



LoadMaster for AWS GovCloud

Installation Guide

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1 Introduction

Amazon Web Services (AWS) GovCloud is a cloud service from Amazon aimed specifically at the United States government. It is designed to enable US government agencies and customers to move sensitive workloads into the cloud by addressing specific regulatory and compliance requirements - for example, the International Traffic in Arms Regulations (ITAR) which governs how defense-related data is managed and stored. Specifically, GovCloud segregates the data both logically and physically to ensure that it is only accessible by designated individuals within the United States.

The Kemp Application Delivery Controller (ADC), Virtual LoadMaster, is available in AWS GovCloud Marketplace. Providing resilient pervasive secure delivery of applications within the AWS GovCloud, the Virtual LoadMaster guarantees high availability, ensures security of the application servers, and simplifies integration with on-premises infrastructure.

The AWS GovCloud platform enables existing on-premises applications to be easily provisioned in the cloud, providing customers the benefit of scalability, elasticity, and shift of capital expenses to operational ones.

Kemp's Virtual LoadMaster (VLM) is a full-featured, advanced Layer 4-7 load balancer that supports a variety of workloads. Available in two versions, Bring Your Own License (BYOL) and the perpetual free license, the VLM provides the required throughput at the right price.

Along with advanced scheduling methods, intelligent traffic steering and support for multiple protocols, the VLM also provides Global Site Load Balancing (GSLB), RESTful, Python and PowerShell Application Program Interfaces (APIs).

In addition, the LoadMaster includes integration of the FIPS 140-2 certified encryption module, and supports security features such as access control lists, Web Application Firewall (WAF), Distributed Denial of Service (DDoS) protection, and multiple authentication methods, including: Kerberos Constrained Delegation (KCD), Department of Defense (DoD) Common Access Card (CAC) and Federal Personal Identity Verification (PIV) smart card, and Single Sign-On (SSO).

1 Introduction



Some of the features and associated benefits of the VLM are listed in the table below.

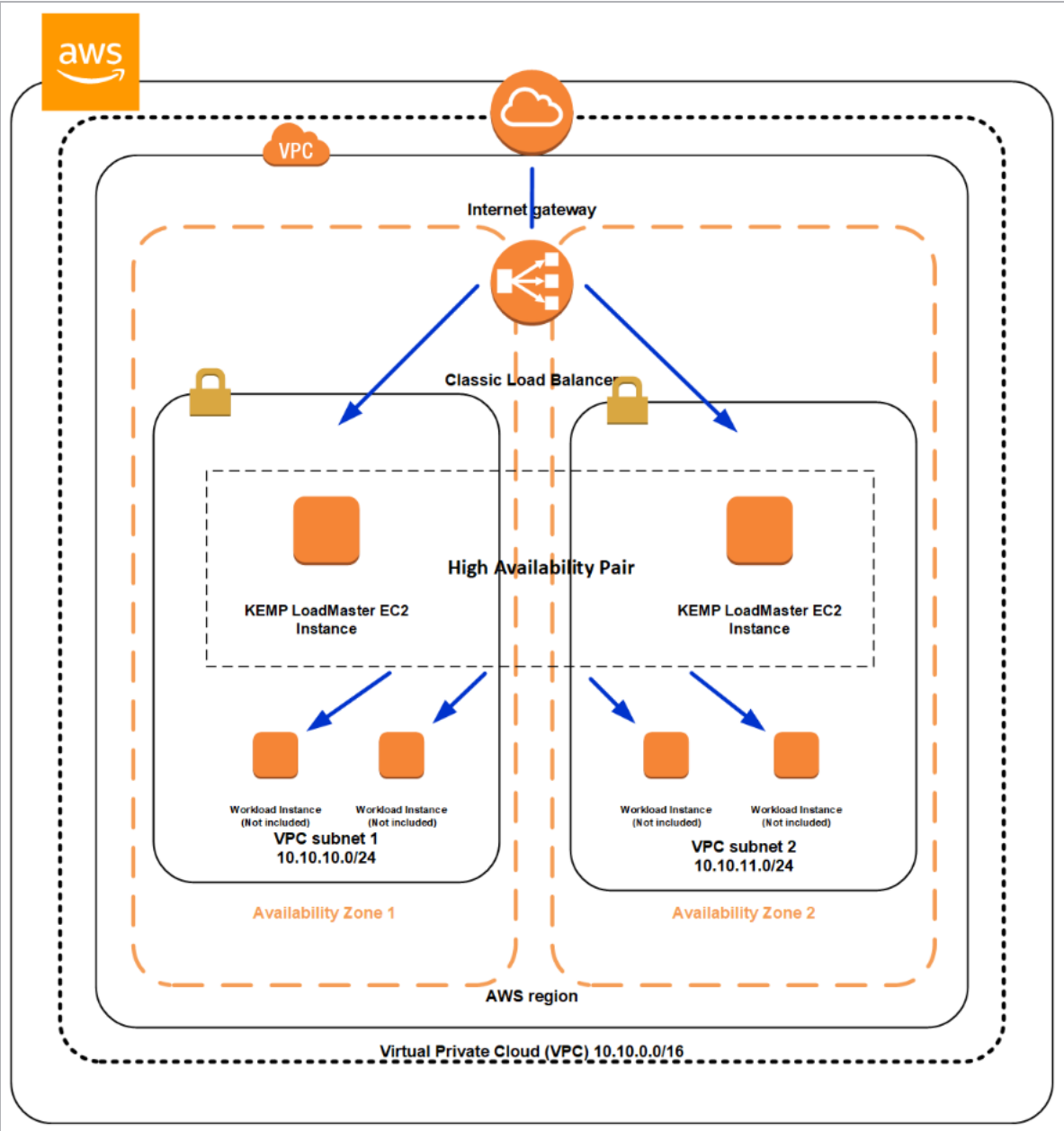
Feature	Benefit
Application ubiquity	Regardless of where the applications are deployed (cloud, on premises, or in hybrid environments) the VLM can load balance them.
Hybrid enhancement	The VLM manages applications deployed in hybrid infrastructures on premises and in the AWS GovCloud.
Scalable	Highly available ADCs, deployed on-demand to meet load requirements.
Resilient	VLM GEO load balancing supports application instances

Feature	Benefit
	across multiple sites to accommodate growth and deliver additional resilience.

1.1 Document Purpose

This document is intended to brief you on the LoadMaster for AWS GovCloud product and assist the reader to set up a basic LoadMaster for AWS GovCloud instance through the Marketplace.

It is also possible to configure the LoadMaster using Application Program Interface (API) commands. For further details, please refer to the Interface Description documents on the Kemp documentation page: <https://kemptechnologies.com/documentation>.



1.2 Intended Audience

This document is intended for anyone who is interested in finding out about the LoadMaster for AWS GovCloud product.

1.3 Prerequisites

There are some prerequisites to be aware of before following the steps in this document:

- Users should be familiar with the operation of AWS.
- If not already done, create a Kemp ID at the registration page:
<https://kemptechnologies.com/kemp-id-registration/>
- Users should have access and be logged-in to the AWS GovCloud Management Console.

2 LoadMaster for AWS GovCloud

2.1 Prerequisites

Some requirements to be aware of when deploying a LoadMaster in AWS GovCloud are below:

- Internet access in the Virtual Private Cloud (VPC) is required to license free and hourly-usage LoadMasters.
- Using Bring Your Own License (BYOL) licensing in an AWS VPC does work without internet access when using the private IP address but only if Offline Licensing is used during the deployment.
- Alternate default gateway support is not permitted in a cloud environment.
- If you want to enable 10 Gb throughput for a LoadMaster in AWS, you must select an AWS virtual machine (VM) instance type that supports the 10 Gb ENA driver. You can do this on initial install, or by moving to a new instance type after installation. The following AWS VM instance types support the 10 Gb ENA driver: A1, C5, C5d, C5n, F1, G3, H1, I3, I3en, m4.16xlarge, M5, M5a, M5ad, M5d, P2, P3, R4, R5, R5a, R5ad, R5d, T3, T3a, u-6tb1.metal, u-9tb1.metal, u-12tb1.metal, X1, X1e, and z1d. Refer to the [Supported Instance Types](#) AWS page for further details.

2.2 Differences from the Virtual LoadMaster (VLM)

First, the initial IP address that is obtained is assigned by AWS using Dynamic Host Configuration Protocol (DHCP). The LoadMaster obtains this address at instantiation and uses it as its interface address. This address is permanent for this instance and this private address is associated with a public IP address as well. Additional private addressing can be assigned according to your needs if you have additional private networks in AWS GovCloud.

In addition, a public address that maps to the private address is issued by AWS GovCloud. Unlike the private address, the public IP address can be changed by purchasing an Elastic IP.

For more information on Elastic IPs, refer to the [Amazon EC2 Elastic IP Addresses Feature Guide](#). Elastic IPs can be requested

by opening a Support case with AWS. Elastic IPs can be allocated in the AWS EC2 Console in **NETWORK & SECURITY > Elastic IPs**.

Interface IP addresses can be changed administratively as usual from the LoadMaster, but this requires an additional AWS configuration to prevent disconnection.

To preserve public ports, the Web User Interface (WUI) is available on port 8443 rather than 443. This allows port 443 to be used for a Virtual Service.

Due to AWS limitations, it is not possible to bond interfaces on AWS LoadMasters.

2.3 Licensing Options

There are three main licensing options when deploying a LoadMaster for AWS:

Hourly consumption (PAYG)

The hourly consumption option includes Enterprise Plus Support. You can find details on Kemp subscriptions at the following link: [LoadMaster Support Subscriptions](#).

BYOL

You must purchase a Standard, Enterprise, or Enterprise Plus subscription as part of the BYOL option.

Metered Enterprise Licensing Agreement (MELA)

Kemp MELA is a monthly subscription that allows for unlimited LoadMaster deployments and is billed based on aggregate consumption.

2.4 Security Best Practices

AWS has many security features to protect customers' cloud assets. This section outlines some security best practices pertaining to AWS. See the [AWS Security Best Practices Whitepaper](#) for further details.

If you already have an Identity and Access Management (IAM) role for administration of the Elastic Compute Cloud (EC2) and SSH key pair, you can skip to the **Start a New Instance** section.

2.4.1 IAM Service

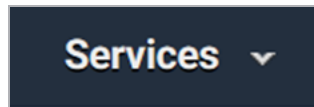
IAM is a centralized service that manages users, credentials, policies, and keys for the resources deployed in AWS. You should create individual accounts for each user that creates or accesses AWS resources. When possible, you should enable AWS Multi-Factor Authentication (MFA) for the IAM user account to further secure unauthorized access to assets running in the public cloud.

You should always leverage IAM Policies to assign permissions to IAM user accounts. You should scope these permissions with the least privilege security model by only permitting access based on users' job requirements.

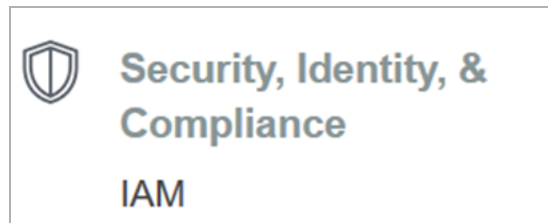
2.4.1.1 Create an IAM Policy

This section provides step-by-step instructions on creating an IAM Policy allowing an IAM user to create and manage EC2 Services:

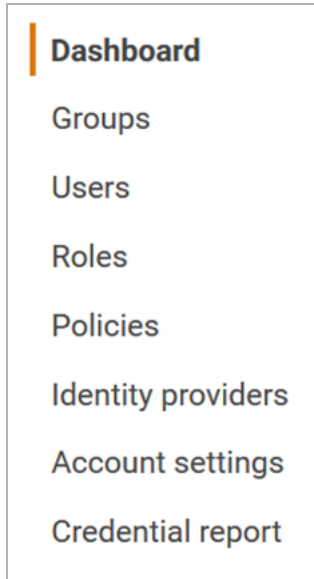
1. Log in to the AWS console.



2. Click **Services**.



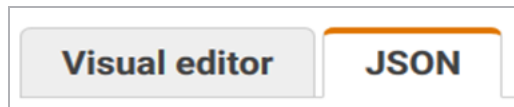
3. Under **Security, Identity, & Compliance**, select **IAM**.



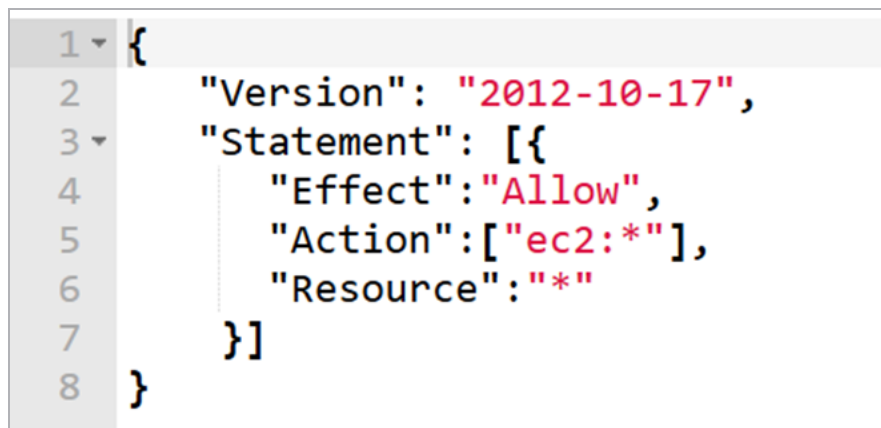
4. In the navigation on the left, click **Policies**.



5. Click **Create policy**.

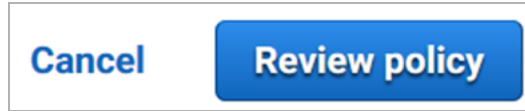


6. Select **JSON**.



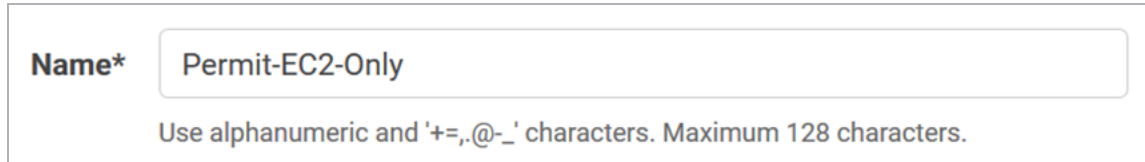
2 LoadMaster for AWS GovCloud

7. Enter the IAM Policy in the provided area. The text shown above is only an example. Policies created in AWS should be reviewed with your organization's security team.



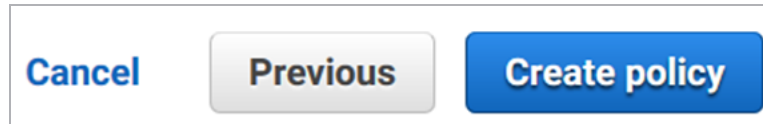
A rectangular container with a thin border. On the left is a blue button with the text "Cancel" in white. On the right is a blue button with the text "Review policy" in white.

8. Click **Review policy**.



A form element with a label "Name*" in bold. To its right is a text input field containing the text "Permit-EC2-Only". Below the input field is a small text hint: "Use alphanumeric and '+=, @-_' characters. Maximum 128 characters."

9. Enter a unique **Name**.



A horizontal row of three buttons. On the left is a blue button with the text "Cancel" in white. In the middle is a light gray button with the text "Previous" in dark gray. On the right is a blue button with the text "Create policy" in white.

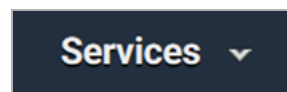
10. Click **Create policy**.

You can find further information on IAM Policies at the following link: [Policies and Permissions](#).

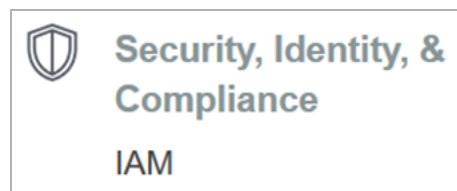
2.4.1.2 Assign an IAM Policy to an IAM User

This section provides step-by-step instructions on assigning an IAM Policy to an IAM user:

1. Log in to the AWS console.



2. Click **Services**.



3. Under **Security, Identity, & Compliance**, select **IAM**.

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Dashboard

Groups

Users

Roles

Policies

Identity providers


Account settings

Credential report

- 4. Select **Users**.
- 5. From the list of users, select the user to assign the policy to.

Add permissions

- 6. Click **Add permissions**.



Attach existing policies directly

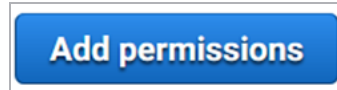
- 7. Click **Attach existing policies directly**.

Filter policies ▾		Q Permit		
		Policy name ▾	Type	Used as
<input checked="" type="checkbox"/>	▶	Permit-EC2-Only	Customer managed	None

- 8. Search for and select the IAM Policy to apply.

Next: Review

9. Click **Next: Review**.



10. Click **Add permissions**.

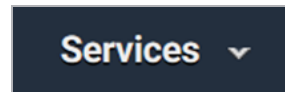
2.4.2 Access Keys

Access Keys are credentials for an IAM user that allow programmatic requests to the AWS Command Line Interface (CLI) or AWS Application Programming Interface (API). These keys consist of two parts; an access key ID and a secret access key. You should leverage multiple keys and use them across the different applications requiring access to AWS resources. In addition, you should rotate these keys regularly.

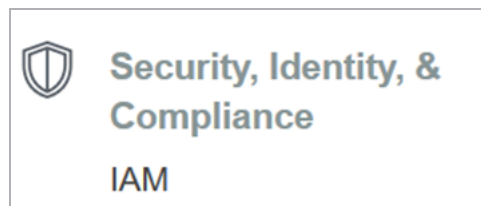
2.4.2.1 Rotate Access Key and Secret Key

This section provides step-by-step instructions for creating and rotating Access Keys and Secret Keys:

1. Log in to the AWS console.



2. Click **Services**.



3. Under **Security, Identity, & Compliance**, select **IAM**.

Dashboard

Groups

Users

Roles

Policies

Identity providers

Account settings

Credential report

- 4. Select **Users**.
- 5. From the list of users, select the user to manage.

Security credentials

- 6. Click **Security credentials**.

Create access key

- 7. Click **Create access key**.

Access key ID	Secret access key
<div></div>	***** Show

- 8. Copy the **Access key ID** and **Secret access key**.

Access key ID	Created	Last used
<div></div>	2018-12-03 14:13 EST	N/A

You can now use these keys in the application or direct access to the CLI or API. When viewing the Access Key, there is a **Last used** column. You can leverage this to ensure the Access Key is no longer in use and can be deleted as part of the key rotation schedule.

2.4.3 Storing Secrets

The handling and storing of secrets is a critical component of the overall security of the assets. AWS provides AWS Secrets Manager, which makes it easy to store and retrieve secrets. You should use the AWS Secrets Manager whenever possible to improve the overall security in AWS. For more information on AWS Secrets Manager, visit the following website: [AWS Secrets Manager: Store, Distribute, and Rotate Credentials Securely](#)

2.5 Create a New Key Pair

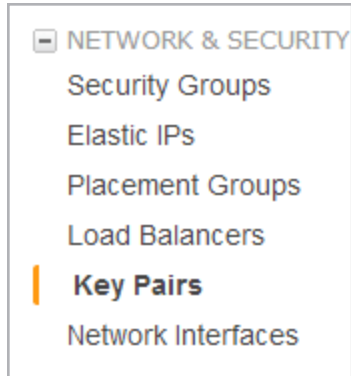
When starting a new instance in EC2, you are prompted to select a key pair. A key pair is a certificate and key. It is used to SSH to the LoadMaster and you must keep the downloaded key in a safe place. Steps on how to add a key pair are below:

1. Log in to the AWS console.

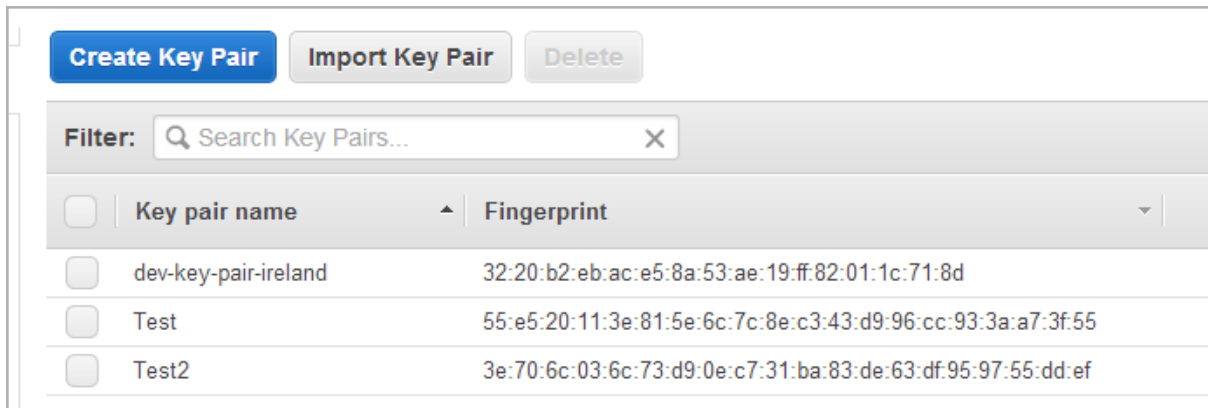


2. Click **EC2**.

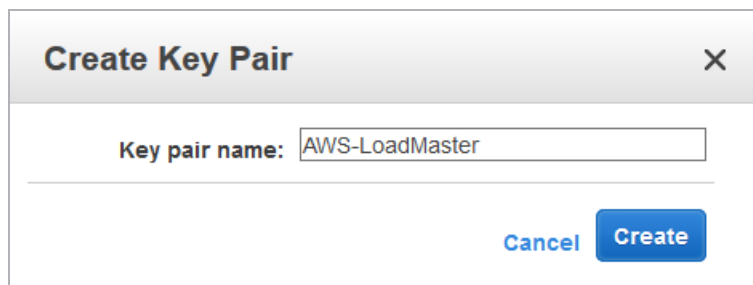
2 LoadMaster for AWS GovCloud



3. In the main menu, select **Key Pairs**.



4. Click **Create Key Pair**.



5. Enter a name for the key pair and click **Create**.

6. The .pem file will download.

This file is required to SSH into the LoadMaster so make a note of where this file is stored. This file needs to reside on the client

that is used to SSH to the LoadMaster.

If you are using a client that does not accept PEM format, you must convert the file to another format, for example PPK for Putty.

7. The permissions of the key pair file must be changed for it to work. To do this in Linux, go to the directory where the file is stored and run the following command:

```
chmod 600 <FileName>
```

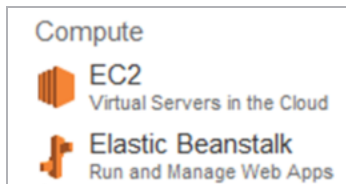
2.6 Start a New Instance

You can deploy new LoadMaster instances through the AWS Marketplace. For greater availability, Kemp recommends deploying a pair of Kemp LoadMasters in HA mode. For more information on deploying an HA pair, refer to the following feature guide: [HA for AWS Feature Description](#).

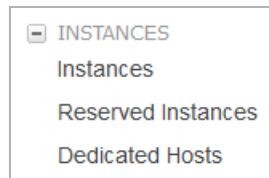
To start an instance, follow the steps below:

Note that it is also possible to deploy a LoadMaster using a different flow using the AWS Marketplace. Configure the same settings as outlined below, in particular – ensure to select a VPC as the network.

1. Log in to the [AWS](#) home page.

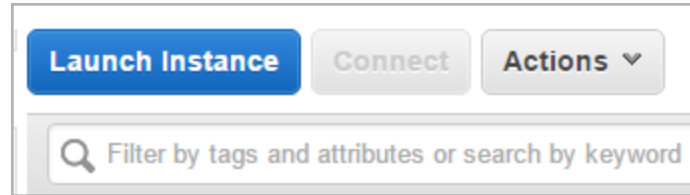


2. Click **EC2**.

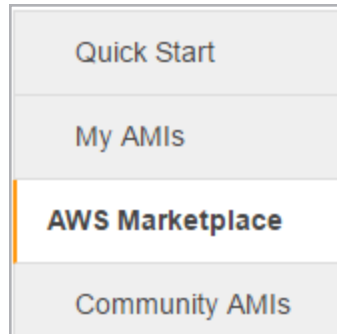


3. Click **Instances**.





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4. Click **Launch Instance**.



5. Select **AWS Marketplace**.

 Free Trial	<p>KEMP Load Balancer ADC - VLM-5000</p> <p>★★★★★ (0) 7.2.44.0 Previous versions By KEMP Technologies</p> <p>\$1.16/hr for software + AWS usage fees</p> <p>Linux/Unix, Other 3.1 64-bit Amazon Machine Image (AMI) Updated: 11/13/18</p> <p>The Virtual LoadMaster (VLM) Application Delivery Controller (ADC) complements applications deployed in the AWS cloud by providing comprehensive L7 traffic distribution with ...</p> <p>More info</p>
 Free Trial	<p>KEMP Load Balancer ADC - VLM-3000</p> <p>★★★★★ (0) 7.2.44.0 Previous versions By KEMP Technologies</p> <p>\$0.70/hr for software + AWS usage fees</p> <p>Linux/Unix, Other 3.1 64-bit Amazon Machine Image (AMI) Updated: 11/12/18</p> <p>KEMP's Virtual LoadMaster (VLM) in AWS Cloud enhances application performance with comprehensive L7 traffic distribution, session persistence, application health checking, content ...</p> <p>More info</p>
 Free Trial	<p>KEMP Load Balancer ADC - VLM-10G</p> <p>★★★★★ (0) 7.2.44.0 Previous versions By KEMP Technologies</p> <p>\$1.99/hr for software + AWS usage fees</p> <p>Linux/Unix, Other 3.1 64-bit Amazon Machine Image (AMI) Updated: 11/12/18</p> <p>The Virtual LoadMaster (VLM) Application Delivery Controller (ADC) complements applications deployed in the AWS cloud by providing comprehensive L7 traffic distribution with ...</p> <p>More info</p>
 Free Trial	<p>KEMP WAF Load Balancer ADC - VLM-500</p> <p>★★★★★ (0) 7.2.44.0 Previous versions By KEMP Technologies</p> <p>\$0.54/hr for software + AWS usage fees</p> <p>Linux/Unix, Other 3.1 64-bit Amazon Machine Image (AMI) Updated: 11/12/18</p> <p>KEMP's Virtual LoadMaster (VLM) in AWS Cloud enhances application performance with comprehensive L7 traffic distribution, session persistence, application health checking, content ...</p> <p>More info</p>

6. Search for Virtual LoadMaster.

7. Click **Select** for the relevant version to be deployed.

2 LoadMaster for AWS GovCloud

8. If you select an hourly licensing model, click **Continue** to proceed.

Filter by: All instance types Current generation Show/Hide Columns				
Currently selected: m4.2xlarge (26 ECUs, 8 vCPUs, 2.4 GHz, Intel Xeon E5-2676v3, 32 GiB memory, EBS only)				
	Family	Type	vCPUs ⓘ	Memory (GiB)
<input type="radio"/>	General purpose	t2.nano	1	0.5
<input type="radio"/>	General purpose	t2.micro Free tier eligible	1	1
<input type="radio"/>	General purpose	t2.small	1	2
<input type="radio"/>	General purpose	t2.medium	2	4
<input type="radio"/>	General purpose	t2.large	2	8
<input type="radio"/>	General purpose	t2.xlarge	4	16
<input type="radio"/>	General purpose	t2.2xlarge	8	32
<input type="radio"/>	General purpose	m4.large	2	8
<input type="radio"/>	General purpose	m4.xlarge	4	16
<input checked="" type="checkbox"/>	General purpose	m4.2xlarge	8	32
<input type="checkbox"/>	General purpose	m4.4xlarge	16	64

9. Select the desired **Instance Type**.

Use the following LoadMaster sizing table as a reference only because some workloads may require more vCPU or memory than others:

LoadMaster	Instance Type
VLM-200	m4.large
VLM-3000	m4x.large
VLM-5000	m4.2xlarge
VLM-10G	m4.4xlarge

For further information on instance types, refer to the following Amazon link: [Amazon EC2 Instance Types](#).

Cancel
Previous
Review and Launch
Next: Configure Instance Details

If you want to enable 10 Gb throughput for a LoadMaster in AWS, you must select an AWS VM instance type that supports the 10 Gb ENA driver. You can do this on initial install, or by moving to a new instance type after installation. The following AWS VM instance types support the 10 Gb ENA driver: A1, C5, C5d, C5n, F1, G3, H1, I3, I3en, m4.16xlarge, M5, M5a, M5ad, M5d, P2, P3, R4, R5, R5a, R5ad, R5d, T3, T3a, u-6tb1.metal, u-9tb1.metal, u-12tb1.metal, X1, X1e, and z1d. For more information, refer to the **Enable a 10 Gb Interface** section.

10. Click **Next: Configure Instance Details**.

Number of instances	<input type="text" value="1"/>	
Network	<input type="text" value="vpc-06a94f63 (default)"/>	Create new VPC
Subnet	<input type="text" value="subnet-422aed27 Default in us-gov-west-1b"/> 4090 IP Addresses available	Create new subnet
Auto-assign Public IP	<input type="text" value="Use subnet setting (Enable)"/>	
Placement group	<input type="text" value="No placement group"/>	
IAM role	<input type="text" value="None"/>	Create new IAM role
Shutdown behavior	<input type="text" value="Stop"/>	
Enable termination protection	<input type="checkbox"/> Protect against accidental termination	
Monitoring	<input type="checkbox"/> Enable CloudWatch detailed monitoring Additional charges apply.	
EBS-optimized instance	<input checked="" type="checkbox"/> Launch as EBS-optimized instance	
Tenancy	<input type="text" value="Shared - Run a shared hardware instance"/> Additional charges will apply for dedicated tenancy.	

11. Ensure to select the correct item (a VPC) in the **Network** drop-down list.

If multiple LoadMasters on multiple networks are needed, choose the different networks as required. If more networks need to be created, contact your AWS administrator to add

them. The **Create new VPC** link can be used to add more networks if needed.

12. Ensure that the **Auto-assign Public IP** option is set to **Enable**.
13. Configure any other setting as needed.

Cancel
Previous
Review and Launch
Next: Add Storage

14. Click **Review and Launch**.

Boot from General Purpose (SSD)
×

General Purpose (SSD) volumes provide the ability to burst to 3000 IOPS per volume, independent of volume size, to meet the performance needs of most applications and also deliver a consistent baseline of 3 IOPS/GiB.

- ☒ Make General Purpose (SSD) the default boot volume for all instance launches from the console going forward (recommended).
- ☐ Make General Purpose (SSD) the boot volume for this instance.
- ☐ Continue with Magnetic as the boot volume for this instance.

Free tier eligible customers can get up to 30GB of General Purpose (SSD) storage.

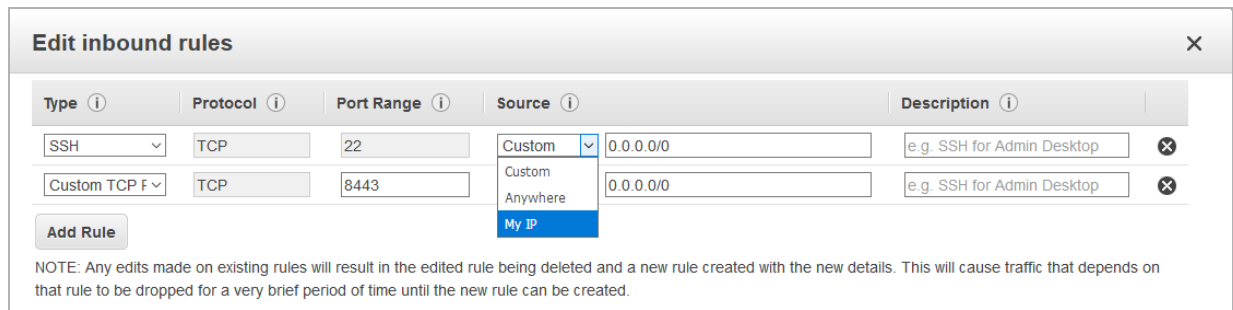
Next

15. Select the relevant option on the **Boot from General Purpose (SSD)** screen and click **Next: Add Tags**.

Key (127 characters maximum)	Value (255 characters maximum)
Name	KEMP-LoadMaster

AWS tags allow you to categorize resources in different ways. You can categorize by application, owner, purpose, or any custom tag.

16. Enter tags.
17. Before launching, click **Edit security groups**.
18. Select the security group of your choosing or create a new security group.



Type	Protocol	Port Range	Source	Description
SSH	TCP	22	Custom	e.g. SSH for Admin Desktop
Custom TCP F	TCP	8443	Custom	e.g. SSH for Admin Desktop

NOTE: Any edits made on existing rules will result in the edited rule being deleted and a new rule created with the new details. This will cause traffic that depends on that rule to be dropped for a very brief period of time until the new rule can be created.

a) The following rules are needed in the security group:

- Custom TCP Rule with the Port Range 8443 for the WUI
- **SSH** for the SSH management interface
- Any additional rules that are needed for other ports for services to be load balanced, for example Remote Desktop Protocol (**RDP**) if load balancing Windows RDP servers, or **HTTPS** for a secure website

Do not block port 6973. This port is used for synchronization when using the LoadMaster in a HA configuration.

Select the relevant source option from the drop-down list and enter the custom IP addresses as needed.

19. It is recommended that management services only be allowed using trusted IP addresses. You should also add rules for any services you intend on creating. You can always revisit this security group later if additional services become necessary.
20. Click **Review and Launch**.
21. Click **Launch**.

Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMLs, the private key file is required to obtain the password used to log into your instance. For Linux AMLs, the private key file allows you to securely SSH into your instance.

Choose an existing key pair

Select a key pair

aws-ec2

☒ I acknowledge that I have access to the selected private key file (aws-ec2.pem), and that without this file, I won't be able to log into my instance.

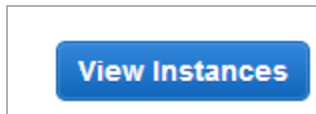
Cancel

Launch Instances

22. Select the appropriate key pair for your environment. This is the key pair that was created in the **Create a New Key Pair** section. This key pair is needed to connect using SSH.

23. Select the check box.

24. Click **Launch Instances**.

A blue button with the text "View Instances" in white, centered within a light gray rectangular border.

25. Click **View Instances**. The **Public IP** address or **Public DNS** address can be used to connect to the instance using HTTPS on port 8443.

26. After your instance state is **Running**, you can connect to your LoadMaster instance.

2.7 Enable a 10 Gb Interface

Virtual LoadMasters deployed within the AWS Cloud now support 10 Gb interfaces. This support comes with the following limitations:

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- No speed is displayed when it cannot be read from the interface.
- The speed displayed behaves similar to bonded interfaces in that the speed of the aggregate of the number of separate logical interfaces that have been defined on that interface is displayed.
- Interface graphs for 10 Gb interfaces on the **Statistics** page may be displayed incorrectly. This will be addressed in a future release.

If you upgrade from a release prior to 7.2.48 to 7.2.48 or a later release and your AWS VM is running a VM instance type that does not support 10 Gb interfaces (for example, m4.10xlarge), you must convert the VM to a machine type that supports 10 Gb interfaces (for example, m4.16xlarge).

To enable 10 Gb interfaces on the LoadMaster, perform the following steps:

1. Shut down the LoadMaster using the LMOS WUI or API.
2. Enable ENA driver support on the AWS VM using the following command:

```
aws ec2 modify-instance-attribute --instance-id instanceID --ena-support
```

The **Instance ID** can be found in the AWS **EC2 Dashboard** by selecting **Instances** within the **INSTANCES** section of the main menu.

3. Change the AWS VM instance type to one that supports the ENA 10 Gb driver (for example, m4.16xlarge) using the AWS UI.
4. Start the LoadMaster VM.

For further details on this, refer to the AWS document on [Enabling Enhanced Networking with the Elastic Network Adapter \(ENA\) on Linux Instances](#).

For details on how to get started with AWS command line, refer to the following AWS documentation:

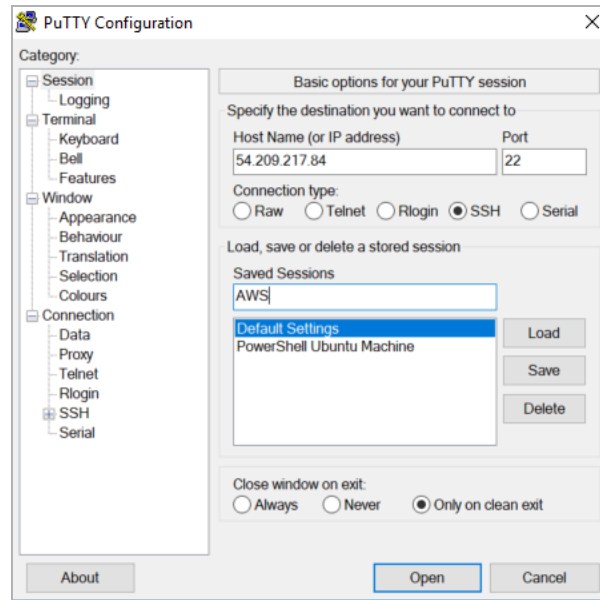
- [What is the AWS Command Line Interface?](#)
- [Installing the AWS CLI](#)

2.8 Initial Setup – Hourly Licensing

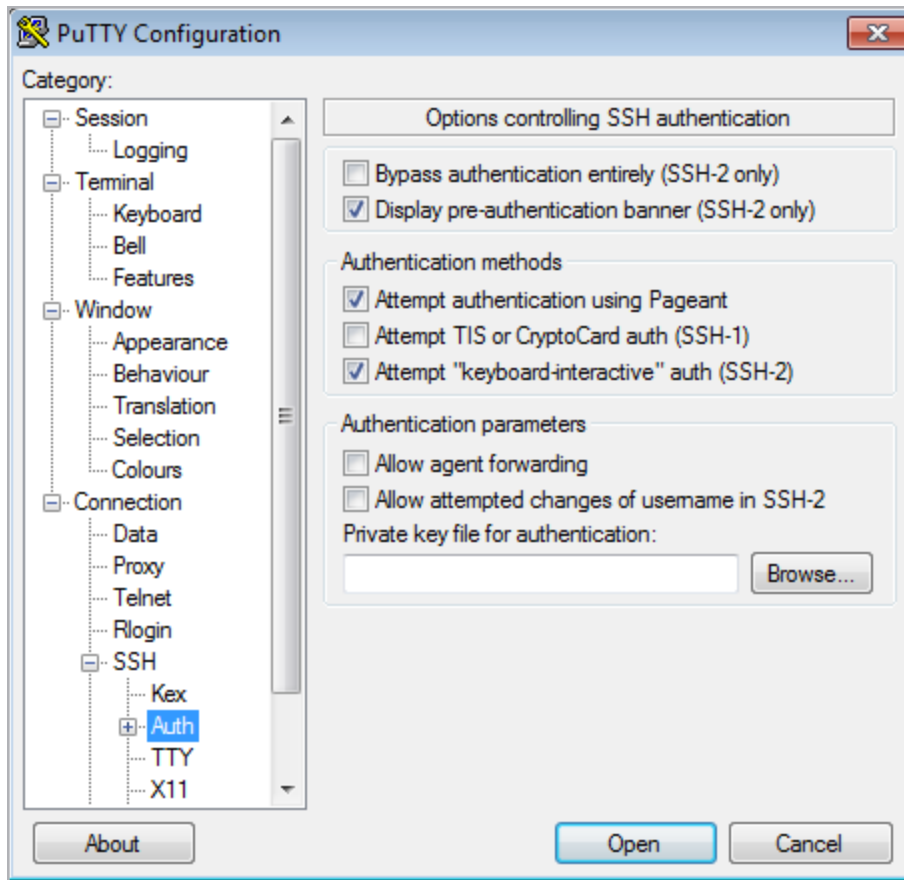
If you chose an hourly licensing method - after the instance is launched, you must first access the LoadMaster using SSH with the required key pair to enable WUI access. The example steps below use PuTTY as the SSH client.

2 LoadMaster for AWS GovCloud

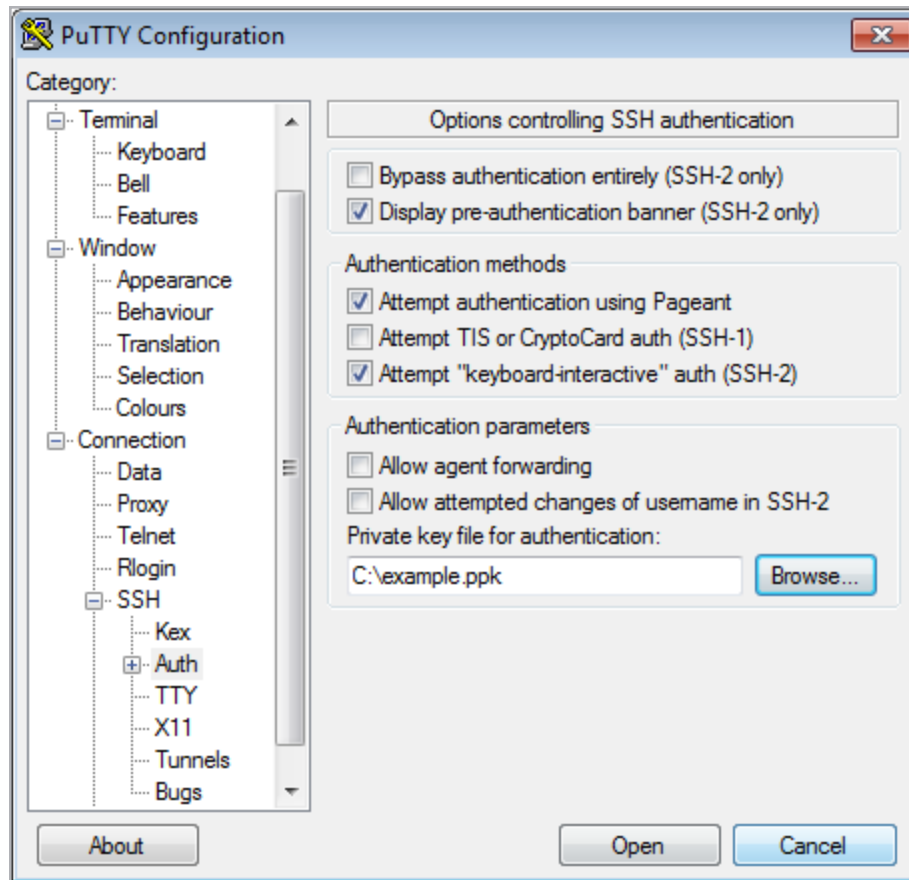
1. Open the PuTTY client.



2. Enter the **IP address** of the LoadMaster instance. This is the IP address obtained in the **Start a New Instance** section.
3. In the main menu, navigate to **Connection > SSH > Auth**.



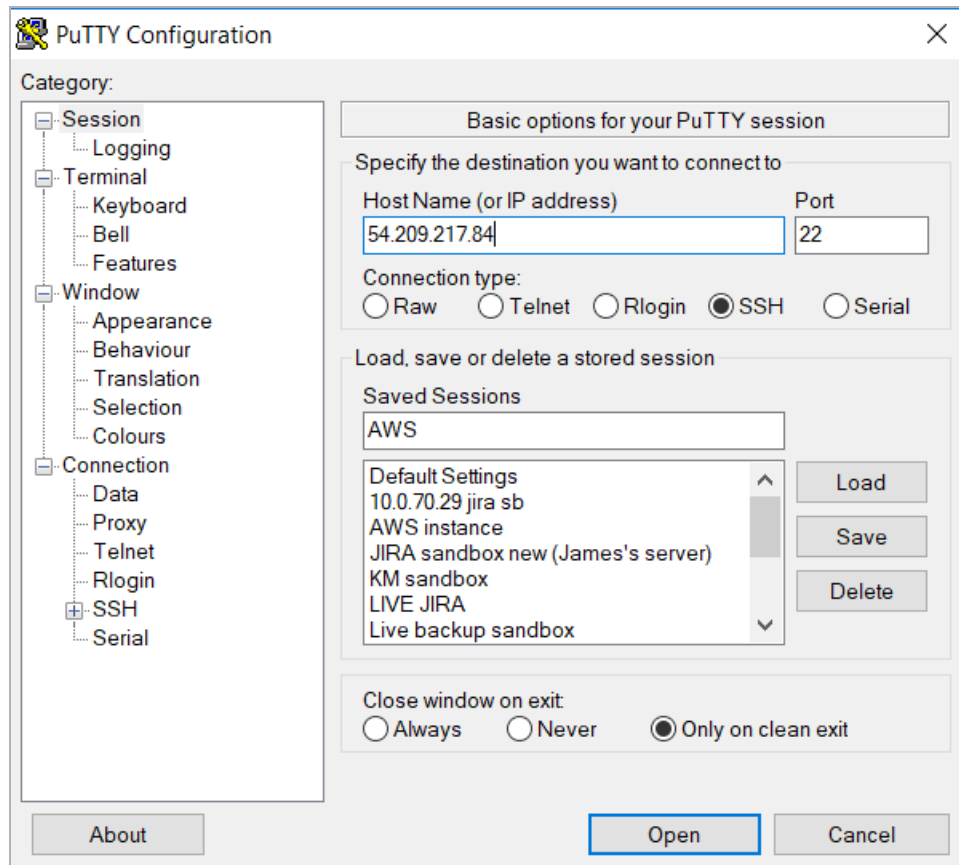
4. Click **Browse**.



5. Navigate to and select the key pair file that was exported in the **Licensing Options** section.

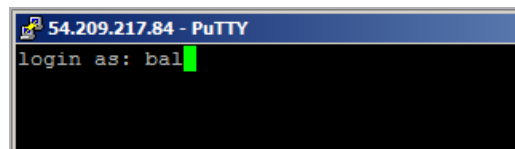
If you are using a client that does not accept PEM you must convert the key pair file to another format, for example PPK for Putty. For instructions on how to do this, refer to the following TechRepublic article: [Connect to Amazon EC2 with a private key using PuTTY and Pageant](#).

2 LoadMaster for AWS GovCloud

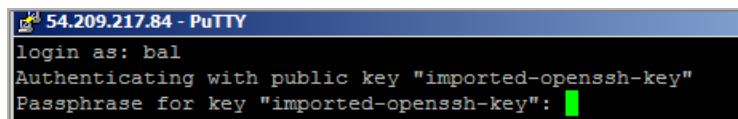


6. If desired, you can save the settings so that you do not have to perform these steps each time you open a Putty session for this IP address. To do this, enter a name in the **Saved Sessions** text box and click **Save**.

7. Click **Open**.



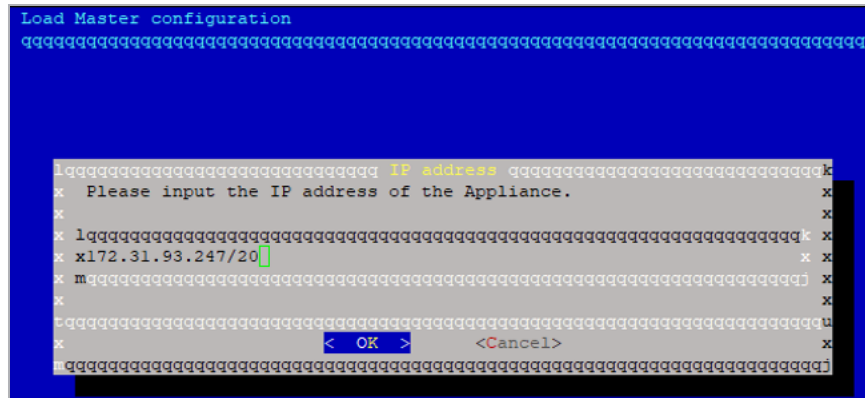
8. Log in with the username **bal**. This is the default LoadMaster username.



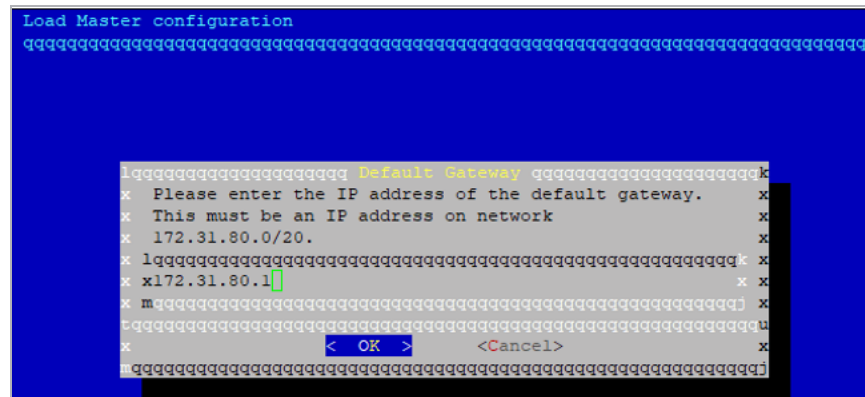
9. Enter the passphrase if you specified one to be used for the private key.

2 LoadMaster for AWS GovCloud

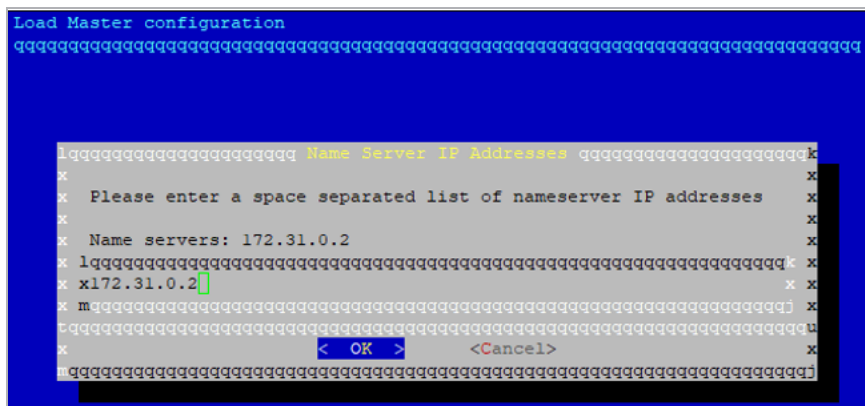
10. A number of screens appear relating to configuring various network options. These can be left as the default values but can be changed if needed. Press **OK** on each screen to proceed:



a) A screen appears relating to the IP address.

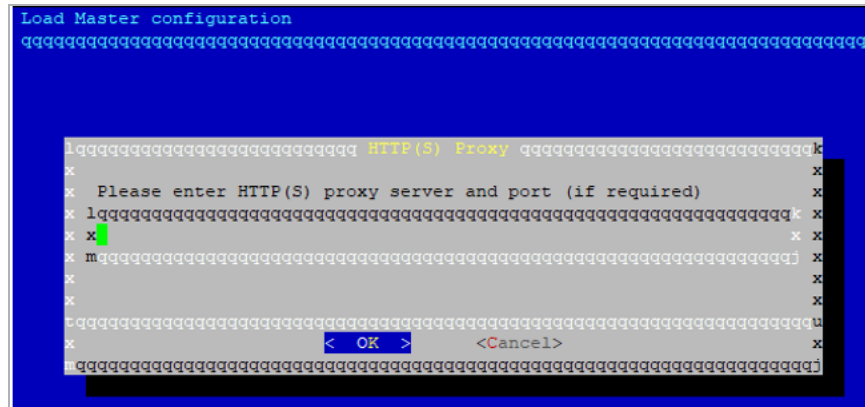


b) The IP address for the default gateway should only be changed if you have an alternative gateway configured.



2 LoadMaster for AWS GovCloud

c) The default name server appears. You can optionally change this to an alternative name server if required.



d) Leave this option blank unless your environment requires a proxy server to access the internet.

<input type="checkbox"/>	Name	 Instance ID	Instance Type
<input type="checkbox"/>	ExampleInstance	i-14fece3f	t1.micro

11. If you selected an hourly licensing model, you are asked to enter the current LoadMaster password. By default, the password is set to the **Instance ID** which can be found in the AWS **EC2 Dashboard** by selecting **Instances** within the **INSTANCES** section of the main menu. Enter and confirm the new password.

The password must be reset to access the LoadMaster WUI. If you enter an incorrect password, you must restart SSH and go through the setup again.

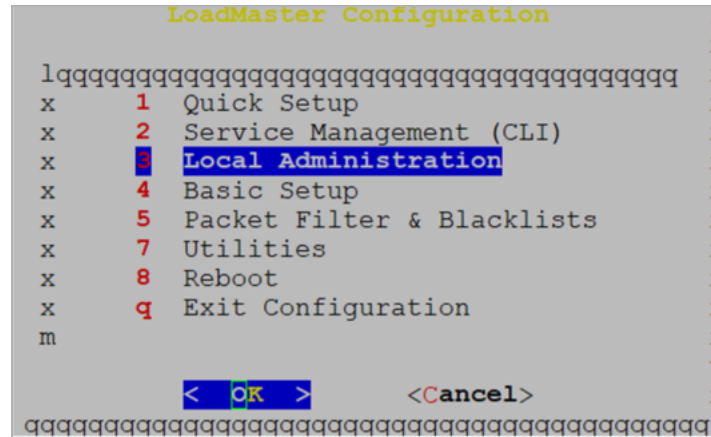
12. Log in with the new password.

13. Connect to the LoadMaster using a browser by entering **https://InstanceAddress:8443** in the address bar to continue configuration. The instance address can be the public IP address or the public DNS, both of which can be found in the EC2 Console in the **Description** tab.

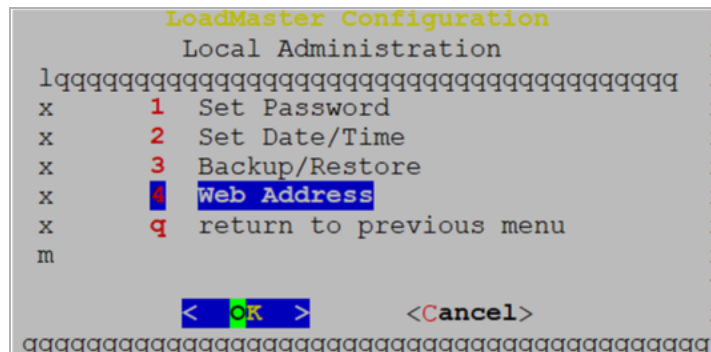
If the first attempt to reset the password fails or if the WUI is not accessible, follow the steps in the **Restart Web Server Access - Hourly Licensing** section.

2.8.1 Restart Web Server Access - Hourly Licensing

If the first attempt to reset the password fails or if the WUI is not accessible, follow the steps below. The existing SSH session can be used, or a new SSH session can be opened using **bal** and the new password created in the **Initial Setup – Hourly Licensing** section.



1. On the main menu, select **Local Administration**.



2. Select **Web Address**.

```

lqqqqqqqqqqqqqqqqqqqqqqqqqqqq Web server address qqqqqqqqqqqqqqqqqqqqqqqqqqqk
x  Web server is listening on                                     x
x  https://172.31.93.247:8443                                     x
x  Please select which address to use                             x
x  lqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqk x
x x      l  Use 172.31.93.247:8443                                x x
x x      p  Change Server Port                                   x x
x x      s  Immediately Stop Web Server Access                  x x
x x      r  Regenerate Web Server SSL Keys                      x x
x x      q  return to previous menu                             x x
tqmqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqj qu
x                                     < OK >                     <Cancel>                               x
mqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqjj

```

3. Select **Immediately Stop Web Server Access**.

```

lqqqqqqqqqqqqqqqqqqqqqqqqqqqq Web server address qqqqqqqqqqqqqqqqqqqqqqqqqqqk
x  Web server is not currently listening                           x
x                                                                    x
x                                                                    x
x  lqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqk x
x x      l  Use 172.31.93.247:8443                                x x
x x      p  Change Server Port                                   x x
x x      s  Immediately Start Web Server Access                  x x
x x      r  Regenerate Web Server SSL Keys                      x x
x x      q  return to previous menu                             x x
tqmqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqj qu
x                                     < OK >                     <Cancel>                               x
mqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqjj

```

4. Select **Immediately Start Web Server Access**.

5. Connect to the LoadMaster using a browser by entering **https://InstanceAddress:8443** in the address bar to continue configuration. The instance address can be the public IP address or the public DNS, both of which can be found in the EC2 console in the **Description** tab.

2.8.2 Initial Configuration – Hourly Licensing

If you chose an hourly licensing model, follow the steps below to initially set up the LoadMaster:

1. Open the VLM in a web browser by entering **https://InstanceAddress:8443** in the address bar. The instance address can be the public IP address or the public DNS, both of which can be found in the EC2 Console in the **Description** tab.
2. Acknowledge the self-signed certificate to proceed.

The certificate used by the WUI takes the public name used by AWS.

3. Accept the End User License Agreement (EULA).
4. A screen appears asking if you are OK with the LoadMaster regularly contacting Kemp to check for updates and other information. Click the relevant button to proceed.

A prompt appears asking for the username and password. Enter **bal** as the username and the password that was set previously. The LoadMaster is now licensed and is ready for administration and configuration.

2.9 Initial Setup – BYOL

When using the BYOL method, the normal LoadMaster licensing and activation process is used. Access the LoadMaster using the WUI by entering the Public Address, preceded with **https://** and followed by **:8443**. Then, proceed through the steps and license the LoadMaster.

To use the BYOL option, follow the steps below:

1. Deploy the **BYOL – Trial and perpetual license** version of the VLM (follow the steps in the **Start a New Instance** section).
2. When the LoadMaster deploys successfully, connect to the LoadMaster WUI, for example, **https://52.45.31.111:8443**.
3. Acknowledge the self-signed certificate to proceed.
4. Accept the EULA.
5. Enter your Kemp ID and password to obtain a trial license. If you have an Order ID#, enter it now to apply the purchased license. If you do not have an Order ID#, you can proceed with these steps and then enter an Order ID# later after contacting a Kemp representative to purchase a license (see steps below).
6. Select your license and click **Continue**.

2 LoadMaster for AWS GovCloud

7. A screen appears asking if you are OK with the LoadMaster regularly contacting Kemp to check for updates and other information. Click the relevant button to proceed.

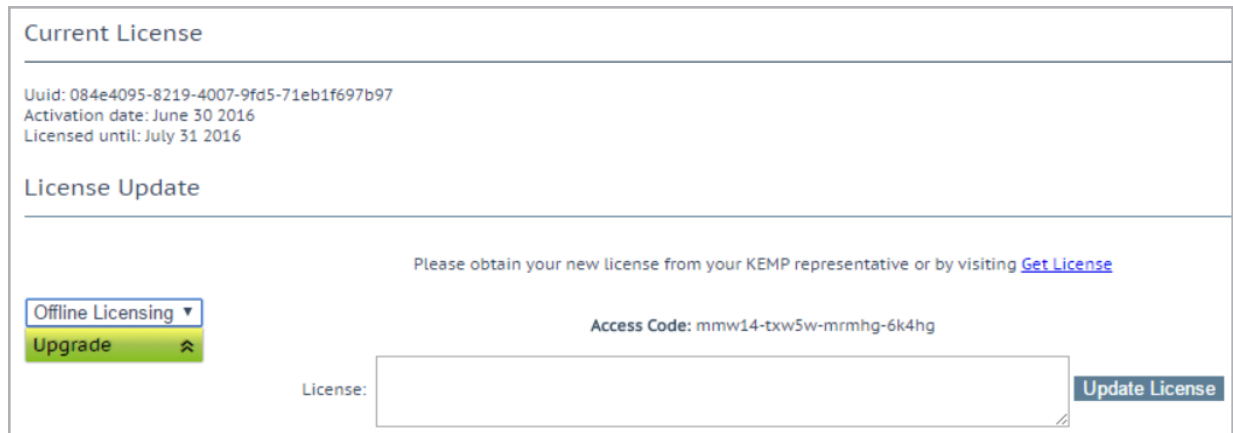
8. Enter a new password for the default **bal** account and click **Set password**.

If you did not enter the Order ID# during the initial configuration, follow the steps below to license the LoadMaster:

1. Contact a Kemp representative to get a license.
2. Log in to the LoadMaster WUI and navigate to **System Configuration > System Administration > Update License**.
3. Enter your Kemp ID and Password to update the license.

Kemp recommends rebooting after updating the license.

For AWS GovCloud, use offline licensing.



The screenshot shows the 'Current License' section with the following details:

- Uuid: 084e4095-8219-4007-9fd5-71eb1f697b97
- Activation date: June 30 2016
- Licensed until: July 31 2016

The 'License Update' section contains the following elements:

- A message: "Please obtain your new license from your KEMP representative or by visiting [Get License](#)"
- A dropdown menu labeled "Offline Licensing" with a downward arrow.
- A green "Upgrade" button with an upward arrow.
- An "Access Code" field containing the text: "mmw14-txw5w-mrmhg-6k4hg"
- A "License:" label followed by a large text input field.
- An "Update License" button.

To upgrade the license using the offline method, you must enter the license text in the LoadMaster. You can either get this from Kemp or by using the **Get License** link.

To get the license text using the **Get License** link:

4. Click the **Get License** link.

Offline Licensing

Select your LoadMaster's platform type:

Cloud LoadMaster

Choose your LoadMaster license:

AWS BYOL

Do you have a purchase order?

No

LoadMaster access code:

Firmware version:

Choose firmware version...

KEMP ID:

Password:

GENERATE LICENSE

5. Click **GENERATE LICENSE**.

2 LoadMaster for AWS GovCloud

Offline Licensing

The licensing process for Loadmaster **Serial No. TSBE04013083** has finished successfully. You should receive an email with your license details shortly.

Click [here](#) to copy to your clipboard

```
begin 0 /dev/null
hYE4t3iNKfk+sBaInAHZZC0omAa2r9HEqNK2hCHInNGphMaInNK6lMnZZAKE+
h+++++
h+560+++++fp0F+PYKtU1WcP3MXhQNr+mPbZ+djrBqubrhtqcPz8x3uHTu
hmYUom8N10FvQ5xcvL6h0cSRi+PN5b9AB905G9j9ocFVCcpCVS8hfyIJw01A2
hE9Z5PgDo4UK76a6M2lXoQwIw9UMkwfAfqkXeU0pxSdoFU0z7ECmdKcJtBk5B
hYpuEIKLc0f2CUChweHfQTVncGb1QPku7uXJsreUUFhG2DEdtIcdWm86FM8G4
h9sjIj0ytc3CFTqNVBExAkfHDkkVBs5yVEdzYeyZWJCoMhGhLZPPomMFb+prp
hFwEBs0E8NfzN+a9k4hLET1D95m1JesxulLaCxI0Am4GsHGTwyPk8nbuYIS0Z
hmcEf0PNWaxvqCdbeKIR1ZmZzIGorvK8W34D3H7uIB5q-208phbVilTPq3C+-
hxYSZmDsZPwL-qizw0AzsADyPYPYl9FzNoeIzTnFDV4--wE7dcIoC+BXqSJ-7
hJCNt8E45+SeCEm3mRGEt40zoN3Fjw8kAdvFIIdHgBgYCLjpGH0pgTwI80v8bz
hwWCi7e6IEscMwxi0s0N-bwLFLZnAisrYfZETztCULy3j+P2j8NhX2ZfqRy1
hhhjKcsyehG5fk+V9gM+ZJ-XsLqfyJuv02y0WVHZgjzb8M5h9NRRQzDwNrjU
hCLjpnreDmzt9UHXlu4YYzbF2tdkVvxP95ZxrIqT8Ec0Coabhbq+-vzjmY9fI
hjVDco8iVc3osKF4efmU9P42B9qMnKXREpLnprMkJdHlqkY9pm+0gLNi0bCc
hKy4fq09sIm+acpKC4fgYDwKZF6hbWgNn7HDSH+QK014ZCVjd3cgJ5-rcL1hQ
BG06+qtNWvZB7AA+ksU++
+
end
```

6. A page displays showing the license text. Click the **here** link to copy the license text.
7. Open the email and copy the text, from the start of the word **begin** to the end of the word **end**.
8. Open the LoadMaster.

License:

```

begin 0 /dev/null
hYE4t3iNKfk+sA4JYC4AkBwPwMKEk9HEsNH0hMKBYNGpaBKA+AX2nCK2kBXA+
h+++++
h+++++
h+1+0+++++fp0F+PYKtU1einr-6lM6Y0E049pEpKh01SC0muUEqSQksS+x
he9aavotd777SA2FqCtGvZEFsOUICEEWFbOq0hfW1Wd0dUeT231jRnAJVctrP
hy5VPPQdIr7HaIXsd9u4mTWpLDrBtL+zwEOHs1+jZwE4q8H0JGw2PiQ9enwW
hZmKyXZWHE-gCd18dyIgIUJMr-iTUNucAFONlTGQcX+av0J1OAPhBGwGDGiKE
hlu4At49sAY12ckeAzkTeS4WNa1gGkohu5CgphJiXFd5204Bvt7SNKmh9jPK-
hZBieKJaxh6cDca0oI1+a0JGgn57AzT91ymIm7lwpA0qDUCqixMV+0ygiPfDP
hetxPB2DRBkiX803Kx5L9pzHq2U10kYf1rAH6shw1WMkC4ZhHKDF7pCzsLA5A
h5vU9TxHJmt1w+iNAi+IbuJVstwtelFElpRhnsGDBsu7v0j983mMS8q+170E
hrtfzm5QcUFE9gTWA8iYvtchtDT6KaCrxdgrTM9mPJwCz0wsFJMndHdaD1rif
hmp82pK+aD64Vm6sz0RZXWzaBTCOLNfQdndkX0inaxp8EbzM9ef0jCYiDKn
h7Q1fsq07nGgTGsu4ik2bL-oTDZPb0i70ZF+0Qs5Un5iWAFpsuU3DP+3QTSVp
h9dUE64e2KGG80SY40VPi61fn4AWChvG3se64wAd0CpauyPMho+hcZqOPgjaZ

```

Update License

9. Paste the license into the box provided.
10. Click **Update License**. Kemp recommends rebooting after updating the license.

2.10 Create a Virtual Service

To create a Virtual Service, follow the steps below in the LoadMaster WUI:

1. In the main menu, select **Virtual Services** and **Add New**.

Please Specify the Parameters for the Virtual Service.

Virtual Address	<input style="width: 80%;" type="text" value="10.11.0.151"/>
Port	<input style="width: 80%;" type="text" value="80"/>
Service Name (Optional)	<input style="width: 80%;" type="text" value="test"/>
Protocol	<input style="width: 80%;" type="text" value="tcp"/>

Cancel

Add this Virtual Service

2. Enter the private address of the LoadMaster instance in the **Virtual Address** text box.
3. Enter the relevant **Port**, which was permitted in the Security Group.
4. Enter a recognizable **Service Name**.
5. Select the relevant **Protocol**.
6. Click **Add this Virtual Service**.
7. Configure the settings for the Virtual Service as needed, for example:

a) To enable SSL acceleration, select the **Enabled** check box in the **SSL Properties** section. For more information on SSL offloading, refer to the [SSL Accelerated Services, Feature Description](#).

b) To enable ESP, select the **Enable ESP** check box in the **ESP Options** section. For more information on how to configure the ESP options, refer to the [ESP, Feature Description](#).

c) To enable the Web Application Firewall (WAF), select the **Enabled** check box in the **WAF Options** section. For more information on how to configure the WAF options, refer to the [Kemp Web Application Firewall, Feature Description](#).

8. Add Real Servers in the **Real Servers** section.

2.11 Activate your Support Subscription

If you are using a Pay Per Use (Hourly Usage) LoadMaster, three days after initially setting up the LoadMaster, a prompt appears asking you to activate your support subscription. Enter your **Kemp ID** and **Password** and click **Update License** to do this.

Thank you for activating your Virtual LoadMaster for AWS instance.
In order to activate your included support subscription, please enter your KEMP ID.
If you do not have a KEMP ID, click [here](#) to create one and return to this page.

Current License

Uuid: 8e569aeb-8f92-41f5-b33b-ce4aaf3d2b85
Activation date: September 09 2016
Licensed until: Unlimited

License Update

Online Licensing ▾
Upgrade ⬆

KEMP Identifier:
Password:

Update License

Cancel

You can activate your support subscription before three days by expanding **System Configuration > System Administration**, clicking the **Update License** option and filling in your Kemp ID and password.

Kemp recommends rebooting the LoadMaster after updating the license.

3 LoadMaster Firmware Downgrades

It is best practice to keep the Kemp LoadMaster firmware at the latest version. In the event an issue occurs after an upgrade to the latest firmware version, the system can be rolled back to the previous version.

You can find steps for upgrading/downgrading the LoadMaster firmware at the following link:

[Updating the LoadMaster Software](#)

Do not downgrade from firmware version 7.2.36 or higher to a version below 7.2.36. If you do this, the LoadMaster becomes inaccessible and you cannot recover it.

4 LoadMaster Backup and Restore

Kemp provides several methods to backup and restore configuration and certificates on the LoadMaster. Depending on the Recovery Point Objective (RPO) and Recovery Time Objective (RTO), you can take these backups manually or automatically on a daily or weekly schedule. For information on the backup and restore features, refer to this Technical Note: [Backup and Restore Technical Note](#)

5 Monitoring LoadMaster Health in AWS

Refer to the sections below for details on monitoring LoadMaster health.

5.1 Monitoring with Kemp 360

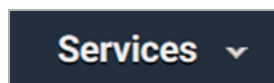
Kemp provides network and application owners with the necessary tools to maintain and monitor the application delivery infrastructure:

Product	Description	Link
Kemp 360 Central	Management and control of application delivery controllers	https://kemptechnologies.com/kemp360/central/
Kemp 360 Vision	Proactive monitoring of application delivery controllers and application health	https://kemptechnologies.com/kemp360/vision/

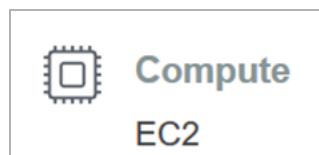
5.2 Monitoring with AWS

AWS provides monitoring on the system and instances. These status checks can be leveraged to alert on certain outages such as in an availability zone or region. You can configure status check alerts to email an administrator in such an event. This section outlines the configuration of status check alerts:

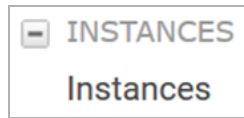
1. Log in to the AWS console.



2. Click **Services**.



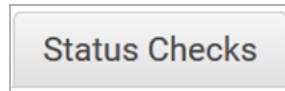
3. Under **Compute**, select **EC2**.



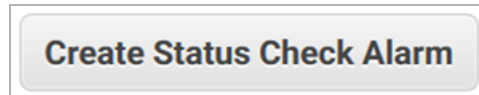
4. In the navigation on the left, click **Instances**.



5. Click the relevant instance to create an alarm for.



6. Click **Status Checks**.







7. Click **Create Status Check Alarm**.


You can use CloudWatch alarms to be notified automatically whenever metric data reaches a level you define.
To edit an alarm, first choose whom to notify and then define when the notification should be sent.

☒ **Send a notification to:** [cancel](#)


With these recipients:

☐ **Take the action:**

- ☐ Recover this instance 
- ☐ Stop this instance 
- ☐ Terminate this instance 
- ☐ Reboot this instance 

Whenever: 

Is: Failing

For at least: consecutive period(s) of 

Name of alarm:

8. Complete the following fields:

- a) Type a name for the notification group.
- b) Type an email address for alarms to be sent to.
- c) Select **Status Check Failed (Any)** in the **Whenever** drop-down list.
- d) Keep the default interval of **2 consecutive period(s) of 1 Minute**.
- e) Type a unique name for the alarm in the **Name of alarm** text box.



9. Click **Create Alarm**.

References

While the instructions above provide a basic overview of how to deploy and configure LoadMaster for AWS GovCloud, it is not designed to be a comprehensive guide to configure every possible workload. This section identifies some of many guides published on our resources section of our website. Unless otherwise specified, the following documents can be found at <http://kemptechnologies.com/documentation>.

LoadMaster Licensing, Feature Description

ESP, Feature Description

SSL Accelerated Services, Feature Description

Kemp Web Application Firewall, Feature Description

Web User Interface (WUI), Configuration Guide

Last Updated Date

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