ability to scale and tremendous flexibility in pricing and configurations. While enterprises have begun to use AWS, they have done so in small pockets in various departments. These use cases have typically been led by developers but have not been part of a globally approved IT strategy.

How Enterprises can Leverage AWS as an Extension of their Internal Environments

RackWare allows enterprises to harness the strengths of AWS with proven solutions for migration, DR and hybrid scaling, allowing enterprises to move entire environments of modern and legacy workloads to AWS. RackWare Management Module, RackWare's flagship hybrid cloud management product integrates with AWS features such as EC2, S3, VPC, EBS, Direct Connect and AutoScaling, to provide enterprise-class DR, migration and hybrid cloud scaling.

AWS and RackWare Use Cases

USE CASES->	MIGRATION TO AWS	HYBRID ELASTIC SCALING INTO AWS	CLOUD DR TO AWS
RACKWARE FEATURES	Ability to migrate any workload – modern or legacy to AWS	Auto-scaling into AWS when internal capacity is exceeded.	Ability to protect any workload modern or legacy using AWS as a secondary site with pre-defined RPO and RTO
INTEGRATION WITH AWS FEATURE	Integrations with Amazon EC2, S3 and EBS	Integration with AWS Autoscaling	Integration with AWS Direct Connect
BENEFITS	Migration steps reduced from hundreds to a few. Migration time reduced from several weeks to a few hours.	Enterprises can deploy a truly hybrid scaling solution where they can burst into AWS with the help of RackWare's auto-scaling, then scale as needed within AWS.	Protection for cloud, virtualized and legacy apps in AWS, automated state and data synchronization, failure detection, failover and failback.

The use cases above will become clearer with the customer example below that highlights step by step what the processes for cloud migration, DR and hybrid scaling to AWS are.

About RackWare Management Module (RMM)

RMM is a software product that decouples the application stack from the underlying platform allowing it to be ported to any new platform. RMM includes discovery, analysis and automation features allowing the migration process to be fast, easy and error-free. Hundreds of customers have moved thousands of workloads between platforms and between internal and cloud environments using RMM. RMM also offers replication, sync and monitoring features that permit cost-effective Cloud DR deployments.

Customer Example: Company A

Company A is a customer that with legacy onsite infrastructure and needs additional capacity during peak utilization. Customer, partners and employees use the web application to collaborate with each other using a mobile API's and a rich web interface. As monthly sales are announced, demands generates large amounts of traffic to the site resulting in latency in the customers' experience.

Application Architecture

Using a standard 3-tier application architecture, Company A deploys a frontend hardware-based load balancer, which manages traffic across two Apache web servers. The application is running behind a company firewall (DMZ) and uses standard SSL encryption. The backend business logic is implemented in Java, and leverages Tomcat as the application container and application server, and three Tomcat servers power the website. The application also has a database layer which consists of one master MySQL server and a slave server for greater performance.

Motivation for Migration

Company A would like to move the web app to the AWS environment for these reasons

1. The company wishes to scale out the web application, and address the growing traffic, without investing in new hardware
2. They would like to deploy a secondary DR site in AWS for their 3-tier application
3. Finally, the company would like to expand and provision extra capacity only when it's needed, for example, when running monthly sales.

Use Case 1 - RackWare's AWS Migration Plan, Strategy, & Execution Steps for Company A

Cloud Assessment

During the technical assessment, RMM software discovered that the entire CompanyA.com technology stack was compatible with AWS and could run in Amazon's Cloud.

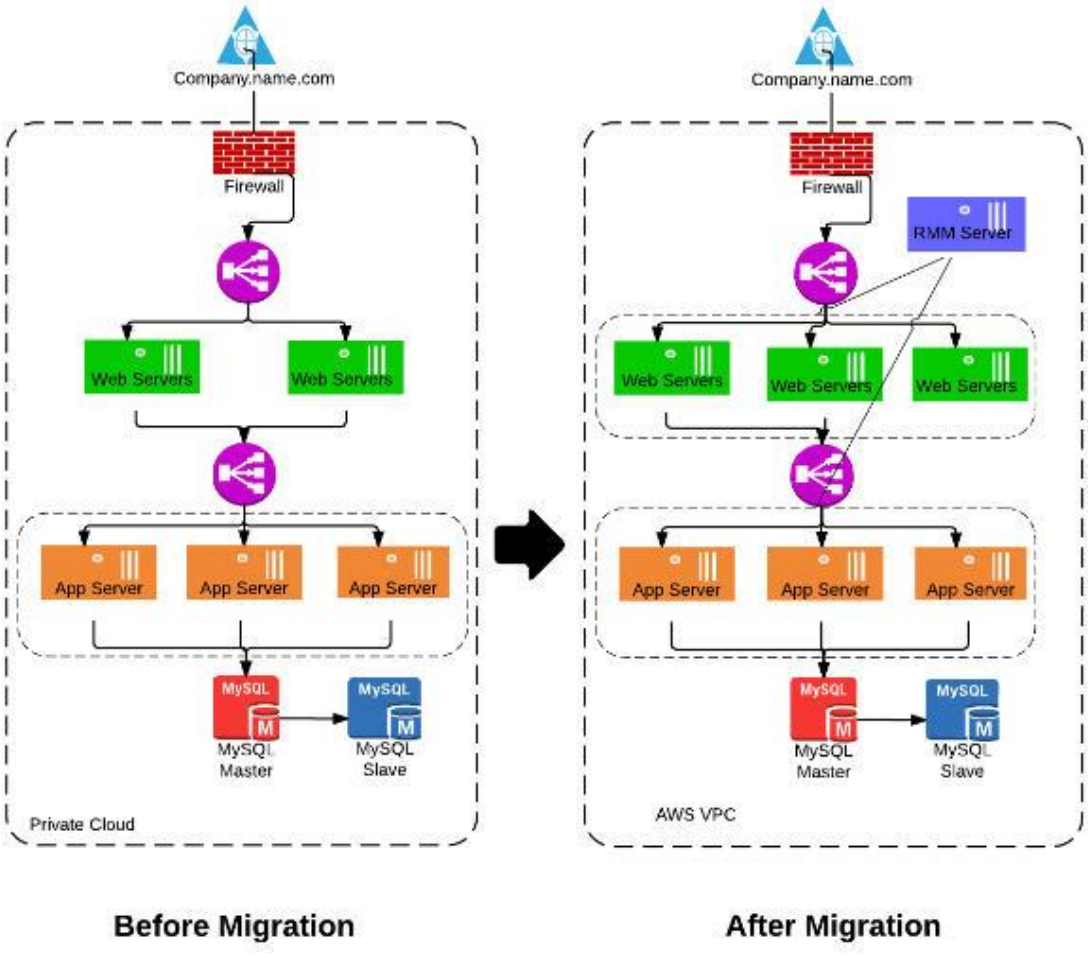


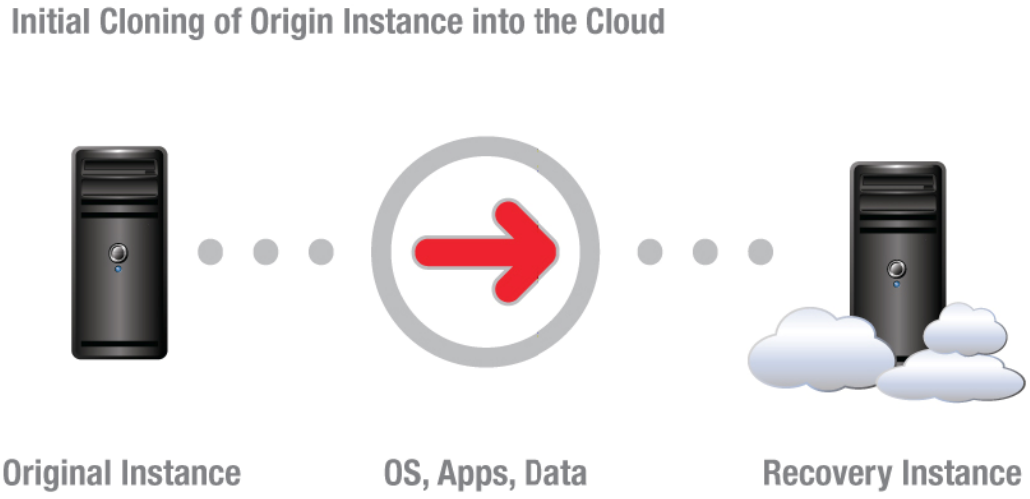
Figure 1

Discovery

The migration team ran RMM's **agentless** discovery services to map the relationships CompanyA.com ecosystem between firewalls, load balancers, web servers, application servers and MySQL DB. The dependence mapping was able to show ports as well as the number of connections between tiers. RackWare's RMM discovery engine was able to monitor performance over time to make recommendations on target sizing.

Capture

RMM has file capture technology, supporting Windows or Linux, application, web and DB x86 architectures, without an agent. The **agentless live capture** was achieved without taking the workload off-line or installing software. RMM captured the complete operating system, application stack and data in single or multiple images. During the capture, RMM removed all source hardware dependences. By removing source dependences including network address and hardware drivers, RMM allows the source workload to be migrated to any new target environment.



Cloud Onboarding

RMM for AWS includes pre-built integrations with AWS to support **automatically creating AWS AMI's** from the requirements gathered during the discovery of the target resources. RMM gives users the option to modify the AMI prior to its creation. The automation removes all manual steps with creating an Amazon shell AMI prior to migrations. Rackware can inherit the target network addresses during the Onboarding processing. Inheriting target networks addresses allows for rapid transition into AWS VPC. RMM's instrumentation can build Amazon Load Balancers and security groups from within the RMM interface.

Assigning

RMM is a point to point migration technology. The technology only requires a single configurable port to be used during migration. Once the target images have been assigned to the AWS shell target, Rackware is able to overwrite the AMI's with the source Image. During this overwrite RackWare is able to inject drives into the captured image and inherit target network addresses. Rackware has pre and post plugin's that can be executed to automate IP's

connections AWS elastic load balances and automate adding host names to AWS directory services.

Replication and Sync

RMM has a built in **live replication and delta syncing** technology with scheduling and policy assignments. This will allow the target to remain running during the sync, with no disruption to service. Individual sync policies enable users to setup sync for DB, application and web tiers on distinctive schedules. The delta engine enable fast migration of only the changed files. Additionally, users can granular select files of directory to select for sync or not to sync. It's recommended to setup a sync policy to insure source and target at kept current.

Phased Migration

During the migration phase Company A has migrated copies of web and application to AWS. Company A has a **phased migration strategy**. The configuration on premise hardware load balancer was modified to send traffic to send request to the new instances in the cloud. After verifying that the servers in the cloud were performing at required levels. The onsite servers were dismissed one by one.

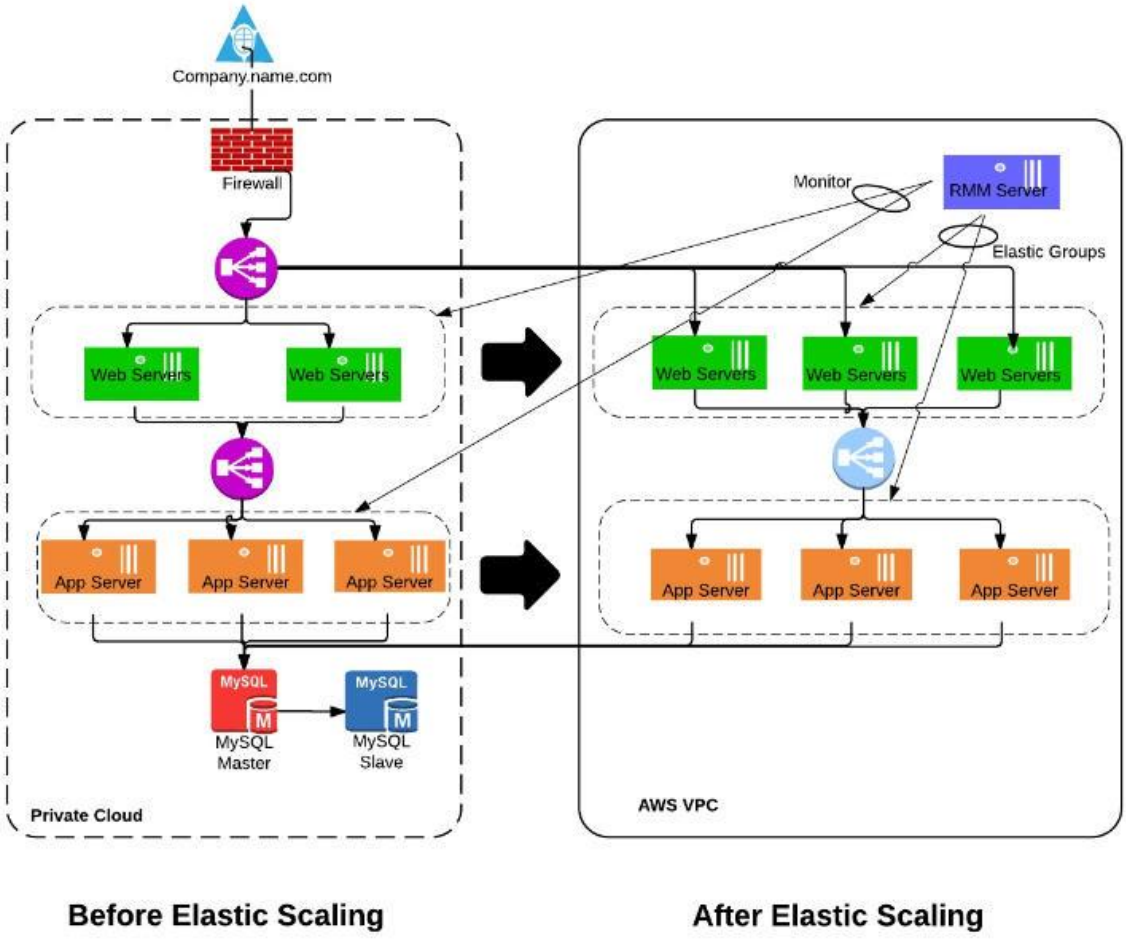
Cut Over

With the nightly sync policy the final cutover was accomplished in a short change window. This change window can be live with the source web site still operational or can be taken off line.

Use Case 2 - RackWare's Hybrid Elastic Scaling with AWS

RMM's scaling features allow an application to be automatically launched in AWS based on meeting certain thresholds for example, maximum number of users exceeded. RMM also integrates with AWS's autoscaling feature to allow application instances that have been moved into AWs to scale up or down.

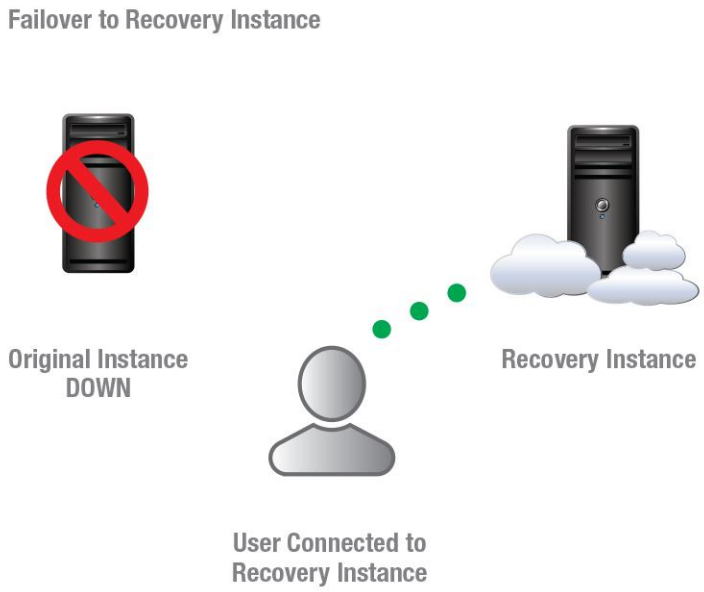
With the RMM and AWS autoscaling integration enterprises can get hybrid scaling – burst out into AWS when internal resources have been maxed and scale elastically within AWS based on load.



Use Case 3 - RackWare's DR to AWS

Rackware provides a Disaster Recovery solution that builds on its Image mobility and elasticity features to bring economic Disaster Recovery for the hybrid cloud. The origin Host Image can reside in remote storage (at the origin site) or on the local disk. If the Image resides on the local disk, the RMM configures the Logical Volume Manager (LVM) on the Host and is used to take periodic snapshots of the Image. If the Image resides remotely, LVM is not required, and a snapshot operation is executed on the Image via the storage array management interface. In the background, an Image sync operation synchronizes any changes in the Image with the Image at the DR site. The overhead on the origin Host is extremely small involving only resources to take a **delta snapshot**. Thus the data overhead of the WAN link incurs only the delta of information, keeping bandwidth needs and sync time to a minimum. It's important that Image updates include user data, Operating System updates, and application installations and configuration changes so that the recovery image behaves exactly like the production

image should a failover occur. The cloud DR feature supports all of these. While OS updates are more infrequent it is still important to ensure that kernel patches are kept in sync with the DR Image. When updating the OS, an image refresh operation is done from the RMM first before the sync to the AWS CloudImage. Should the product system be compromised or inoperable, the CloudImage is automatically launched and is running with the latest synchronized changes.



After the production instance is repaired and operational, it's easy to restore the origin site with any up to date changes made to the CloudImage in the cloud. When the origin site is restored to its operational state, the administrator can utilize the capture from cloud feature to refresh the original Image and synchronize any changes that occurred during the outage.

Summary: AWS allows customers to migrate entire environments into their infrastructure. RackWare allows these customers to build, configure and replicate these complex environments easily and quickly. When these environments need to be customized, customers can simply punch in those desired changes into the RMM tool during replication to allow complex, yet customized migrations and expansions to occur.

Conclusion

By investing in RMM for AWS Company A was able to:

- Successfully migrate an existing web application to the AWS cloud with zero downtime to their current production environment and shaved weeks off their original manual schedule.
- Set up an intelligent hybrid scaling deployment that automatically scales into the AWS when traffic exceeds a pre-defined threshold.
- Protect their crucial application using AWS as the secondary site at roughly 1/10th the price of traditional DR solutions.

Using a phased approach, the development team was able to resolve all the financial, technical and business concerns.

About RackWare

RackWare allows enterprises to use the public cloud as just another resource for their internal infrastructure — for disaster recovery, as well as scaling purposes. With its unique ability to be platform and cloud agnostic, RackWare's flagship solution, the RackWare Management Module (RMM), allows workloads to be ported between any platform, virtual or physical, and any cloud. RackWare has moved thousands of workloads for hundreds of customers and has partnerships with large Service Providers and VARs. RackWare was founded in 2009 and is based in Santa Clara, California. For more information, go to: www.rackwareinc.com.

For more information on RMM for AWS visit http://www.rackwareinc.com/rackware-management-module-aws/ or email info@rackwareinc.com