

**IMPERVA®**

**SecureSphere**

# **WAF on Amazon AWS**

On-Demand

## **Configuration Guide**

**Version 12.0**

**February 2017**

# Copyright Notice

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The software described by this document is covered by one or more of the following patents:

US Patent Nos. 7,640,235, 7,743,420, 7,752,662, 8,024,804, 8,051,484, 8,056,141, 8,135,948, 8,181,246, 8,392,963, 8,448,233, 8,453,255, 8,713,682, 8,752,208, 8,869,279 and 8,904,558, 8,973,142, 8,984,630, 8,997,232, 9,009,832, 9,027,136, 9,027,137, 9,128,941, 9,148,440, 9,148,446 and 9,401,927.

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# End User License and Services Agreement

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BY CLICKING ON THE "ACCEPT" BUTTON, TAKING AN ACTION TO INDICATE ACCEPTANCE, OR USING THE PRODUCTS (AS DEFINED BELOW) YOU ON BEHALF OF END USER AGREE TO THE TERMS OF THIS END USER LICENSE AND SERVICES AGREEMENT ("AGREEMENT") WITH IMPERVA, INC. ("IMPERVA"). IN THE EVENT YOU ARE ENTERING INTO THIS AGREEMENT ON BEHALF OF A CORPORATE OR OTHER PUBLIC OR PRIVATE ENTITY, END USER REFERS TO THAT ENTITY, AND YOU CERTIFY THAT YOU ARE AN AUTHORIZED REPRESENTATIVE OF THE END USER. IF END USER DOES NOT AGREE TO ALL OF THE TERMS OF THIS AGREEMENT, CLICK THE "CANCEL" BUTTON, DISCONTINUE THE SET-UP AND INSTALLATION OR DISCONTINUE USE OF THE PRODUCT. IF THE TERMS OF THE AGREEMENT ARE CONSIDERED AN OFFER, ACCEPTANCE IS EXPRESSLY LIMITED TO THESE TERMS.

1. **Definitions.** The following capitalized terms shall have the meanings set forth below:
  - a. **"Appliance"** means the Imperva branded computer hardware on which the Software operates.
  - a. **"Delivery"** shall mean, (i) in the case of Software, when the Software is made available by Imperva for End User to electronically download; (ii) in the case of Subscription Services, when the Subscription Service has been provisioned and made available to End User to access; and (iii) in the case of an Appliance, when the Appliance has been tendered by Imperva for shipment.
  - b. **"Documentation"** means Imperva's technical specifications that accompany and describe the installation, use and operation of a Product.
  - c. **"End User"** means the party that has purchased the Products for its own use, either directly from Imperva or through an authorized third party.
  - d. **"Early Availability Product"** means a release of Software or Subscription Services for purposes of testing and evaluation prior to such Software or Subscription Services being made commercially available. Early Availability Products may still be under development and therefore are subject to the terms of Section 16 (Early Availability Products).
  - e. **"Early Availability Test Period"** means the period during which an End User tests an Early Availability Product. The Early Availability Test Period begins on the date of Delivery of the Early Availability Product and ends upon the earlier of (1) the date on which Imperva makes the Early Availability Product generally available, or (2) the date that Imperva specifies in a notice to End User as provided in Section 16(c).
  - f. **"Licensed Volume"** means the volume or other measurement of permitted use for the Products as agreed to by Imperva.
  - g. **"Open Source Software"** means third party software that Imperva distributes with the Software pursuant to a license that requires, as a condition of use, modification and/or distribution of such software, that the software or other software combined and/or distributed with it be (i) disclosed or distributed in source code form; (ii) licensed for the purpose of making derivative works; or (iii) redistributable at no charge.
  - h. **"Products"** mean Appliances, Software or Subscription Services, as the case may be.
  - i. **"Professional Services"** mean the installation, configuration, and training services that Imperva may provide to an End User.
  - j. **"Services"** mean Professional Services or Support, as the case may be.
  - k. **"Software"** means Imperva's or its licensors' software (in object code format) or content, any updates or upgrades thereto provided to End User by Imperva and any Documentation pertaining thereto. Software may be delivered to End User on Appliances or on a standalone basis. The term "Software" does not include Open Source Software.



- e. **Open Source Software.** Open Source Software is copyrighted and licensed under the GPL/LGPL and other licenses. Copies of or references to those licenses are included with Software in the "Help" section. If delivery of source code is required by the applicable license, End User may obtain the complete corresponding Open Source Software source code for a period of three years after Imperva's last shipment of the Software, by sending a request to: Legal Department – Open Source Software Request, Imperva, Inc., 3400 Bridge Parkway, Suite 200, Redwood Shores, CA 94065, United States.
  - f. **US Government End User.** For purposes of this Agreement, "commercial computer software" is defined at FAR 2.101. If acquired by or on behalf of a civilian agency, the U.S. Government acquires this commercial computer software and/or commercial computer software documentation and other technical data subject to the terms of the Agreement as specified in 48 C.F.R. 12.212 (Computer Software) and 12.211 (Technical Data) of the Federal Acquisition Regulation ("FAR") and its successors. If acquired by or on behalf of any agency within the Department of Defense ("DOD"), the U.S. Government acquires this commercial computer software and/or commercial computer software documentation subject to the terms of the Agreement as specified in 48 C.F.R. 227.7202-3 of the DOD FAR Supplement ("DFARS") and its successors. This U.S. Government End User Section 2(f) is in lieu of, and supersedes, any other FAR, DFARS, or other clause or provision that addresses government rights in computer software or technical data.
3. **Support and Subscription Services.** Provided End User has an active and fully paid contract for Support, Imperva will provide Support in accordance with its standard Support terms then in effect. Subscription licenses for Software include Support. Provided End User has an active and fully paid contract for Subscription Services, Imperva will provide such Subscription Services in accordance with the applicable standard Service Level Agreement (SLA) then in effect; provided, however, if End User uses Subscription Services to record events and monitor access to third party services, the continued availability of such functionality is subject to the third parties' then-current access policies.
4. **Additional Terms for Subscription Services.**
- a. **Accessing and Use of Subscription Services.** Except as explicitly set forth herein, End User is solely responsible for acquiring and maintaining all of the equipment, software, services and items necessary to access and make use of the Subscription Services, including without limitation paying all fees, charges, taxes, and other costs related to internet access and for configuration changes that may be required to route activity to the Products. End User may access the Subscription Services only through the interfaces and protocols provided or authorized by Imperva and its partners, and agrees to set up, maintain and use the Subscription Services in strict compliance with Imperva's and its partners' instructions. End User is solely responsible for maintaining the confidentiality of any passwords and account information required to access Subscription Services, for all acts that occur in connection with End User's account and to immediately notify Imperva of any unauthorized use of End User's account. In the event of expiration or termination of any Subscription Services that require DNS routing, End User will be solely responsible for rerouting its DNS traffic and Imperva, its partners and suppliers shall have no liability for End User's failure to do so.
  - b. **Authorization.** Certain Subscription Services are offered to cache, monitor and optimize web pages and web sites. As such, End User hereby grants Imperva and its partners a nonexclusive, worldwide, fully paid-up, royalty-free license to use, transfer, display, minimize and compress the content and material on End User web sites ("**End User Content**"), in any media formats, solely as necessary for the provision of the Subscription Services. Imperva and its partners do not store or provide backup services for End User Content, and if End User's use of the Subscription Services terminates for any reason, Imperva and its partners may, without notice, delete or deny End User access to any of content or meta data that may remain in its/their possession or control. In addition, End User agrees that if, at Imperva's and its partners' sole determination, End User is using the Subscription Services in a manner that violates laws, rules or regulations or creates an excessive burden or potential adverse impact on Imperva's, its partners' or its suppliers' systems, business or customers, Imperva, its partners or its suppliers may suspend or terminate End User's access to the Subscription Services without notice to or liability to End User.

5. **Professional Services.** Professional Services, if any, to be provided by Imperva to an End User will be subject to a separate statement of work ("**SOW**") agreed to by Imperva and Imperva's standard Professional Services terms then in effect.
6. **Fees, Payment Terms, Shipment and Delivery.**
  - a. For orders accepted directly by Imperva, End User shall pay Imperva the applicable fees designated by Imperva. Overage fees may apply and be due to Imperva or an Imperva reseller if End User exceeds its allowance for any Subscription Services at Imperva's then-current overage rates. Any fees payable to Imperva are non-refundable and payable in US Dollars. End User shall also pay all sales, use, value-added and other taxes, tariffs and duties of any type assessed against End User, except for taxes based on Imperva's income. Should End User be required under any law or regulation of any governmental entity or authority outside of the United States, to withhold or deduct any portion of the payments due to Imperva, then End User shall increase the sum payable to Imperva by the amount necessary to yield to Imperva an amount equal to the sum it would have received had no withholdings or deductions been made. Fees shall be invoiced as follows: (a) fees for all Subscription Services, subscription licenses for Software and Support shall be invoiced at the time of the initial order and in advance of each renewal period; (b) fees for other Software licenses and Appliance purchases will be invoiced upon Delivery. All payments from End User to Imperva are due net thirty (30) days after the date of invoice. If End User's account for Subscription Services or Support is thirty (30) days or more overdue, in addition to any of its other rights or remedies, Imperva reserves the right to suspend such services to End User, without liability to End User, until such amounts are paid in full. Imperva shall have the right to conduct and/or direct an independent accounting firm to conduct, during normal business hours, an audit of End User's facilities, computers and records to confirm End User's use of Products is in compliance with this Agreement. End User shall provide reasonable cooperation with any such audit.
  - b. Imperva will use commercially reasonable efforts to ship the Appliances and the Software license keys at the times requested in Orders (in partial or full shipments); provided, however, that Imperva shall in no event be liable for any delay in Delivery or for failure to give notice of delay. Without liability to any person and without prejudice to any other remedy, Imperva may withhold or delay shipment of any Order if End User is late in payment or is otherwise in default under this Agreement. Title to purchased Appliances and risk of loss shall pass to End User upon Delivery, and Products shall be deemed accepted by End User upon Delivery. Purchased Appliances shall be delivered Ex Works (Incoterms 2000) Imperva's designated manufacturing facility. End User may specify shipping instructions with the Order. In the absence of specific shipping instructions from End User, Imperva will ship by the method it deems most advantageous. End User shall pay and be exclusively liable for all costs associated with shipping and delivery including without limitation, freight, shipping, customs charges and expenses, cost of special packaging or handling and insurance premiums incurred by Imperva in connection with the shipment of Appliances to End User. In its discretion, Imperva may advance shipping charges on behalf of End User on Appliances shipped to End User, and End User agrees to reimburse Imperva for any such advanced charges and expenses.
  - c. If End User enters into a subscription or term agreement for Appliances, Imperva will pay the shipping and insurance costs and End User will pay customs charges and expenses and costs of special packaging or expedited shipping requested by End User. End User shall return such Appliance within fifteen (15) days after the end of the applicable term or be charged for the Appliances at Imperva's then-current prices.
7. **Confidentiality.**

- a. As used herein, "**Confidential Information**" means all confidential and proprietary information of a party ("**Disclosing Party**") disclosed to the other party ("**Receiving Party**"), whether orally or in writing, that is designated as confidential or that reasonably should be understood to be confidential given the nature of the information and the circumstances of disclosure. Confidential Information includes, without limitation, the Products, their performance (including any benchmarking information) and Imperva's pricing of the Products and Services. Confidential Information shall not include any information that: (i) is or becomes generally known to the public without breach of any obligation owed to the Disclosing Party; (ii) was known to the Receiving Party prior to its disclosure by the Disclosing Party without breach of any obligation owed to the Disclosing Party; (iii) was independently developed by the Receiving Party without breach of any obligation owed to the Disclosing Party; or (iv) is received from a third party without breach of any obligation owed to the Disclosing Party.
  - b. The Receiving Party agrees that it will (i) use Confidential Information for the sole purpose of exercising its rights and performing its obligations under this Agreement, (ii) divulge Confidential Information only to those of its and its affiliates' employees, directors, independent consultants or agents who have a need to know such Confidential Information and who are bound by professional duty or in writing (in advance) to confidentiality and non-use obligations at least as protective of such information as this Agreement, and (iii) not disclose any Confidential Information to any third party. The Receiving Party shall notify and cooperate with the Disclosing Party immediately upon discovery of any unauthorized use or disclosure of Confidential Information of the Disclosing Party. The Receiving Party may disclose Confidential Information to comply with an order from a court of competent jurisdiction or with a mandatory requirement of a governing regulatory body, provided such party, to the extent permitted by law and as soon as reasonably practicable under the circumstances, informs the Disclosing Party and allows the Disclosing Party the opportunity to object to the disclosure order or to take action to preserve the confidentiality of the information. The Receiving Party shall cooperate with the Disclosing Party in such party's reasonable efforts to limit the disclosure of the information. End User acknowledges, understands and agrees that Imperva may, as part of its provision of the Product and/or Services to End User, collect, store and use information obtained from End User, including, but not limited to, information about End User's users and customers ("**Information**") for the purposes of the provision of the Product, Services and other services to End User and for analysis and improvement of Imperva's products and services. End User represents and warrants that it has all rights and permissions necessary to transfer such Information and grant Imperva access to such Information as contemplated herein.
  - c. Upon termination of this Agreement for any or no reason, the Receiving Party shall (i) immediately cease all use of the Disclosing Party's Confidential Information, (ii) at the instruction of the Disclosing Party, either promptly destroy all Confidential Information of the Disclosing Party or return all Confidential Information of the Disclosing Party; provided, however that the Receiving Party may retain a reasonable number of copies of the Confidential Information (and any materials embedding the same) for the sole purposes of satisfying legal or regulatory requirements regarding record and data retention that the Receiving Party is obligated to comply with, enforcing this Agreement and/or archiving consistent with good business practices. For the avoidance of doubt, such copies remain subject to the confidentiality and restricted use provisions of this Agreement.
  - d. If the Receiving Party discloses or uses (or threatens to disclose or use) any Confidential Information of the Disclosing Party in breach of this Section 7, the Disclosing Party shall have the right, in addition to any other remedies available to it, to seek injunctive relief to enjoin such acts, it being specifically acknowledged by the parties that any other available remedies are inadequate.
8. **Proprietary Rights; Indemnity.**
- a. All title and intellectual property rights in and to the Products are owned exclusively by Imperva and its partners and suppliers. Other than as expressly set forth in this Agreement, no license or other rights in or to the Products and intellectual property rights thereto are granted to End User, and all such licenses and rights are hereby expressly reserved. Any ideas, suggestions, modifications and the like made by End User with respect to a Product will be the property of Imperva regardless of whether Imperva chooses to exercise its rights to incorporate such ideas, suggestions or modifications into the Product.



- b. Subject to the remainder of this Section 8(b), Imperva will indemnify End User from any Liability (as defined below) to a third party resulting from infringement of a U.S. patent or any copyright, or misappropriation of any third party trade secrets by the Product as delivered ("**Infringement Claim**"); provided that End User (1) promptly notifies Imperva of any and all threats, claims and proceedings of such Infringement Claim, (2) gives reasonable assistance in response to Imperva's request for assistance, and (3) grants Imperva sole control over defense and settlement thereof. For purposes of this section "Liability" means the resulting costs (including reasonable attorneys' fees) and damages awarded against End User to the third party making such Infringement Claim, by a court of competent jurisdiction or agreed in settlement. The foregoing obligations do not apply with respect to Products or portions or components thereof, (i) that are modified after delivery by Imperva, (ii) combined with other products, processes or materials, where the alleged infringement relates to such combination, (iii) where End User continues allegedly infringing activity after being notified thereof or modifications that would have avoided the alleged infringement have been made available to End User, or (iv) where End User's use of such Product is not strictly in accordance with this Agreement. In the event that Products are held to or believed by Imperva to infringe, Imperva at its discretion, will have the option to (A) modify the allegedly infringing Products to be non-infringing, (B) obtain for End User a license to continue using the Products, or (C) request the return of the Product and upon receipt thereof terminate this Agreement as to the infringing Product and refund to End User the unused portion of the fees paid under this Agreement for such infringing Product, depreciated on a straight-line basis over a three (3) year period. End User will defend, indemnify and hold Imperva harmless against any claims, damages settlements and expenses (including attorneys' fees) excluded from Imperva's indemnity obligations in (i) – (iv) above. THIS SECTION SETS FORTH IMPERVA'S SOLE OBLIGATION AND END USER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF VIOLATION OF THIRD PARTY RIGHTS.

9. **Warranty and Disclaimer.**

- a. Imperva warrants that during the sixty (60) day period commencing on the date of first Delivery, the Software and the Appliances will perform substantially in accordance with their Documentation. In the event of a breach of the foregoing warranty with respect to the Software, as End User's sole and exclusive remedy, Imperva shall, at its sole expense, use reasonable efforts to modify the Software, so that it performs substantially in accordance with its Documentation. In the event of a breach of the foregoing warranty with respect to an Appliance, as End User's sole and exclusive remedy, Imperva shall, at its sole expense and at its option, repair the Appliance or replace the Appliance with a new or reconditioned Appliance that performs materially in accordance with its Documentation. The foregoing warranty extends only to the original purchaser and will not apply to the misuse of or damage to the Products. The rights and remedies granted End User under this Section state Imperva's entire liability, and End User's exclusive remedy, with respect to any breach of the warranty set forth in this Section 9(a).
- b. EXCEPT AS EXPRESSLY SET FORTH IN SECTION 9(a), THE PRODUCTS OR SERVICES ARE PROVIDED "AS-IS" AND IMPERVA MAKES NO WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE. IMPERVA, ITS PARTNERS AND SUPPLIERS MAKE NO WARRANTY THAT USE OF THE PRODUCTS OR SERVICES WILL BE UNINTERRUPTED, ERROR-FREE OR DEFECT-FREE, OR AVAILABLE AT ALL TIMES. IMPERVA HEREBY SPECIFICALLY DISCLAIMS, ON BEHALF OF ITSELF AND ITS PARTNERS AND SUPPLIERS, ALL IMPLIED WARRANTIES, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW.
- c. End User acknowledge that Skyfence branded Products may provide risk information about and scoring of certain cloud applications and services and that this will be provided for information purposes only. Any such information and scoring is provided "as-is", is based on information available at the time it is gathered and may be incomplete or misinterpreted and is subject to change. Imperva disclaims any responsibility for decisions End User may make regarding the use of web applications or services based on such information.



10. **Limitations of Liability.** IN NO EVENT WILL END USER'S OR IMPERVA'S (AND ITS PARTNERS' OR SUPPLIERS') LIABILITY FOR DIRECT DAMAGES HEREUNDER EXCEED THE TOTAL VALUE OF AMOUNTS TO BE PAID BY END USER FOR THE PRODUCT OR SERVICE AT ISSUE. IN NO EVENT SHALL END USER OR IMPERVA (OR ITS PARTNERS' OR SUPPLIERS') HAVE ANY LIABILITY TO THE OTHER FOR ANY LOST PROFITS OR REVENUES, LOSS OF DATA OR USE, INTERRUPTION OF THE SERVICES, COSTS OF PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, OR FOR ANY INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES HOWEVER CAUSED AND, WHETHER IN CONTRACT, TORT OR UNDER ANY OTHER THEORY OF LIABILITY, WHETHER OR NOT THE PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. THE FOREGOING LIMITATIONS SHALL NOT APPLY TO END USER WITH RESPECT TO ANY CLAIMS ARISING UNDER SECTION 2 (LICENSES AND RESTRICTIONS), OR TO EITHER PARTY UNDER SECTION 7 (CONFIDENTIALITY).
11. **Term and Termination.**
- The term of this Agreement will commence upon Delivery of the Products to End User and will continue in effect for such time as End User continues to have the right to access the Products. Support, Subscription Services and subscription licenses for Software and/or Appliances will automatically renew at the end of the applicable term unless either party gives the other at least thirty (30) days' notice of non-renewal prior to the end of the then current term.
  - Either party may terminate this Agreement due to a material breach of this Agreement by the other party if such material breach remains uncured for a period of thirty (30) days following receipt of written notice by the breaching party; provided that Imperva may terminate this Agreement and/or all licenses granted to End User hereunder immediately upon written notice to End User if End User breaches any provision of Section 2 (License & Restrictions), Section 4 (Additional Terms for Subscription Services) or Section 7 (Confidentiality).
  - Upon the earlier of expiration of End User's rights or termination of the Agreement, Imperva will cease providing Subscription Services, Support and Professional Services, licenses granted (whether perpetual or on a subscription period basis) under this Agreement will terminate and each party shall promptly return or destroy the other party's Confidential Information in accordance with the provisions of Section 7(c). Termination shall not relieve End User of the obligation to pay any fees accrued or payable to Imperva prior to the effective date of expiration or termination. The following sections shall survive termination of this Agreement: Sections 2(c), 2(d), 2(f), 4, 6 -12, and 17.
12. **Compliance with Laws; Export.** End User acknowledges that the Software contains encryption technology and such Software and certain technical data are subject to export restrictions by the U.S. government and import restrictions by certain other governments. End User will not and will not allow any third-party to remove or export from the U.S. or allow the export or re-export of any such technical data or any part of the Software or direct product thereof: (i) into (or to a national or resident of) Cuba, Iran, North Korea, Sudan or Syria (to the extent the U.S. government or any agency thereof restricts export or re-export to such countries); (ii) to anyone on the U.S. Commerce Department's Table of Denial Orders or U.S. Treasury Department's list of Specially Designated Nationals; (iii) to any country or region to which such export or re-export is restricted or prohibited, or as to which the U.S. government or any agency thereof requires an export license or other governmental approval at the time of export or re-export without first obtaining such license or approval; or (iv) otherwise in violation of any export or import restrictions, laws or regulations of any U.S. or applicable foreign agency or authority. End User agrees to the foregoing and warrants that it is not located in, under the control of, or a national or resident of any such prohibited country or on any such prohibited party list. The Software is restricted from being used for the design or development of nuclear, chemical, or biological weapons or missile technology without the prior permission of the U.S. government. End User agrees to indemnify and hold Imperva, its partners and suppliers harmless against any claims, losses or expenses arising out of End User's breach of this Section 12.
13. **End User Mention.** End User consents to Imperva using its name and logo to identify End User as a customer of Imperva, such as use on Imperva's web site. Any use shall be subject to Imperva complying with any guidelines that End User may deliver to Imperva from time-to-time regarding the use of its name and logo. This consent terminates upon termination of this Agreement.

14. **Force Majeure.** Neither party will be liable to the other for any delay or failure to perform any obligation under this Agreement (except for a failure to pay fees) if the delay or failure is due to unforeseen events, which occur after the signing of this Agreement and which are beyond the reasonable control of the parties, such as strikes, blockade, war, terrorism, riots, natural disasters, refusal of license by the government or other governmental agencies, in so far as such an event prevents or delays the affected party from fulfilling its obligations and such party is not able to prevent or remove the force majeure at reasonable cost.
15. **Evaluation.**
- a. **Evaluation Product.** If the order is for End User to evaluate Product and its related Documentation on a temporary basis for non-commercial use ("Evaluation Product") and Imperva agrees to such evaluation, conditioned on End User's compliance with the terms and conditions of this Agreement, the license set forth in Section 2(a) shall not apply and Imperva grants to End User during the Evaluation Period (as defined below), a cost-free, nonsublicensable, nontransferable, nonassignable and nonexclusive, revocable license to use the Evaluation Product, solely at the location identified in writing by End User and solely for End User's internal evaluation of the Evaluation Product.
  - b. **Evaluation Period.** Unless otherwise agreed to by the parties in writing or terminated earlier in accordance with this Agreement, an evaluation shall commence upon Delivery of the Evaluation Product and continue for thirty (30) days thereafter ("Evaluation Period"). Upon the expiration or termination of the Evaluation Period, (i) all licenses granted under this Section 15 for such evaluation will cease, and (ii) End User will immediately return the Evaluation Product to Imperva and destroy or erase any intangible copies of the Evaluation Product, and, upon request, certify in a writing signed by an officer of End User and delivered to Imperva that all such copies of have been returned, destroyed or erased.
  - c. **Additional Evaluation Terms.** Notwithstanding anything to the contrary in this Agreement, End User acknowledges and agrees that the Evaluation Product is provided for evaluation "AS-IS" and Imperva and its suppliers make no representations or warranties of any kind, express or implied, with respect to the Evaluation Product, including, without limitation, any implied warranties of merchantability, title, fitness for a particular purpose, system integration, non-infringement or any other warranties arising out of course of dealing, usage or trade, and no obligation under Section 8(b) (Indemnity) or under the SLAs for Subscription Services shall arise with respect to an Evaluation Product.
16. **Early Availability Products.**
- a. **License.** If the order is for End User to evaluate an Early Availability Product and its related Documentation and Imperva agrees to such evaluation, conditioned on End User's compliance with the terms and conditions of this Agreement, the license set forth in Section 2(a) shall not apply and Imperva grants to End User during the Early Availability Test Period, a cost-free, nonsublicensable, nontransferable, nonassignable and nonexclusive, revocable license to use the Early Availability Product, solely at the location identified in writing by End User and solely for End User's internal evaluation of the Early Availability Product.
  - b. **Additional Terms for Early Availability Products.** Notwithstanding anything to the contrary in this Agreement, End User acknowledges and agrees that an Early Availability Product is still under development, the features and functionality may change before any commercial release of the Product and Imperva has no obligation to license to End User any of the features or functionality as part of a commercially available software product. Early Availability Products are provided for evaluation "AS-IS" and Imperva and its suppliers make no representations or warranties of any kind, express or implied, with respect to the Early Availability Products, including, without limitation, any implied warranties of merchantability, title, fitness for a particular purpose, system integration, non-infringement or any other warranties arising out of course of dealing, usage or trade, and no obligation under Section 8(b) (Indemnity) or under the SLAs for Subscription Services shall arise with respect to an Early Availability Product.

- c. **Notice and Effect of Termination.** Notwithstanding other notice provisions set forth in this Agreement, Imperva may end the Early Availability Test Period at any time and for any reason upon notice by email to the person End User designates as a contact for the Early Availability Product evaluation. Upon the termination of the Early Availability Test Period, all licenses granted under this Section 16 will cease, and either (i) End User will license a commercially available Product or (ii) End User will return the Early Availability Product to Imperva and destroy or erase any intangible copies of the Early Availability Product.
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Imperva, Inc.  
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September 2016

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# CHAPTER 1

## Introduction to SecureSphere on AWS

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This publication is intended for administrators tasked with deploying an Imperva SecureSphere in an Amazon Web Services (AWS) environment. It assumes the reader has a working knowledge of AWS and details the configuration steps required to achieve a successful deployment.

[Deployment Overview 15](#)



## Deployment Overview

This document describes deployment of SecureSphere on AWS in the order it should take place. It contains the following:

	Task/Subject	Description
1	<a href="#">Understanding SecureSphere Deployment in AWS</a> on page 16	Provides an overview of Deploying SecureSphere in AWS, includes topology examples, and lists prerequisites.
2	<a href="#">Deploying the SecureSphere Management Server</a> on page 22	Provides instructions on how to deploy the SecureSphere Management Server once AWS infrastructure has been configured.
3	<a href="#">Deploying a SecureSphere Gateway</a> on page 26	Once the license key has been uploaded, you need to deploy SecureSphere Gateways.
5	<a href="#">Configuring AWS Infrastructure</a> on page 35	Provides step-by-step instructions on how to prepare and configure the AWS infrastructure so that it is ready for the deployment of the SecureSphere Management Server and Gateway.
5	<a href="#">Post Deployment Review</a> on page 49	After having deployed both the SecureSphere Management Server and Gateway, you should conduct a review to verify that you are ready to go online.
6	<a href="#">Patching AWS</a> on page 51	Provides instructions on how to patch AWS SecureSphere deployments.

# CHAPTER 2

## Understanding SecureSphere Deployment in AWS

---

In AWS deployments, the SecureSphere Gateways, the protected web servers and the Elastic Load Balancers (ELBs) – are all virtual.

The management server can also be virtual, or you can have it at your data center. A deployment in which the management server is at the data center is called a Hybrid Mode. For more information, see [Hybrid Mode](#) on page 71.

Moreover, the Gateways are scalable: in periods of peak demand, additional Gateways can be added to the Gateway Group and torn down when they are no longer needed. The web servers too can be scaled in the same way, in response to changes in the volume of traffic.



**Note:** SecureSphere AMIs are provided as Hardware Virtual Machines (HVM).

In AWS the Management Server holds the license for itself and the Gateways it manages. In order to enable auto scaling, your license should allow the number of desired gateways. If the traffic volume exceeds the capacity of the BYOL Gateways then it is possible to deploy additional On Demand gateway stacks to the management Servers, enabling further scaling up.

[Topology Overview 17](#)

[HTTP vs. HTTPS Support 20](#)

[System Prerequisites 20](#)

[AWS Configuration Checklist 21](#)

## Topology Overview

This section provides an overview of SecureSphere deployment in AWS and is meant to provide a model for deploying SecureSphere in AWS to match your requirements.

The configuration described here deploys SecureSphere in an existing AWS web server deployment, with two Availability Zones in the VPC.



**Note:** Configuration in this document includes two availability zones to illustrate deployment which provides High Availability (HA). Users who don't require High Availability can deploy SecureSphere on AWS with one Availability Zone.

## AWS Deployment Options

SecureSphere on AWS can be deployed in a number of configurations, as shown in the following table. Each row represents a different deployment and its options.

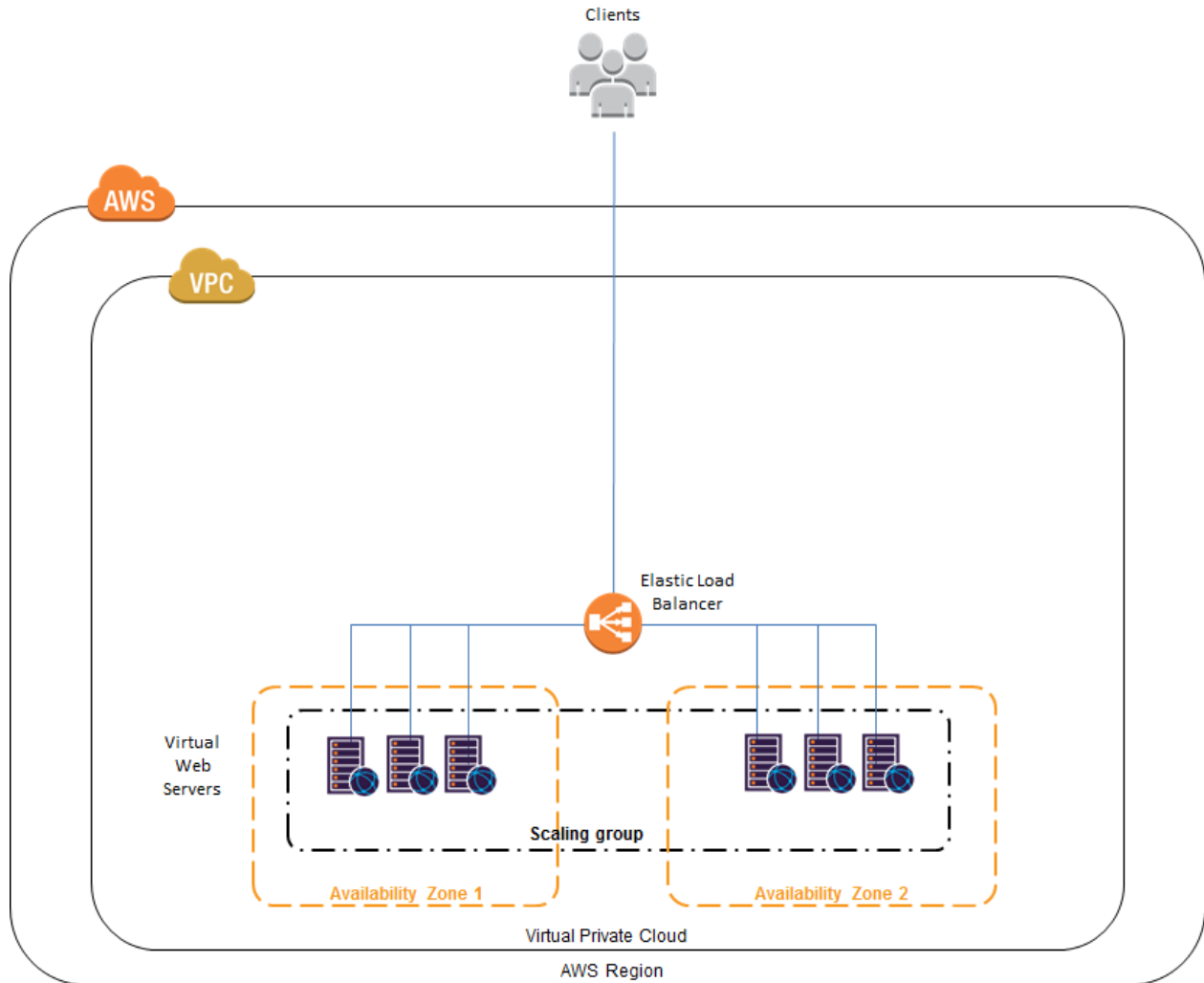
AWS Deployment Options

	# of External ELBs	Gateways	Internal ELB	Web Servers
1	Single	Gateway Group per Availability Zone	Spanning single or multiple Availability Zones	Gateway Group within Availability Zone or spanning multiple Availability Zones
2	Single	Gateway Group spanning multiple Availability Zones	Spanning single or multiple Availability Zones	Gateway Group within Availability Zone or spanning multiple Availability Zones
3	Multiple	Single Gateway Group spanning multiple Availability Zones	Spanning single or multiple Availability Zones	Gateway Group within Availability Zone or spanning multiple Availability Zones
4	Multiple	Gateway Group per Availability Zone	Spanning single or multiple Availability Zones	Gateway Group within Availability Zone or spanning multiple Availability Zones
5	<b>VPC Peering</b> across multiple VPCs, within a single region, across one or more AWS accounts. For more information, see <a href="#">VPC Peering</a> on page 48.			

## Deployment Example without SecureSphere

The figure below shows a typical deployment before SecureSphere. It includes:

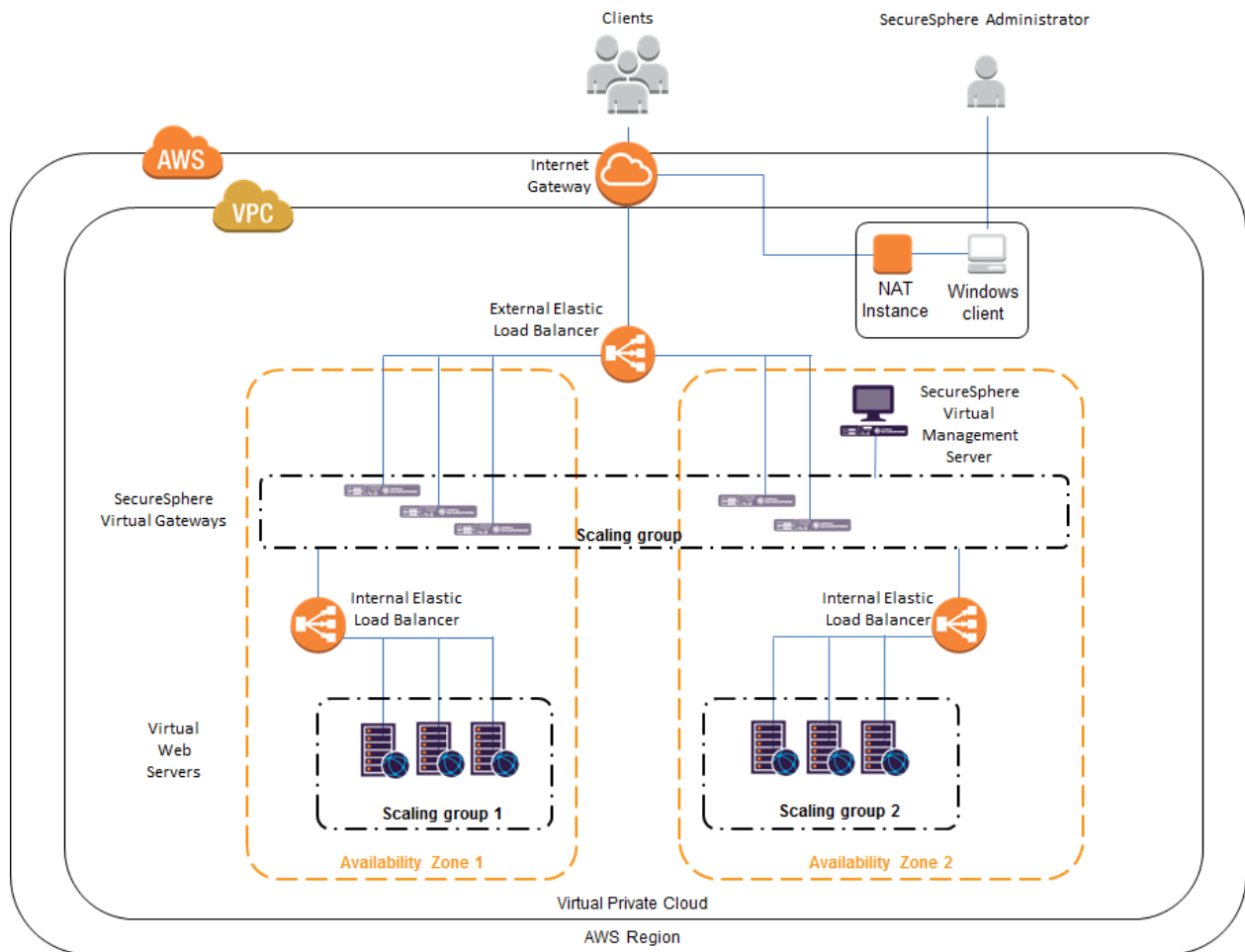
- Two availability zones
- An external Elastic Load Balancer
- A scaling group for each set of virtual web servers



## Deployment Example with SecureSphere

The image below shows the deployment with SecureSphere. This example includes:

- Two availability zones
- Access for the SecureSphere Administrator, typically provided via a Windows Client installed from the AWS Marketplace or a VPN
- An external and two internal Elastic Load Balancers
- A scaling group for SecureSphere Gateways
- A scaling group for each set of virtual web servers
- A NAT Instance (or any other technology that provides external access)
- A Windows client to provide access to the browser based SecureSphere user interface



Please note that this is not the only deployment possibility. There are others: for example, a single internal ELB might be used for the web application servers (though this is not recommended for the reasons set out in [Minimizing Traffic Costs and Delays](#) on page 49) or several different applications might be deployed behind the SecureSphere WAF.



**Note:** The SecureSphere Virtual Management Server is in a private subnet, not a public subnet. See [Subnets](#) on page 39 for a more detailed diagram, and [Windows Client - Connecting to the SecureSphere Management Server](#) on page 24 for information on the connection from the SecureSphere GUI Client to the Management Server.

## HTTP vs. HTTPS Support

Configuration described in this guide is based on a deployment where HTTPS communication is terminated at the External ELB, meaning that all traffic within the VPC is via HTTP. SecureSphere also supports full HTTPS traffic within the VPC.

The configuration below is relevant when working with HTTPS within the VPC.

To configure HTTPS support, you must:

- Configure a listener to HTTPS in the Load Balancer window.
- Upload an SSL certificate to the Load Balancer.
- Set the **Instance Protocol** to HTTPS.

Please note that using HTTPS will significantly impact performance, and traffic will be limited up to 100Mbps. Therefore, if using HTTPS it is recommended to use the SecureSphere **AV1000**.

## System Prerequisites

Before beginning the deployment, you need obtain the following:

Component	Definition
Amazon Account ID	You will get these when you open your account with Amazon Web Services.
Amazon Username and Password	The user who will perform the SecureSphere deployment should be defined as a <b>Power User</b> and granted all the required privileges for configuring the VPC and instantiating the SecureSphere Management Server, Gateway and the other components.
SecureSphere Template Files	<p>These files are downloaded from the Imperva FTP site. You need these files to create AWS stacks. These files are in JSON format. The possible AWS setups and their corresponding template files are as follows:</p> <ul style="list-style-type: none"> <li>• <b>WAF Gateway:</b> SecureSphere-WAF-Gateway-AWS-CloudFormation-&lt;SecureSphere-Version&gt;-BYOL.json</li> <li>• <b>Management Server, single mode:</b> SecureSphere-Management-AWS-CloudFormation-&lt;SecureSphere-Version&gt;-BYOL.json</li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Making changes to the original JSON files provided by Imperva beyond what is instructed in this document is not allowed. Any changes to these files without being approved by Imperva will not be supported.</li> </ul>
AWS Configuration	If your AWS environment is not configured, you need to configure it before setting up the SecureSphere stacks. For more information, see <a href="#">Configuring AWS Infrastructure</a> on page 35.



In addition, you must ensure that your AWS Service Limits enable you to configure a sufficient number of instances and other resources for your specific deployment. Running out of instances in the course of the deployment will cause unnecessary delays. For more information, refer to the AWS documentation.



**Note:** This guide assumes that your web application servers are already deployed in AWS.

## AWS Configuration Checklist

If you already have your AWS environment set up, you must confirm that all the items in the checklist below are properly configured. Failure to do so can lead to difficulties in getting your SecureSphere deployment to work. More details are given in [Configuring AWS Infrastructure](#) on page 35.

	Configuration Step	
1	<b>Design the deployment.</b>	Determine which AWS components you will need and confirm that your AWS Service Limits enable you to configure them all.
2	<b>Create the VPC.</b>	Make sure that the VPC exists and the web servers are already deployed in it. If this is not the case in your deployment, create the VPC at this point. For more information, see <a href="#">VPC (Virtual Private Cloud)</a> on page 37.
3	<b>Create the subnets.</b>	Create a subnet for each group of AWS components. For more information, see <a href="#">Subnets</a> on page 39.
4	<b>Create a key pair.</b>	Key pairs are used to launch instances and to connect to them. For more information, see <a href="#">Key Pair</a> on page 40.
5	<b>Enable Internet Connection.</b>	Use either a <b>NAT instance</b> or an <b>HTTP Proxy</b> to enable routing traffic from the Management Server and Gateways to the internet (for example, for a syslog server), and to notify AWS of the success or failure of instance creation. For more information, see <a href="#">NAT Instance</a> on page 41 and <a href="#">HTTP Proxy</a> on page 42.
6	<b>Update route tables.</b>	An AWS route table corresponds to the route table of a physical router. For more information, see <a href="#">Route Table</a> on page 42.
7	<b>Create Elastic Load Balancers.</b>	See <a href="#">Elastic Load Balancers</a> on page 44.
8	<b>Elastic IP Addresses</b>	See <a href="#">Elastic IP Address</a> on page 45.
9	<b>Create security groups.</b>	A security group corresponds to an internal firewall. For more information, see <a href="#">Security Groups</a> on page 46.

# CHAPTER 3

## Deploying SecureSphere Servers on AWS

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You use different procedures for deploying Management Servers and Gateways on AWS.

You must deploy the Management Server first.

[Deploying the SecureSphere Management Server](#) 22

[Deploying a SecureSphere Gateway](#) 26

[Configuring Imperva Variables in the CloudFormation Template File](#) 31

### Deploying the SecureSphere Management Server

To deploy a SecureSphere Management Server, you must set up a Management Server stack in AWS. Before commencing, make sure you have implemented the System Prerequisites. For more information, see [System Prerequisites](#) on page 20.

[Setting up a Management Server Stack](#) 23

[Windows Client - Connecting to the SecureSphere Management Server](#) 24

[Sealed CLI](#) 24

[Terminating a Management Server](#) 26

## Setting up a Management Server Stack

Note that setting up a stack is an operation conducted entirely in Amazon Web Services. The following procedure represents the most up-to-date AWS configuration. Imperva is not responsible for any changes that Amazon may make in their configuration.

### To set up a SecureSphere Management Server stack in AWS:

1. In your browser, navigate to your Amazon Web Services page, and log in using your AWS account information.
2. Under **Deployment and Management**, click **CloudFormation**. The **CloudFormation** page appears.
3. Click **Create Stack**. The **Select Template** page appears.
4. Under **Template**, select **Upload a template to Amazon S3** and click **Browse**. The **File Upload** dialog box appears.
5. Navigate to the management server json file (SecureSphere-Management-AWS-CloudFormation-<SecureSphere-Version>-BYOL.json) on your computer, then click **Open**. The dialog box closes.
6. In the **Select Template** page, click **Next**. The **Specify Parameters** page appears.
7. Under **Stack**, enter a name for your new Management Server stack.
8. Enter values for the parameters in accordance with the table below. Click **Next**. The **Options** page appears.
9. Optional - Under **Tags**, for **Key** enter Name, and for **Value** enter the name you gave the stack.
10. Click **Next**. The Review page appears, summarizing the values for the parameters of your new stack.
11. Review these values to ensure they are correct.
12. Check the box **I acknowledge that this template might cause AWS CloudFormation to create IAM resources**. Click **Create**. The **CloudFormation** page appears, showing the progress of the creation of your new stack.

You can also configure the CloudFormation template directly. For more information, see [Configuring Server Parameters in the CloudFormation Template File](#) on page 31.

Management Server instance parameters	Description
<b>InstanceType</b>	Specify the AWS instance type, default is <b>c3.xlarge</b> .
<b>KeyPairName</b>	Specify the name of the key pair to be used when accessing the Management Server with SSH.
<b>VpcId</b>	Specify the ID of the VPC in which to instantiate the Management Server. For example: vpc-a0f832c5.
<b>ManagementSubnet</b>	Specify the ID of the subnet in which the Management Server is to be instantiated. <b>Note:</b> For Management Server HA instances, enter two subnet IDs, as represented by the two entries below.
<b>PrimaryManagementSubnet</b>	For MX-HA only, specify the ID of the primary subnet in which the Management Server is to be instantiated. For more information, see <a href="#">Understanding AWS Management Server High Availability (MX-HA) Mode</a> on page 73
<b>SecondaryManagementSubnet</b>	For MX-HA only, specify the ID of the secondary subnet in which the Management Server is to be instantiated. For more information, see <a href="#">Understanding AWS Management Server High Availability (MX-HA) Mode</a> on page 73 .

Management Server instance parameters	Description
<b>SecurePasswd</b>	The password used for Gateway-Management Server communication. The same password must be entered when configuring the SecureSphere Gateways.
<b>Timezone</b>	The timezone of the Management Server in POSIX format. A list of valid time zone formats is available at <a href="http://il1.php.net/manual/en/timezones.php">http://il1.php.net/manual/en/timezones.php</a> <a href="http://il1.php.net/manual/en/timezones.php">http://il1.php.net/manual/en/timezones.php</a> . Click on the continent and enter one of the time zones exactly as displayed there, for example, <b>America/Halifax</b> or <b>Africa/Nairobi</b> .
<b>PrivateIpAddress</b>	The IP address(es) to which SecureSphere administrators will connect in order to configure SecureSphere. If you use the default, the IP address(es) will be assigned by AWS DHCP. <b>Note:</b> This parameter is not available in MX-HA.

## Windows Client - Connecting to the SecureSphere Management Server

There are two possibilities for connecting a client to the SecureSphere Management Server and configuring SecureSphere using the GUI:

Over a VPN – This method takes advantage of an existing internal enterprise VPN to provide security. For more information, search for OpenVPN in the Amazon documentation.

Remotely running a Windows client within the VPC – This method uses Microsoft RDP. You will have to create a Windows client instance and assign a key pair for this option.



**Note:** Windows clients are available in the Amazon marketplace.

## Sealed CLI

The following commands are available in the Command Line interface (CLI) in On-Demand deployments.

Command	Description
<b>aws-logs-remote</b>	upload AWS logs and configuration to URL
<b>date</b>	show the system date and time
<b>df</b>	show file system disk space usage
<b>ec2log</b>	view ec2 installation log
<b>export-local</b>	export database to local file system
<b>export-remote</b>	export-remote
<b>gti-gw-remote</b>	pull gti files extracted from the gw
<b>gti-remote</b>	upload get-tech-info to URL

Command	Description
<b>gwlog</b>	view gateway component log
<b>help</b>	list available commands
<b>history</b>	show command history
<b>hostname</b>	show the system hostname
<b>ifconfig</b>	show network interface settings
<b>impctl</b>	Imperva SecureSphere command line control utility
<b>import-local</b>	import database from local backup
<b>import-remote</b>	import database from remote URL
<b>netstat</b>	show network statistics
<b>patch-remote</b>	download and install SecureSphere patch from URL
<b>ping</b>	send ICMP ECHO_REQUEST to network hosts
<b>quit</b>	exit SecureSphere Shell
<b>reboot</b>	reboot the machine
<b>shutdown</b>	shutdown the machine
<b>svlog</b>	view server component log
<b>syslog</b>	view system log (/var/log/messages)
<b>traceroute</b>	print the route packets trace to network host
<b>version</b>	show version information
<b>wget</b>	test URL connectivity

To obtain help for any of these commands (except exit), enter either of the following commands:

`help <command name>`

**or**

`<command-name> -h`

**or**

`? <command-name>`

## Terminating a Management Server

Termination Protection is configured by default for Management Servers. To terminate a Management Server instance, you must first turn off Termination Protection (**Services > EC2**) and then terminate the Management Server.

## Deploying a SecureSphere Gateway



**Note:** Before deploying the SecureSphere Gateway, install the Imperva license on the Management Server and start the Management Server. For more information, see [Licensing SecureSphere - On Demand](#) on page 34.

A Gateway should have exactly two NICs on different segments (subnets) in the same Availability Zone:

- One NIC (eth0) is for monitoring traffic and should be facing the internal and external ELBs. This interface cannot be on the same subnet as the Management Server.
- The other NIC (eth1) is for management (including health checks) and communication with the SecureSphere Management Server.



**Note:** In contrast to a physical deployment, in the AWS environment the Gateway is configured so that management traffic is on eth1 and monitored traffic is on eth0.

[Setting up a WAF Gateway Stack 26](#)

[Configuring a SecureSphere Gateway 28](#)

[Creating a SecureSphere Server Group and HTTP Service 28](#)

[Configuring KRP Rules 29](#)

[Configuring Operation Mode 30](#)

[Important Notes 31](#)

## Setting up a WAF Gateway Stack

Note that setting up a stack is an operation conducted entirely in Amazon Web Services. The following procedure represents the most up-to-date AWS configuration. Imperva is not responsible for any changes that Amazon may make in their configuration.

### To set up a SecureSphere WAF Gateway stack in AWS:

1. In your browser, navigate to your Amazon Web Services page, and log in using your AWS account information.
2. Under **Deployment and Management**, click **CloudFormation**. The **CloudFormation** page appears.
3. Click **Create Stack**. The **Select Template** page appears.
4. Under **Stack**, enter a name for your new WAF Gateway stack.
5. Under **Template**, select **Upload a template to Amazon S3** and click **Browse**. The **File Upload** dialog box appears.
6. Navigate to the WAF Gateway json file (SecureSphere-WAF-Gateway-AWS-CloudFormation-<SecureSphere-Version>-BYOL.json) on your computer, then click **Open**. The dialog box closes.
7. In the **Select Template** page, click **Next**. The **Specify Parameters** page appears.
8. Enter values for the parameters in accordance with the table below. Click **Next**. The **Options** page appears.
9. Optional - Under **Tags**, for **Key** enter Name, and for **Value** enter the name you gave the stack.
10. Click **Next**. The Review page appears, summarizing the values for the parameters of your new stack.



11. Review these values to ensure they are correct.
12. Check the box **I acknowledge that this template might cause AWS CloudFormation to create IAM resources**. Click **Create**. The **CloudFormation** page appears, showing the progress of the creation of your new stack.

You can also configure the CloudFormation template directly. For more information, see [Configuring Server Parameters in the CloudFormation Template File](#) on page 31.

**AWS WAF Gateway Parameters - On Demand**

Gateway instance parameters	Description
<b>InstanceType</b>	Specify the AWS instance type, default is <b>c3.xlarge</b> .
<b>ManagementServer</b>	The IP address of the Management Server which manages the Gateway. Note: For Management HA deployments, enter the DNS name of the load balancer. For more information, see <a href="#">AWS Management Server High Availability (MX-HA) Mode</a> on page 73.
<b>GatewayGroup</b>	Enter the name of the Gateway group to which the Gateway belongs. If the <b>UseSingleGatewayGroup</b> parameter (see below) is set to False, the Availability Zone will be appended to the name. This will be updated on the Management Server.
<b>KeyPairName</b>	Specify the name of the key pair to be used when accessing the Gateways with SSH.
<b>VpcId</b>	Specify the ID of the VPC in which to instantiate the Gateway. For example: vpc-a0f832c5.
<b>ManagementSubnets</b>	Specify a comma-separated list of subnet IDs, one for each Availability Zone which the Gateway scaling group is to span, in the same order as the list of Availability Zones specified under <b>AvailabilityZones</b> .
<b>DataSubnets</b>	Specify a comma-separated list of subnet IDs, one for each Availability Zone which the Gateway scaling group is to span, in the same order as the list of Availability Zones specified under <b>AvailabilityZones</b> .
<b>ScalingMinSize</b>	Specify the minimum number of Gateways in the Gateway scaling group. The minimum supported is one gateway. However the default value for this field is two. It is recommended that you use two gateways to provide full gateway high availability.
<b>ScalingMaxSize</b>	Specify the maximum number of Gateways in the Gateway scaling group. You must ensure that you have a license for the number of Gateways specified; otherwise the scale up will fail.
<b>ELBNames</b>	Specify a comma-separated list of the names of the external ELBs. The Gateways will be assigned these ELBs, and will be scaled up and down based on the ELBs health check.
<b>SecurePasswd</b>	The password used for Gateway-Management Server communication. The same password must be entered when configuring the SecureSphere Management Server.

Gateway instance parameters	Description
Timezone	The timezone of the Management Server in POSIX format. A list of valid time zone formats is available at <a href="http://il1.php.net/manual/en/timezones.php">http://il1.php.net/manual/en/timezones.php</a> <a href="http://il1.php.net/manual/en/timezones.php">http://il1.php.net/manual/en/timezones.php</a> . Click on the continent and enter one of the time zones exactly as displayed there, for example, <b>America/Halifax</b> or <b>Africa/Nairobi</b> .

The SecureSphere Gateways are in effect reverse proxies for the internal ELBs, and the details of the web application servers can be hidden from the Gateways. See the figure 4 in VPC for an example of this configuration.

## Configuring a SecureSphere Gateway

Once you have configured AWS infrastructure, deployed the SecureSphere management server, licensed SecureSphere, and deployed SecureSphere gateways, you then need to access SecureSphere via the SecureSphere GUI and configure a number of items to get up and running. These items include:

	Configuration in SecureSphere	For more information...
1	Create a server group.	<a href="#">Creating a SecureSphere Server Group and HTTP Service</a> on page 28
2	Define one or more KRP rules for the SecureSphere Gateway, so that traffic is correctly directed to the web servers.	<a href="#">Configuring KRP Rules</a> on page 29
3	Configure the Server Group's Operation Mode.	<a href="#">Configuring Operation Mode</a> on page 30

For more information on configuring a SecureSphere gateway, see the **SecureSphere Web Security User Guide**. The following sections describe configuration issues specific or particularly important in the AWS environment.

## Creating a SecureSphere Server Group and HTTP Service

### To create a SecureSphere server group and HTTP service:

1. Once the gateway has been deployed, access SecureSphere configuration via a web browser using the following path: `https://<Your Management IP address>:8083/` and log on.
2. Place all the Gateways in the same Gateway Group.
3. For each Gateway in the Gateway Group, create an alias. Give all the aliases in the same Gateway Group the same name.
4. In the SecureSphere **Main** workspace under **Setup > Sites**, right click the **Sites** tree and click **Create Server Group**.
5. Right click the new **Server Group** and click **Create Service > HTTP Service**.

See the **SecureSphere Web Security User Guide** for assistance with these tasks.

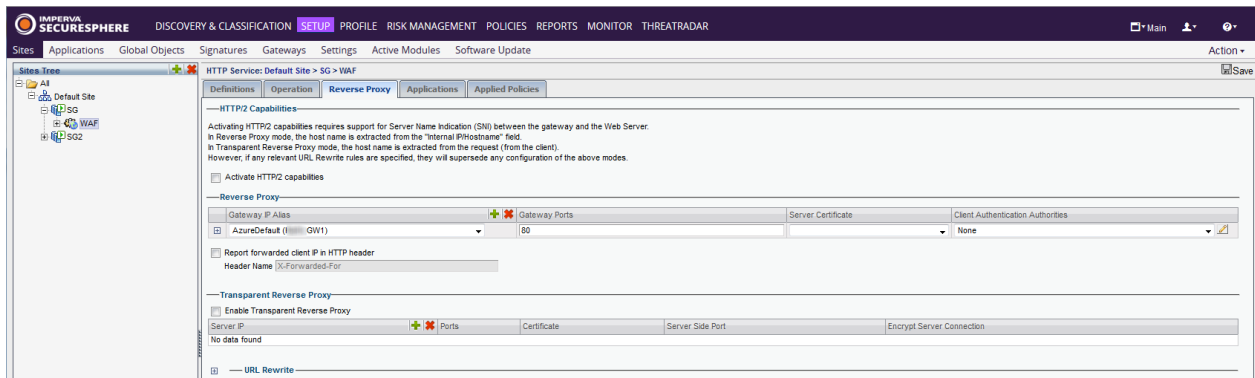
## Configuring KRP Rules

When defining a KRP rule in SecureSphere, the traffic should be directed to the internal ELB fronting the web application servers.

If you choose the topology recommended elsewhere in this guide, then the internal ELB(s) should be in the same availability zone as the corresponding Gateway group. In the image below, GW-Group-AZ1 should forward traffic to ELBs in AZ1, while GW-Group-AZ2 should forward traffic to ELBs in AZ2.

On the other hand, if you choose a topology in which a single gateway group spans multiple availability zones, using a single inner ELB, which means traffic can cross between availability zones, then the traffic should be directed from that single gateway group to the single ELB.

To access KRP rule configuration, in the Server Group you created, create an **HTTP service** and select it in the **Sites** tree. Click the **Reverse Proxy** tab. Then under **Gateway IP alias**, click **New** and configure the relevant details.



In an AWS deployment, in the field **Internal IP / Hostname**, enter the **AWS DNS Name** of the **internal ELB** rather than an IP address, because the internal ELB's IP address may change from time to time. You can see the DNS Name in **Load Balancers** under **EC2 Dashboard > Network & Security**.



**Note:** In order to avoid the ELB health check failures, you need to create a default reverse proxy rule. If you want to automate the process, see [Create Default Reverse Proxy Rule](#) on page 80.

In order for the WAF system to properly process the original source IP, the client IP forwarding (X-forwarded-For) header must be enabled. To enable the X-Forwarded-For header, select the desired Web service, select the **Operation** tab. Under **Forwarded Connections**, select **Identify real client IP according to HTTP forwarding header**. Then click the **New** button and edit the details as desired.

The screenshot shows the configuration page for an HTTP service, titled "HTTP Service: Default Site > New > Also new". The page has several tabs: "Definitions", "Operation" (which is selected), "Reverse Proxy", "Applications", and "Applied Policies". Under the "Operation" tab, there are several expandable sections: "User Tracking", "Restrictions", "Data Masking", "Forwarded Connections", "Advanced HTTP Settings", "XML Parsing", and "NTLM Authentication". The "Forwarded Connections" section is expanded, showing a checkbox labeled "Identify real client IP according to HTTP forwarding header" which is checked. Below this checkbox is a table with two columns: "Header Name" and "Proxy IP Group". The first row in the table has "X-Forwarded-For" in the "Header Name" column and "Any IP" in the "Proxy IP Group" column. There are plus and minus icons between the columns, and a plus icon in the "Proxy IP Group" column. Below the table, there is a note: "For security reason, it is strongly recommended to set an IP group for each proxy."

For more information about defining SecureSphere KRP rules, see the [SecureSphere Web Security User Guide](#).

## Configuring Operation Mode

There are three operation modes:

- **Active:** SecureSphere monitors traffic and apply policies. This means that alerts are generated and traffic is blocked when required by a policy.
- **Simulation** (default): SecureSphere simulates monitoring, that is, it monitors traffic and generates alerts and violations, but does not block traffic. It is recommended to use simulation mode when SecureSphere is learning traffic.
- **Disabled:** SecureSphere neither monitors nor blocks traffic. Traffic does not access the server. This mode should be used only in exceptional circumstances, for example, for debugging.

Initially, after SecureSphere is first installed, it is configured in simulation mode. While in this mode, you can identify suspicious traffic by examining whatever alerts are generated. At some point, you will want to switch to active mode in order to block this traffic, some of which will be blocked by SecureSphere's default security policies. There will be a period of time during which you may wish to fine tune the policies, possibly defining new ones, in order to adapt your configuration to your specific requirements, for example, to eliminate false positives.

### To configure the operation mode:

1. In the **Main** workspace, select **Setup > Sites**.
2. In the **Sites** window, click the server group whose operating mode you want to modify.
3. Click the **Definitions** tab.
4. Select the desired **Operation Mode**.
5. Click **Save**.

For information on fine tuning your configuration, see the [SecureSphere Web Security User Guide](#).

## Important Notes

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- **Gateway Group Names:** SecureSphere Gateway group names should not be changed after they are initially defined. The reason is that scaled-up Gateways will continue to be assigned to the old group name.
- **Auto Scaling:** You can change the default auto scaling rules in Amazon CloudWatch if you find them unsuitable for your specific environment. Auto scaling cannot be disabled, but you can configure the rules in such a way that no auto scaling ever takes place.
- **Gateway Configuration Changes:** Changing the configuration of Gateways is complicated by the need to ensure that scaled-up Gateways receive the changed configuration rather than the previous one. To do this, update the stack (**Services > CloudFormation**) with the changed values, then manually scale the Gateways down and then up.

## Configuring Imperva Variables in the CloudFormation Template File

You can edit the CloudFormation template (JSON) file directly to configure Imperva variables. You can edit any or all of the server parameters. There are several parameters that can only be edited in this way. You must edit the file before you deploy the server.

An example of a portion of an edited json file is given below. In it, you have entered a value for the **DNSDomain** parameter, and a comma-delimited list of IP addresses for the **NTPServers** parameter.

```
"ImpervaVariables": {
```

```
...
```

```
  "Network": {
```

```
    "DNSDomain": "example.com",
```

```
    "NTPServers": "10.0.0.1,10.0.0.2,10.0.0.3",
```



**Note:** If your deployment includes an HTTPS proxy, you must edit the Proxy parameters before deployment.

**To configure server parameters in the CloudFormation template file:**

1. Open the CloudFormation template file in a text editor.
2. Use search to find the first appearance of the string `ImpervaVariables`.
3. In that section, find the parameter whose value you wish to edit.
4. For that parameter, enter the desired value.
5. Save the file.

Section (JSON file)	Parameter	Definition
<b>General (Gateway)</b>	<code>UseSingleGWGroup</code>	Enter one of: <ul style="list-style-type: none"> <li>• <b>True:</b> There will be only one Gateway group (specified by the <code>GatewayGroup</code> parameter - see above).</li> <li>• <b>False:</b> The Availability Zone name will be appended to the Gateway group names created by SecureSphere. So if there are multiple Availability Zones, there will be multiple Gateway groups.</li> </ul>
<b>General (Management Server)</b>	<code>HealthCheckPort</code>	The port on which the MX-HA primary server listens, in order to notify the Load Balancer which machine is the primary server.
<b>SSH (Management Server and Gateway)</b>	<code>UserName</code>	The name of a SecureSphere administrative user who will be accessing the Gateway using CLI commands. <b>Note:</b> The user will authenticate using the key pair (see the <code>KeyPairName</code> parameter above).
<b>SSH (Management Server and Gateway)</b>	<code>ImpervaLicenseKey</code>	The Imperva License Key for configuring an unsealed machine. <b>Note:</b> All machines by default are launched in sealed mode. If you want to configure a machine so that is unsealed, you must enter the license key in the CloudFormation template file.
<b>Hotfix (Gateway)</b>	<code>URL</code>	An accessible URL (e.g. <code>http</code> , <code>ftp</code> , <code>scp</code> ) of an encrypted Imperva hotfix patch file that is downloaded and installed the startup of a WAF Gateway.
<b>Hotfix (Gateway)</b>	<code>PASSWORD</code>	URL access password (if necessary).
<b>Hotfix (Gateway)</b>	<code>USER</code>	URL access user (if necessary).
<b>Network (Management Server and Gateway)</b>	<code>DNSDomain</code>	The default is to use Amazon's DNS server domain, but you can specify another domain.

Section (JSON file)	Parameter	Definition
<b>Network (Management Server and Gateway)</b>	NTPServers	Specify the addresses of the NTP servers. The default is to use the value you configured, if any, for the DHCP Options Sets. <b>Note:</b> It is strongly recommended that you configure the NTP servers on the DHCP Options Sets in accordance with Amazon's instructions. Failure to do so can cause AWS permission issues in the long term. Configure the parameter <b>NTPServers</b> .
<b>Network (Management Server and Gateway)</b>	DNSServers	The default is to use Amazon's DNS servers, but you can specify the IP addresses of other servers.
<b>Network (MX-HA)</b>	PrimaryPrivateIPAddress	For MX-HA only: The IP address of the primary Management Server to which SecureSphere administrators will connect in order to configure SecureSphere. If you use the default, the IP address will be assigned by AWS DHCP.
<b>Network (MX-HA)</b>	SecondaryPrivateIPAddress	For MX-HA only: The IP address of the secondary Management Server to which SecureSphere administrators will connect in order to configure SecureSphere. If you use the default, the IP address will be assigned by AWS DHCP.
<b>Proxy (Management Server and Gateway)</b>	Host	The IP address of the HTTPS proxy.
<b>Proxy (Management Server and Gateway)</b>	Password	The password for the connection to the HTTP proxy.
<b>Proxy (Management Server and Gateway)</b>	Port	The port number on the HTTPS proxy to which to send HTTPS traffic.
<b>Proxy (Management Server and Gateway)</b>	User	The user name for the connection to the HTTP proxy.

# CHAPTER 4

## Licensing SecureSphere - On-Demand

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Your copy of SecureSphere On-Demand does not require a license. You can begin using SecureSphere On-Demand immediately after you install and configure it.

After configuring SecureSphere, it is recommended that you notify Imperva of your contact details. To do this, go to **Admin > Licenses** and click in the **Amazon On-Demand Registration Form** section.



**Note:** SecureSphere supports both BYOL and On-Demand Licenses at the same time. If your implementation uses both of these license types, they will both appear in the Management Server licensing window.

After completing the registration process, you will be have access to the following:

1. Imperva Support and Professional Services.
2. The full range of ThreatRadar feature included with SecureSphere On-Demand.



# CHAPTER 5

## Configuring AWS Infrastructure

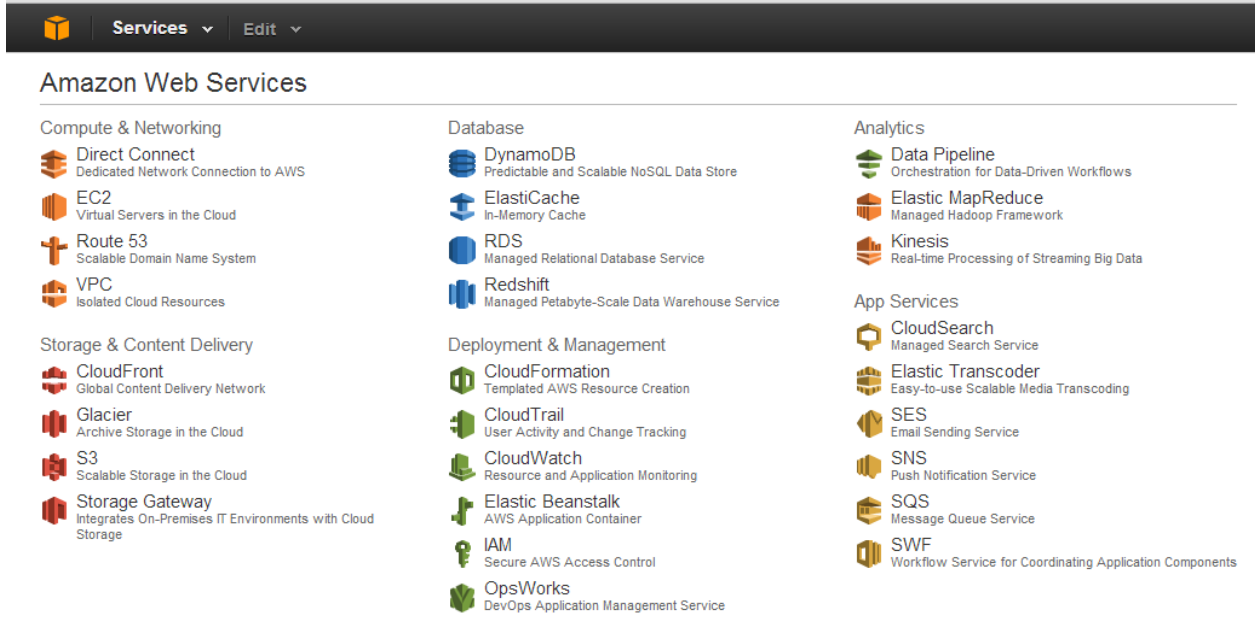
---

The following sections – which assume a working knowledge of AWS on the part of the reader – describe the special considerations in configuring a SecureSphere deployment in AWS, and provide suggested configuration guidelines. However, since every deployment is unique, the reader should approach these guidelines with some flexibility and be prepared to depart from them if warranted by the particular characteristics, requirements and constraints of the specific environment.

- AWS Console 36
- VPC (Virtual Private Cloud) 37
- Subnets 39
- Key Pair 40
- Enable Internet Connection 41
- Route Table 42
- Elastic Load Balancers 44
- External ELB 45
- XFF 45
- SSL 45
- Session Stickiness (Affinity) 45
- Elastic IP Address 45
- Security Groups 46
- NAT Instance Security Groups 48
- VPC Peering 48

# AWS Console

When you log in to AWS, the Amazon Console is displayed.



**Figure 1: Amazon Console**

The Amazon Web Services you will be using in this deployment are the following:

Amazon Web Services Component	will be used in order to ...
EC2	Create virtual servers in the Amazon Cloud. In this deployment, the web application servers have already been created and deployed (see the figure in <a href="#">Deployment Example without SecureSphere</a> on page 18).
VPC	Create a Virtual Private Cloud in which the deployment will be located. In this deployment, the VPC already exists.
Cloud Formation	Create the SecureSphere Management Server and Gateways from templates provided by Imperva.
Cloud Watch	Monitor the success / failure of the deployment itself and afterwards, events in the VPC.

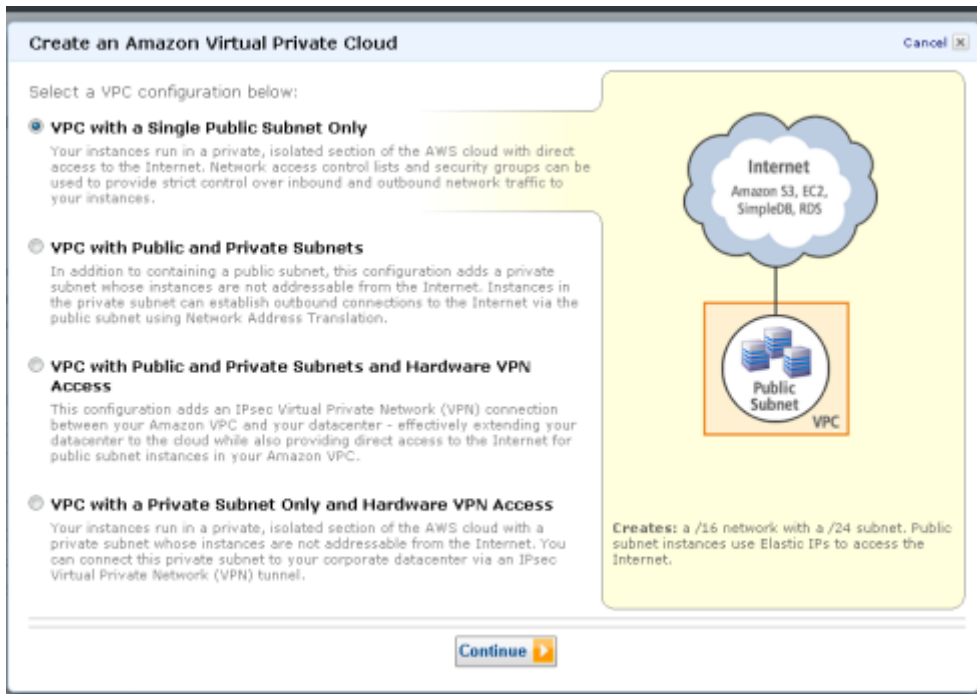
# VPC (Virtual Private Cloud)

VPCs are configured by clicking Start VPC Wizard in the VPC Dashboard.



Figure 2: Creating a Virtual Private Cloud

Then the following is displayed once starting the VPC Wizard.

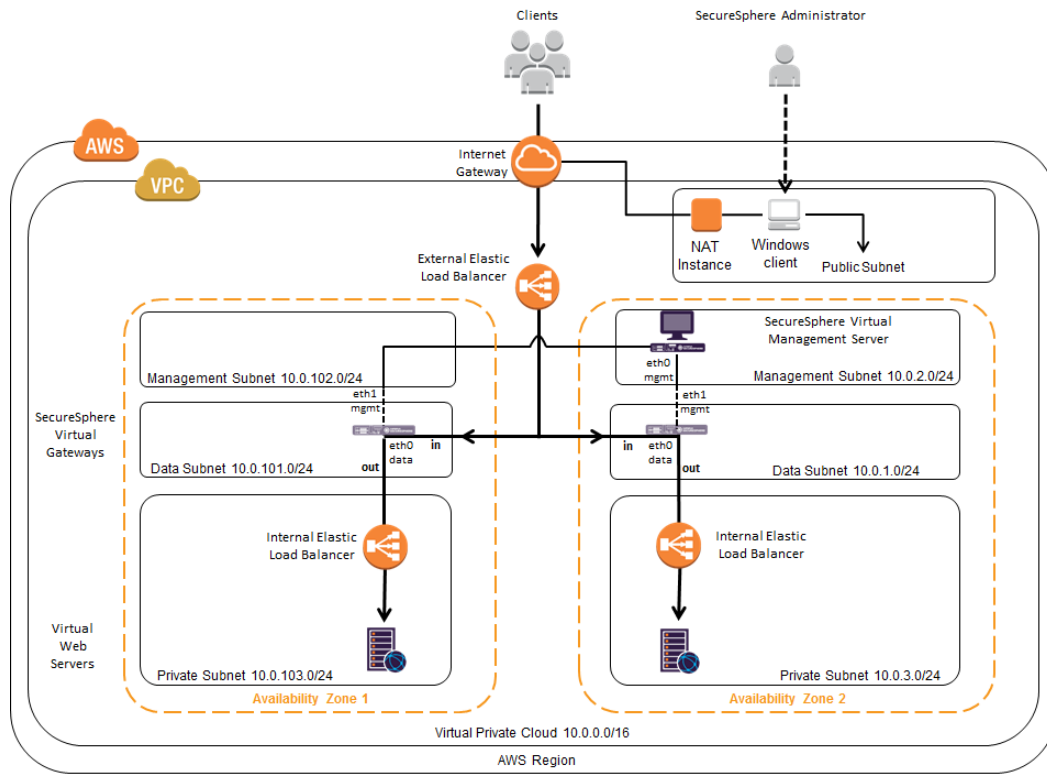


A SecureSphere

Gateway scaling group should span all the Availability Zones in which the web servers are located. In this deployment, the VPC already exists, and consists of two Availability Zones (see [Deployment Example with SecureSphere](#) on page 19).

# Subnets

Subnets are configured in VPC Dashboard > Subnets.



The screenshot shows the AWS VPC console interface. The 'Create Subnet' button is highlighted in yellow. Below the navigation pane, a table lists existing subnets. The table has columns for Subnet ID, State, VPC ID, CIDR, Available IPs, Availability Zone, and Route Table. The subnets listed are all in an 'available' state and belong to VPC ID vpc-4b7e7529.

Subnet ID	State	VPC ID	CIDR	Available IPs	Availability Zone	Route Table
subnet-17e6ee75	available	vpc-4b7e7529	10.0.4.0/24	249	us-west-1a	rtb-4bc3c629
subnet-07e6ee65	available	vpc-4b7e7529	10.0.1.0/24	250	us-west-1a	rtb-4bc3c629
subnet-4a6d380c	available	vpc-4b7e7529	10.0.6.0/24	251	us-west-1c	rtb-4bc3c629
subnet-05e6ee67	available	vpc-4b7e7529	10.0.3.0/24	251	us-west-1a	rtb-4bc3c629
subnet-a09dc9e6	available	vpc-4b7e7529	10.0.8.0/24	249	us-west-1c	rtb-4ac3c628
subnet-04e6ee66	available	vpc-4b7e7529	10.0.2.0/24	251	us-west-1a	rtb-4bc3c629
subnet-21585343	available	vpc-e5fff487	10.0.0.0/24	251	us-west-1a	rtb-ac5258ce
subnet-4d6d380b	available	vpc-4b7e7529	10.0.5.0/24	251	us-west-1c	rtb-4bc3c629
subnet-51f0d033	available	vpc-4b7e7529	10.0.7.0/24	250	us-west-1a	rtb-4ac3c628

Figure 3: Creating a Subnet

The VPC should be configured with several subnets, for example as shown in the figure below.

The NAT instance and Windows client are located within a public subnet. While all other subnets are private, that is, they are not directly accessible from the internet.

A Windows client needs to be separately added from the Amazon Marketplace. It is then used so the SecureSphere Administrator can communicate with the SecureSphere Management Server.

**Notes:**

- A Gateway has two NICs, each one of which is connected to a different subnet in the same Availability Zone.
- The Gateway's data interface cannot be on the same subnet as the Management Server.

This configuration forces all traffic to the web servers to pass through the SecureSphere Gateways. When the deployment is complete, it is essential that you confirm that there are no alternate routes to the web servers that bypass the SecureSphere Gateways.

## Key Pair

Amazon EC2 uses public-key cryptography to encrypt and decrypt login information. Public-key cryptography uses a public key to encrypt a piece of data, such as a password, then the recipient uses the private key to decrypt the data. The public and private keys are known as a key pair.<sup>1</sup>

To log in to your instance, you must create a key pair in AWS, then specify the name of the key pair when you launch an instance, and provide the private key when you connect to the instance.

Linux/Unix instances have no password, and you use a key pair to log in using SSH. With Windows instances, you use a key pair to obtain the administrator password and then log in using RDP.

Key Pairs are configured in **Services > EC2 Dashboard > Key Pairs**.

You will need to define at least one key pair that will be used, for example, when you:

- Launch an instance, for example, a SecureSphere Gateway, Management Server or NAT instance
- Connect to an instance, using SSH for example

If lost, the key file cannot be restored, so you must store the Key Pair file in a safe and secure manner.

# Enable Internet Connection

Either set up a NAT Instance or a HTTP Proxy for each VPC.

## NAT Instance

NAT Instances are used in this deployment in order to provide access to the SecureSphere Management Server and Gateway from the public domain. However you can alternatively decide to use other means, such as an HTTP Proxy. NAT instances are configured in **Services > EC2 > Instances**.



**Note:** For detailed information about NAT instances, refer to the Amazon documentation.

**Figure 4: Configuring a NAT Instance**

A NAT instance enables SecureSphere Gateways and Management Servers in the private subnets to access the internet, for example, for syslogs, Imperva FPS services, and to notify AWS of the success or failure of instance creation.



**Note:** For information about configuring a Security Group for a NAT instance, see [NAT Instance Security Groups](#) on page 48.

A NAT instance is located in a public subnet (see the figure in [Subnets](#) on page 39).

Additionally, in order to provide public access you need to configure the associated **Security Group** protocol with a Source IP address of 0.0.0.0.

Protocol	Type	Port Range (Code)	Source
All traffic	All	0 - 65535	Custom IP 0.0.0.0

You should disable source/destination checking for the NAT instance, because it must be able to send and receive traffic when the source or destination is not itself. For more information, search for **Disabling Source/Destination Checks** in the Amazon AWS documentation.

## HTTP Proxy

If your deployment includes an HTTPS proxy, you must edit the Gateway and MX JSON template files before deployment. For more information, see [Configuring Imperva Variables in the CloudFormation Template File](#) on page 31.



**Note:** HTTPS support is required in a proxy-only environment for AWS deployment.

## Route Table

You need to set up the subnets' routing as follows:

- **NAT:** The Nat subnet is public. It must be routed to the IGW.
- **Management Server:** The Management Server subnet is private. Set the default route (0.0.0.0/0) to the NAT subnet.
- **Gateway:** The Gateway subnet is private. Set the default route (0.0.0.0/0) to the NAT subnet.

For deployments with a complex arrangement of subnets, it is recommended that you set up a route table dedicated to the SecureSphere elements. The routing table for the private subnets (both Management Server and Gateway) can be the same routing table.

Route tables are configured in **Services > VPC > Route Tables**.

The screenshot shows the AWS Management Console interface for creating a route table. The left sidebar shows the navigation menu with 'Route Tables' highlighted. The main content area displays the 'Create Route Table' window for VPC 'vpc-e5'. A table lists existing route tables:

Route Table ID	Associated With	Main	VPC
rtb-a5258cd	0 Subnets	Yes	vpc-e5#487 (10.0.0.0/16)
rtb-ac5258ce	1 Subnet	No	vpc-e5#487 (10.0.0.0/16)

Below this, the '1 Route Table selected' section shows the configuration for 'Route Table: rtb-ac5258ce'. The 'Routes' tab is active, showing a table of routes:

Destination	Target	Status	Propagated	Actions
10.0.0.0/16	local	active	No	Remove
0.0.0.0/0	igw-4a565d28	active	No	Remove
	select a target			Add

**Figure 5: Create Route Table Window - Public Subnet Routing**



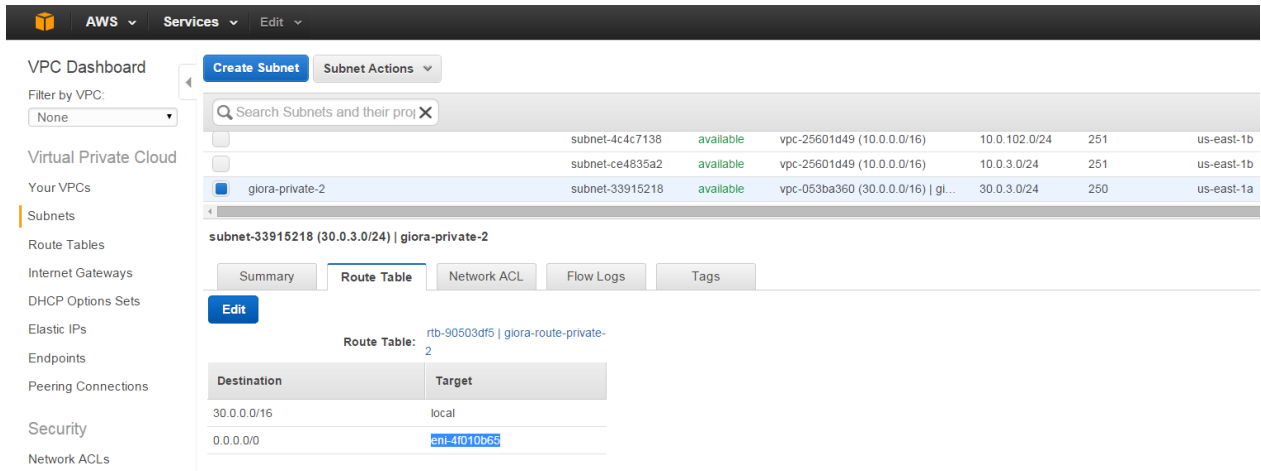
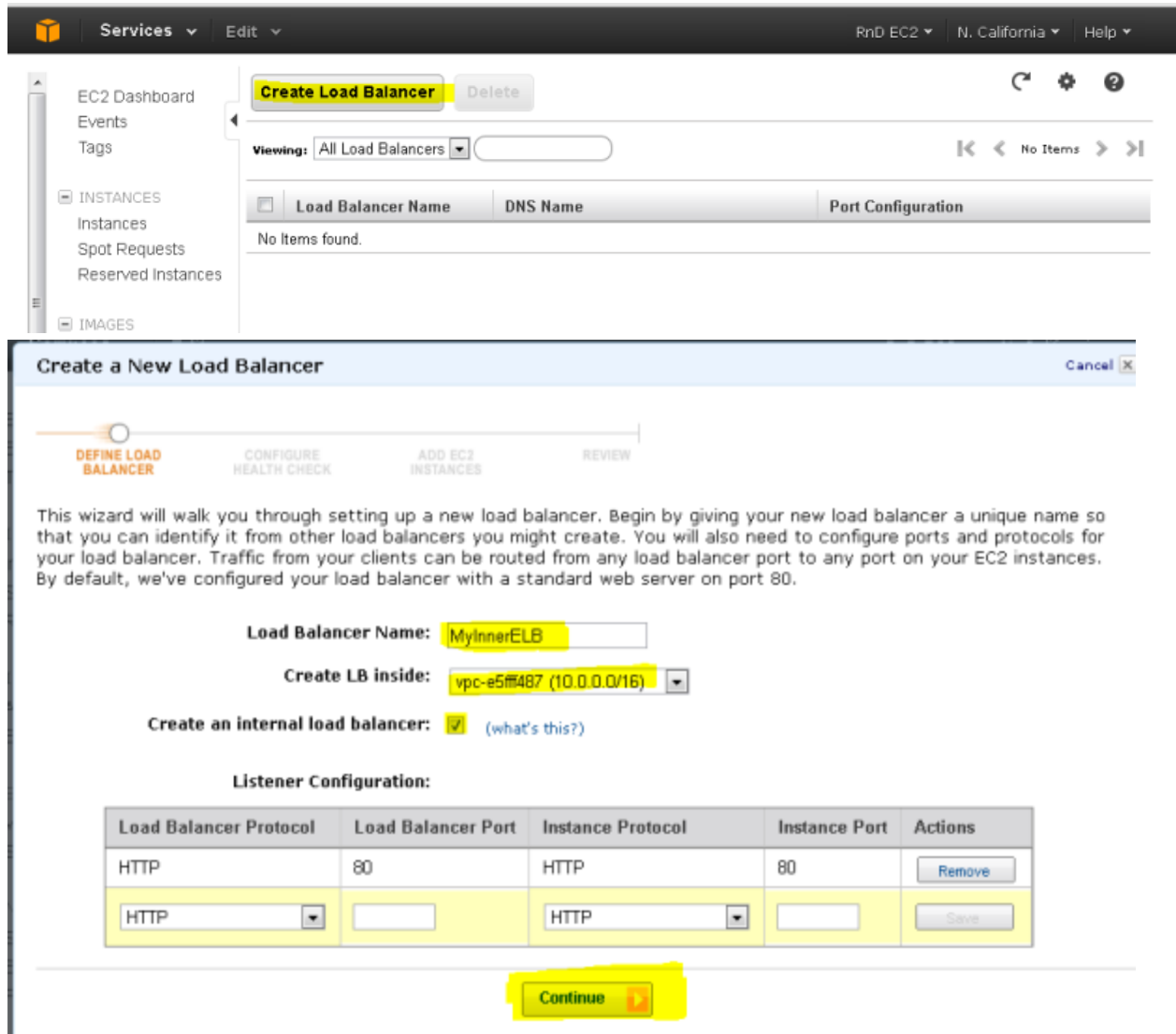


Figure 6: Create Route Table Window - Private Subnet Routing

# Elastic Load Balancers

Elastic Load Balancers are configured by clicking Create Load Balancer in Services > EC2 > Load Balancers.



**Figure 7: Create an Elastic Load Balancer**

In the deployment shown in [Deployment Example without SecureSphere](#) on page 18, there is only an external Load Balancer fronting the web servers.

In the deployment shown in [Deployment Example with SecureSphere](#) on page 19, you will need three ELBs: an external ELB to balance traffic between the SecureSphere Gateways in the two Availability Zones, and an internal ELB in each Availability Zone to balance traffic among the web servers in that Availability Zone.



**Notes:**

- The Availability Zones selected in the ELB should be public subnets (with IGW routing).
- It is strongly recommended that you configure the ELBs to work in HTTP mode, and not TCP mode, as TCP mode could have a negative impact on the WAF functionality.

## External ELB

This topic addresses details regarding the following items:

DNS 45

Health Check 45

### DNS

---

After completing the deployment you must associate the DNS entry for the web application with the external ELB.

### Health Check

---

When configuring the external ELB's Health Check, you must set the **Ping Protocol** to TCP and the **Ping Port** to 80.

### XFF

Because the external ELB is in effect a Reverse Proxy, XFF should be enabled in SecureSphere. For more information, see **Supporting Web Load Balancers** in the **SecureSphere Web Security User Guide**.

### SSL

It is recommended, for performance reasons, that SSL be offloaded to the external ELB. For more information, see **Adding SSL Keys** in the **SecureSphere Web Security User Guide**.

## Session Stickiness (Affinity)

If the web application does not maintain its own session cookies, then an ELB can be configured – by defining a stickiness policy in the AWS Console – to insert its own cookie to bind subsequent requests from the same user to the same web application instance.

## Elastic IP Address

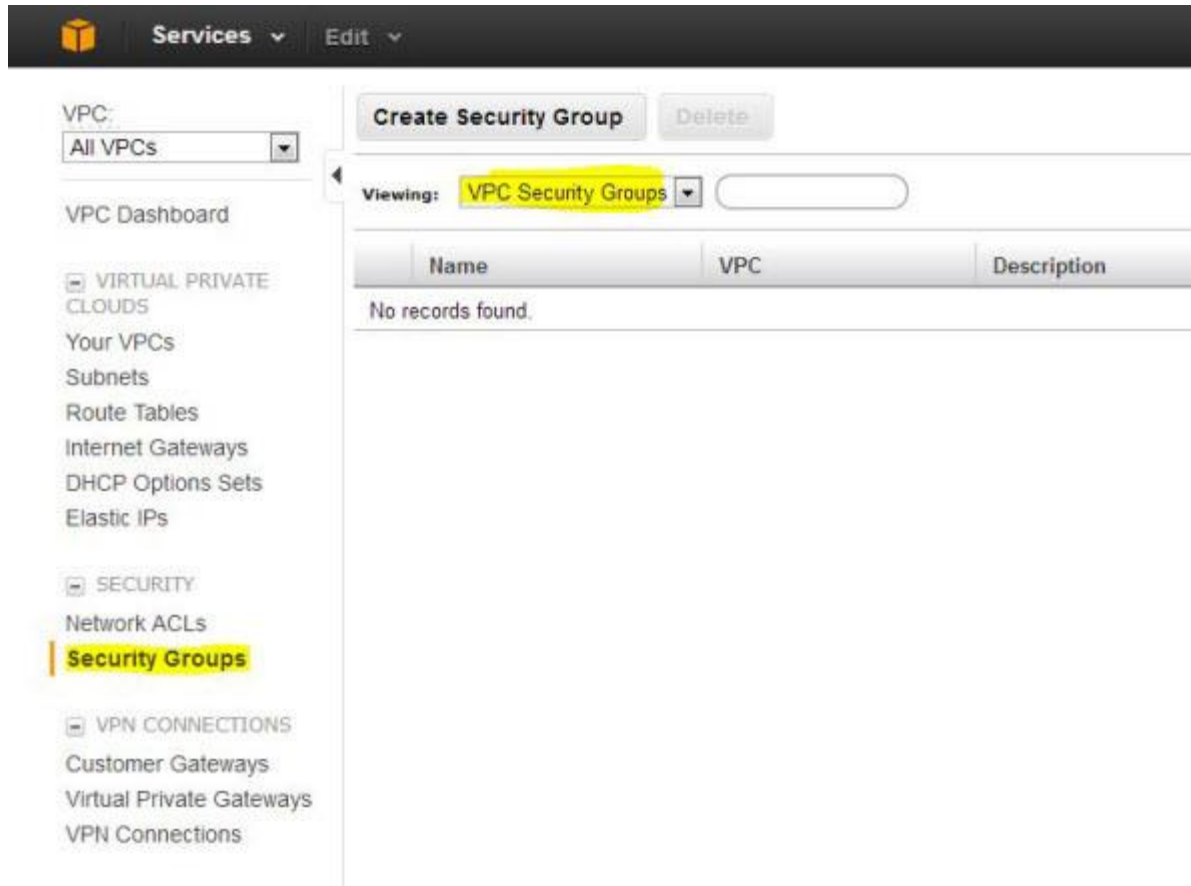
Elastic IP addresses are configured in **Services > EC2 > Elastic IPs**.

An Elastic IP address is a publicly available IP address, enabling access from the internet.

- If you are connecting to the Management Server from a Windows client using RDP, you should define an Elastic IP address for the Management Server.
- If you are connecting to the SecureSphere Management Server over a VPN, you may not need to define any Elastic IP addresses.

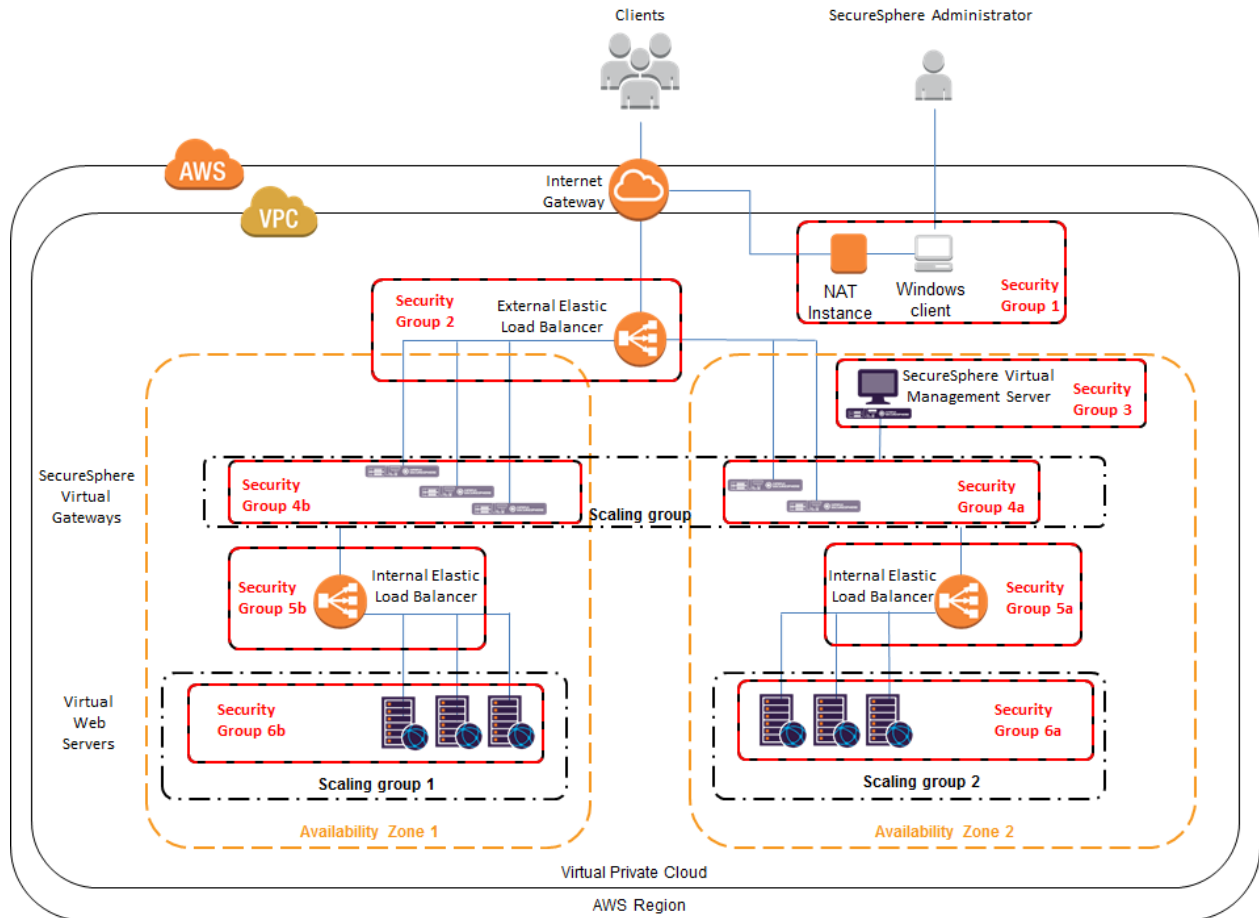
## Security Groups

A Security Group acts as a firewall for instances, for example, for the SecureSphere Gateway instance. CloudFormation automatically creates two Security Groups: one for the Management Server and another for the Gateways. You may wish to modify the automatically-created Security Groups, for example, to protect ports other than the default port 80.



**Figure 8: Creating a Security Group**

The following diagram shows the Security Groups that should be defined for the deployment depicted in Deployment Example with SecureSphere on page 19.



	Security Group	Rules
1	Windows Client/NAT Instance	Allows permitted outbound traffic to access the internet and responses to that traffic to enter the VPC (see <a href="#">NAT Instance Security Groups</a> on page 48 below).
2	External ELB	Accepts traffic from the internet and sends traffic only to the SecureSphere Gateways.
3	Management Server	Sends and accepts SSH and inbound HTTP traffic from the SecureSphere administrator, either over a VPN or a remote client (see <a href="#">Windows Client - Connecting to the SecureSphere Management Server</a> on page 24). Sends and accepts traffic from the SecureSphere Gateways it manages, as well as the enabled external systems, for example, <i>imperva.com</i> , the <i>Imperva Cloud</i> , <i>syslog</i> , <i>etc.</i>
4a 4b	Gateways	Sends and accepts SSH from the SecureSphere administrator, traffic from the Management Server, as well as the enabled external systems, for example, <i>imperva.com</i> , the <i>Imperva Cloud</i> , <i>syslog</i> , <i>etc.</i> Sends and accepts traffic to the internal ELBs.
5a 5b	Internal ELBs	Accepts traffic only from the SecureSphere Gateways and sends traffic only to the web servers.

	Security Group	Rules
6a 6b	Application web servers	Typically, accepts and sends traffic only from/to the internal ELBs, but other rules are possible as well as long as the only publicly-available path to the application web servers is through the SecureSphere Gateways.

You may find it necessary to adjust these rules for your specific deployment. In addition, you must take care that the Security Group rules are synchronized with changes to the configuration, for example, when new services are added.

## NAT Instance Security Groups

Configure the NAT instance Security Group as described in the table below in order to allow the NAT instance to:

- receive internet-bound traffic from the private subnet
- receive SSH traffic from your network
- send traffic to the internet, which enables the instances in the private subnet to get software updates

Inbound			
the private subnet	TCP	80	Allows inbound HTTP traffic from servers in the private subnet.
the private subnet	TCP	443	Allows inbound HTTPS traffic from servers in the private subnet.
the public IP address range of your network	TCP	22	Allows inbound SSH access to the NAT instance from your network (over the Internet gateway)
0.0.0.0/0	TCP	80	Allows outbound HTTP access to the internet.
0.0.0.0/0	443	443	Allows outbound HTTPS access to the internet.



**Note:** For detailed information about NAT instances and Security Groups, refer to the Amazon documentation.

## VPC Peering

In a situation where there is more than one VPC within the same region, there are Gateways on all the VPCs, but only one Management Server on one of the VPCs, you use VPC Peering to enable communication between these VPCs to enable the Management Server to connect with all the Gateways.



**Note:** A VPC with no NAT instance has no internet access, and VPC Peering alone does not solve this. In order for SecureSphere to work across multiple VPCs, you must create a NAT instance for each VPC.

# CHAPTER 6

## Post Deployment Review

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This section lists some of the issues you should review after completing the deployment.

Secure Access 49

Minimizing Traffic Costs and Delays 49

Scaling Rules / License 50

Cross-Region Load Balancing 50

IP Address Change 50

### Secure Access

Ensure that the only publicly-available path to your application web servers is through the SecureSphere Gateways.

### Minimizing Traffic Costs and Delays

You should configure your deployment in a way that reduces to a minimum the traffic flowing among multiple Availability Zones. This has two benefits: you will avoid the extra costs as well as the delays associated with cross-Availability Zone traffic. For example, if you have two Availability Zones, configure an internal ELB for each Availability Zone (as in [Deployment Example with SecureSphere](#) on page 19) rather than a single internal ELB for both.

## Scaling Rules / License

You should take care to configure the scaling rules to match your Imperva license, that is, to ensure that AWS will not attempt to scale up SecureSphere Gateways beyond the number permitted by the license and to scale down Gateways when their time-based licenses expire.

## Cross-Region Load Balancing

If you require the capability to perform load balancing across Amazon regions, you should employ third-party tools for this purpose.

## IP Address Change

It may happen that the IP address of the SecureSphere Management Server changes, for example, after a crash or after Amazon maintenance. If this occurs, the Gateways will be unable to communicate with the Management Server until you manually restore the previous IP address.

You should enable detailed AWS monitoring so that you can respond in a timely manner to IP address changes and other important events.



# CHAPTER 7

## Patching AWS

---

The procedure for patching an AWS SecureSphere deployment is different for Management Servers and for Gateways.

You should patch the Gateway(s) before you patch the Management Server.

For information on patching an AWS Gateway, see [Patching an AWS Gateway](#) on page 52.

For information on patching an AWS Management Server, see [Patching an AWS Management Server](#) on page 53.

[Patching an AWS Gateway](#) 52

[Patching an AWS Management Server](#) 53

## Patching an AWS Gateway

Gateways are deployed using Cloud Formation. Because a Gateway instance does not store persistent data, it can be created and destroyed by the AWS scaling mechanism. For this reason, directly patching a running Gateway instance is not effective: new Gateways will not include the patch.

The patch procedure therefore consists of updating the scaling group (Cloud Formation stack).



**Note:** When patching/upgrading an AWS Gateway, you must first make sure that the patch procedure does not exceed the number of licensed Gateways. For more information, see [Configuring Auto Scaling for Gateway Patch or Upgrade](#) on page 77.

### To patch an AWS Gateway:

1. Back up your current CFN template as follows:
  - Select the Cloud Formation stack.
  - Click the **Template** tab.
  - Save the template.
  - Click the **Parameters** tab.
  - Save the parameters.

This procedure is described in the AWS documentation.



**Note:** If you are already running the maximum number of Gateways allowed by the Management Server license, the new Gateway will not be able to register to the Management Server. You will have to take down one of the Gateways before continuing with this procedure. If you have a High Availability deployment and do not want to lose High Availability functionality during the patch update, create an additional On-Demand Gateway stack to handle the traffic during the update.

2. In Cloud Formation, select the Gateway stack.
3. Click **Update Stack**.
4. Click **Upload a template to Amazon S3**.
5. Upload the JSON file of the patch AMI.
6. Review the JSON parameters and verify them. The parameter values are carried over from the previous version, and you can change them if required.
7. Password parameters are empty and you must select **Use existing value** to copy them to the new template.
8. In the **Options** screen, leave the default settings and click **Next**.
9. Check the box **I acknowledge that this template might cause AWS CloudFormation to create IAM resources**.
10. Click **Update** to start the patch installation.
11. The Gateway stack will now perform a “rolling update,” that is, it will take down one Gateway after another and bring up a new instance (which includes the patch) in its place, by default at ten minute intervals until all the Gateways are updated.

If for whatever reason you want to restore the previous version, update the Cloud Formation stack to use the previous template and parameters and the stack will be updated, that is, restored to the previous unpatched version.

For information on patching an AWS Management Server, see [Patching an AWS Management Server](#) on page 53.

## Patching an AWS Management Server

This procedure describes how to patch an AWS Management Server.

**To patch an AWS Management Server:**

1. Stop the Management Server (using the `impctl teardown` CLI command).
2. Create a snapshot of the Management Server.
3. Run the patch file using the `patch-remote` command, as follows:
 

```
patch-remote [-h] [--insecure] [--user USER:PASSWORD] [--proxy HOST:PORT]
  [--proxy-user USER:PASSWORD] PATCH_URL.
```

For details regarding optional download flags, see the table **Optional Download Flags** below.

4. When the installation ends, reboot the Management Server instance.

If for whatever reason you want to restore the previous version, you can do this from the snapshot.

### Optional Download Flags

Name	Description
<code>--insecure</code>	Allows connections to SSL sites without certificates
<code>--user USER:PASSWORD</code>	Sets the server's username and password
<code>--proxy HOST:PORT</code>	Tells SecureSphere to use an HTTP proxy on the listed port
<code>--proxy-user USER:PASSWORD</code>	Defines the proxy's username and password

For information on patching an AWS Gateway, see [Patching an AWS Gateway](#) on page 52.

# APPENDIX A

## Troubleshooting

---

This section includes some guidelines for troubleshooting deployment problems. The following information for troubleshooting is available:

- [Troubleshooting Checklist 55](#)
- [Troubleshooting Errors 56](#)
- [Get AWS System Log 57](#)
- [HTTP Health Check 58](#)
- [Debugging a Failed Gateway 60](#)
- [Collecting AWS Data for Troubleshooting 61](#)

# Troubleshooting Checklist

The following is a list of items that you can check when trying to troubleshoot installation or operation of SecureSphere on AWS.

**Troubleshooting Checklist**

	Item to Verify	Description
	<b>AWS System Log</b>	<p>The AWS System Log lists errors encountered in AWS infrastructure and can give an indication as to problems that may be occurring.</p> <p>When experiencing issues during setup, it is recommended you examine this log. For more information see <a href="#">Get AWS System Log</a> on page 57</p>
	<b>MX and Gateway have outside access</b>	<p>The NAT instance must be configured to enable outside access for a variety of purposes. The following provides an overview of what needs to be configured for the NAT instance:</p> <ul style="list-style-type: none"> <li>• The MX and gateway must have a route table associated with the subnets directing to the NAT Instance - e.g. "0.0.0.0 -&gt; Nat instance id"</li> <li>• The NAT instance must have a public route table connected to the internet gateway - e.g. "0.0.0.0 -&gt; igXXXX instance ID"</li> </ul> <p>Note that the gateway will probably be stuck (in "WaitCondition" state) as part of the first time login if access is not be available</p> <p>You must disable the source/destination check in the NAT instance.</p> <p>For more information, see Amazon documentation on <b>Disabling Source/Destination Checks</b>.</p> <p>For information on configuring a NAT instance, see <a href="#">NAT Instance</a> on page 41.</p>
	<b>Connectivity between Devices</b>	<p>For SecureSphere to properly operate, there needs to be connectivity between its various devices. When encountering issues you should check to verify the below:</p> <ul style="list-style-type: none"> <li>• <b>Security Groups:</b> Needed for relevant ports between the MX, gateway and ELBs. usually ports 8083, 22, 443, 80. For more information on security groups, see <a href="#">Security Groups</a> on page 46.</li> <li>• <b>Subnets and routing:</b> Configured accordingly to allow access. For information on configuring subnets, see <a href="#">Subnets</a> on page 39.</li> <li>• <b>Elastic's IPs:</b> Must be configured to reach within the VPC. Alternatively a VPN can be configured to allow for direct access from within your IP addresses. For information on configuring Elastic IPs, see <a href="#">Elastic IP Address</a> on page 45.</li> </ul>
	<b>ELB is configured to listen to and Forward HTTP Protocol</b>	<p>The Elastic Load Balancer (ELB) must be configured to listen for the HTTP protocol and forward HTTP traffic on the ports used by the SecureSphere gateway and web servers. To verify this is taking place:</p> <ul style="list-style-type: none"> <li>• Make sure that the health check is configured per the recommended guidelines. For information on the ELB Health Check, see <a href="#">Health Check</a> on page 45.</li> <li>• Check that ELBs show instances as in service (Health check are getting response). For more information on ELBs, see <a href="#">External ELB</a> on page 45</li> </ul>

	Item to Verify	Description
	<b>Scaling Group is configured as required and that scaling policies applied there have not been changed</b>	Scaling policies should be based on CPU and Throughput , for 5 minutes polling interval.
	<b>KRP Rules are Configured</b>	KRP rules must be defined so that the KRP will listen to the relevant port. The server IP address should be the IP address associated with the relevant Inner ELB name. For more information on KRP Rules, see <a href="#">Configuring KRP Rules</a> on page 29.
	<b>ec2_auto_ftl.log</b>	A log is available at <code>/var/log/ec2_auto_ftl.log</code> which contains an overview of initial setup of SecureSphere listing the status of tasks including first tome login, creating a new users, setting passwords, asset tag, timezone and more. On-Demand customers can use the command <code>ec2log</code> to display the log file.

## Troubleshooting Errors

The following is a list of errors that may be encountered and suggested resolutions to these errors

Problem	Possible Cause
Instance creation fails (ROLLBACK_COMPLETE)	The reason for the failure is available in the stack's <b>Services &gt; CloudFormation &gt; Events</b> tab. The event shows the reason for the failure. If the event shows a WaitHandle Timeout message, the NAT instance through which communication with AWS takes place may be misconfigured, or the proxy is not configured properly.
Deletion of Management Servers fails (DELETE_FAILED).	Termination Protection is configured by default for Management Servers. To delete the Management Server stack you must manually disable Termination Protection in <b>Services &gt; EC2</b> .
Instance creation of Management Server fails (ROLLBACK_FAILED)	When there is a stack creation failure for a Management Server, which is configured by default with Termination Protection, rollback fails.
Failed connecting to CloudFormation, validate NAT Instance or Proxy Configuration	Displayed in the AWS System Log, this error indicates there is a problem with the NAT configuration. It is recommended that you check NAT settings as described in <a href="#">NAT Instance</a> on page 41.

## Get AWS System Log

The AWS System Log can contain information that will assist you in diagnosing problems you're encountering.

When encountering deployment issues, its always recommended that you download the AWS system log to see if there are any messages.

### To access the AWS System Log:

1. In AWS, under **Instances**, right click the Instance.
2. Under **Instance Settings**, Select **Get System Log**.

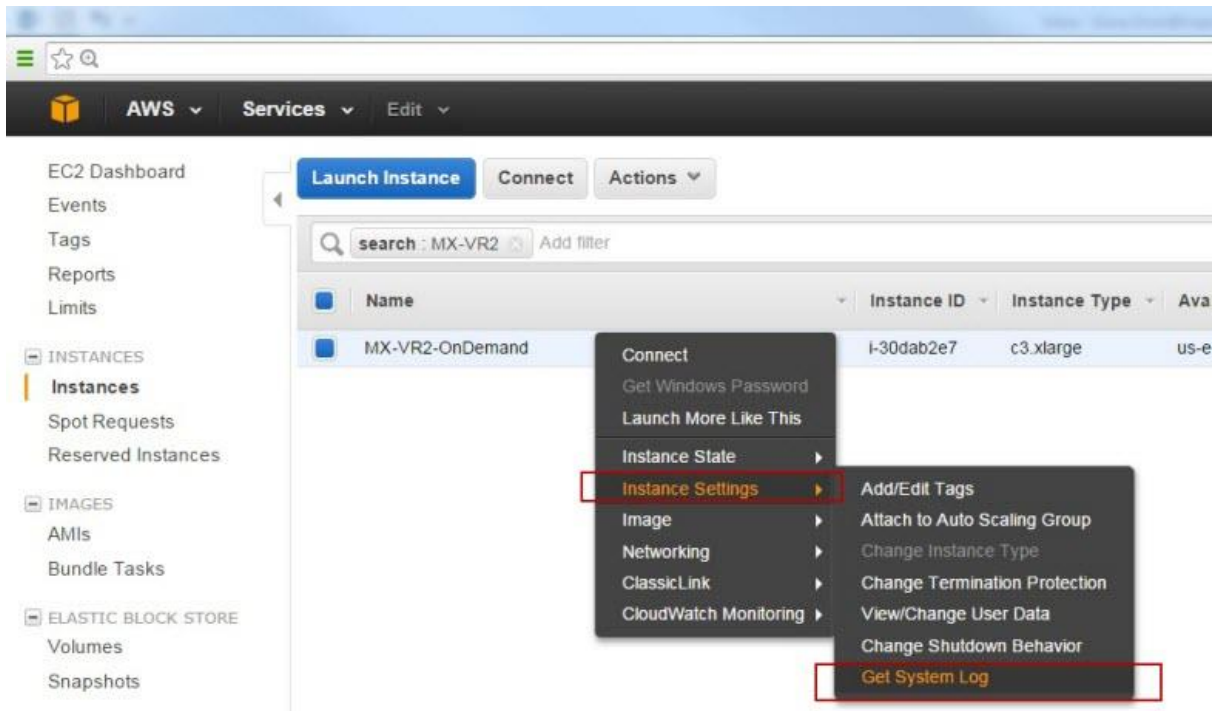


Figure 9: Get System Log

The System Log opens in a separate window as shown below. In this example, the message states "Failed connecting to CloudFormation, validate NAT Instance or Proxy Configuration." So to troubleshoot, you could check NAT instance configuration as described in [NAT Instance](#) on page 41.

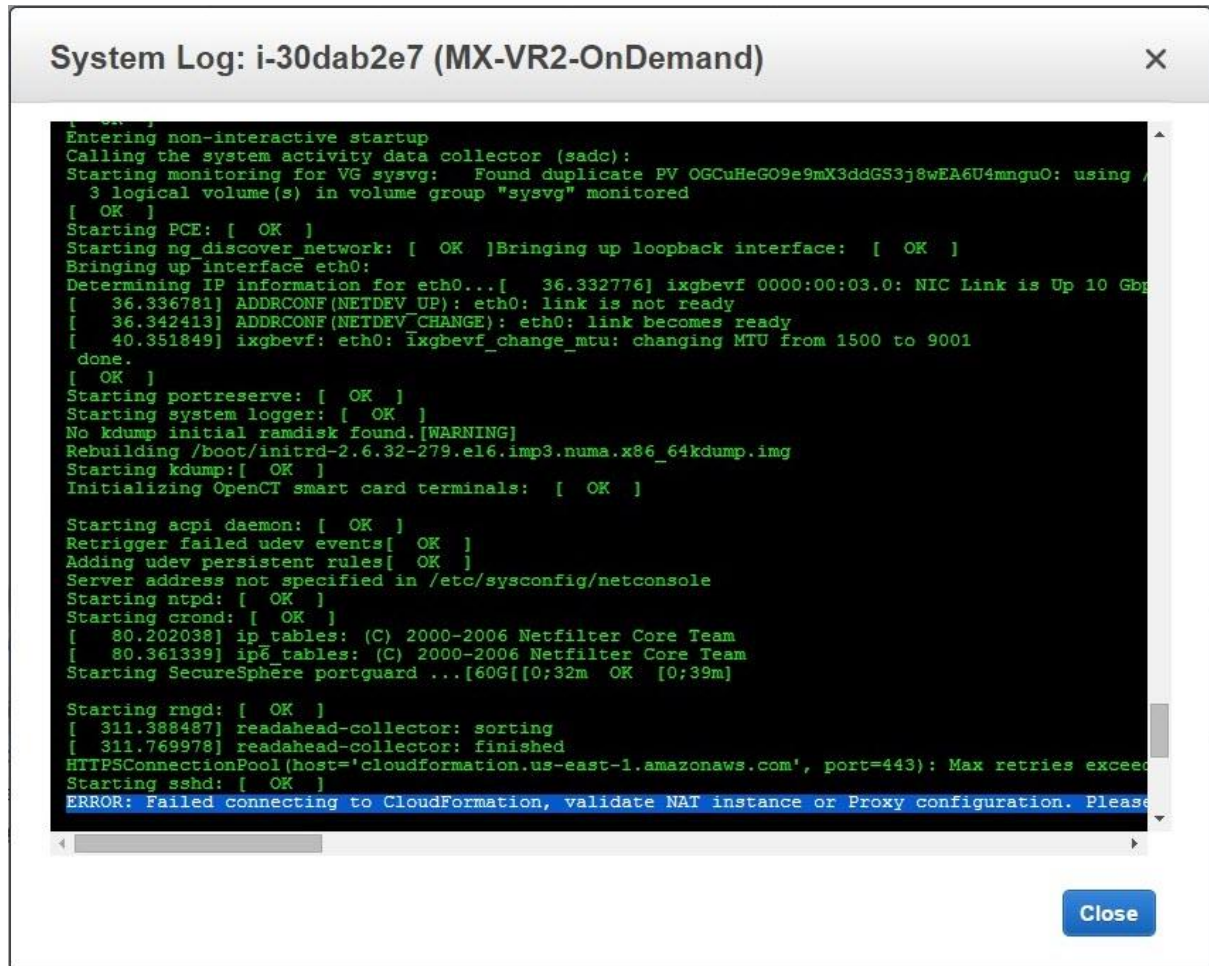


Figure 10: AWS System Log Example

## HTTP Health Check

If the ELB Health Check is configured to use HTTP, the Gateway can be configured to periodically log the health check and its "health status" in a cyclical log. The health check confirms that the connection through the External ELB > Gateway > Internal ELB > Web Server path and back is up, using HTTP packets.

The log file is in the `/proc/hades/http_health_check` directory, and it is limited to 3,000 entries, after which the entries are overwritten cyclically.

If you are using this feature, you should configure it for all Gateway stacks and Gateway Groups managed by the Management Server.

### To configure the HTTP health check:

1. In the **Main** workspace, select **Setup > Gateways**.
2. Select the Gateway group.
3. In the **Details** tab, open the **Advanced Configuration** section.



4. Enter the following text and then click **Save**.

```
<http-health-check-monitoring>
  <health-check-url url="<URL>" interval-sec="<n>" />
</http-health-check-monitoring>
```

For example:

```
<http-health-check-monitoring>
  <health-check-url url="/healthCheck/health.html" interval-sec="300" />
</http-health-check-monitoring>
```

Name	Description
<b>url</b>	<p>The URL of the host whose health is to be checked. You can define multiple URLs, each one on a separate line.</p> <p>Note: It is recommended you create a custom page for the Health Check URL and not use a default page. Otherwise the log may fill up and it may be difficult to identify relevant issues.</p>
<b>interval-sec</b>	The interval in seconds between health checks.

Click **Save**.

The log entries contain the following information:

- timestamp
- details of the IP addresses and ports in the path
- URL
- status

**To delete the HTTP health check:**

1. In the **Main** workspace, select **Setup > Gateways**.
2. Select the Gateway group.
3. In the **Details** tab, open the **Advanced Configuration** section.
4. Delete all the text between the opening and closing `http-health-check-monitoring` tags, so that all that remains is the following, and click **Save**.

```
<http-health-check-monitoring>
</http-health-check-monitoring>
```

## Debugging a Failed Gateway

The Management Server monitors the AWS SQS for requests to terminate a Gateway, which can occur for one of 3 reasons:

- The Gateway instance failed an ELB health check.
- The Gateway instance was scaled down.
- The Gateway instance was manually terminated by the user.

In all of these cases, AWS removes the Gateway from the stack and scales up another Gateway in its place, and the Management Server unregisters the Gateway, so that it is no longer counted against the license.

If the reason for the Gateway instance termination is that the Gateway failed an ELB health check, the following events occur:

- AWS delays terminating the failed Gateway instance for a pre-defined period (up to 30 minutes).
- The Management Server runs the `get-tech-info` command on the failed Gateway (rebooting the Gateway if necessary) and stores the output file locally (on the Management Server).
- The Management Server requests that AWS terminate the failed Gateway instance.

The SecureSphere administrator can then review the `get-tech-info` file to determine the reason for the Gateway's failure.

If the reason for the Gateway instance termination is that the Gateway instance was scaled down or terminated by the user, the Management Server does not generate a `get-tech-info` file but allows AWS to immediately terminate the Gateway instance.

If more than one Gateway instance fails, the Management Server deals with them successively. There can be complications in unusual circumstances, for example, if many Gateways fail at the same time and AWS terminates a failed Gateway instance before the Management Server is able to run `get-tech-info` on it.

During the time a failed Gateway instance remains up pending the retrieval of its `get-tech-info` file and before AWS terminates its instance, the string `"Under_Log_Retrieval"` is appended to its instance name.

## Collecting AWS Data for Troubleshooting

You can collect logs about the operation and status of the AWS environment that can help with troubleshooting. You do this by running the **aws-logs-remote** command. SSH to the Gateway and enter the command into the CLI. Additionally, the command is run automatically when you run Get Tech Info from the Management Server user interface.

The command is to upload AWS logs and configuration to a URL. The syntax of the command is as follows:

```
aws-logs-remote [-h] --protocol {ftp,http,https,scp} [--user USERNAME]
  [--password PASSWORD] [--insecure] [--proxy HOST:PORT]
  [--proxy-user USER:PASSWORD]
  URL
```

mandatory upload flags:

```
--protocol {ftp,http,https,scp}  upload protocol
```

optional upload flags:

```
--user USERNAME          upload server user
```

```
--password PASSWORD      upload server password
```

```
--insecure                allow connections to SSL sites without certs
```

```
--proxy HOST:PORT <host[:port]>  use HTTP proxy on given port
```

```
--proxy-user USER:PASSWORD <user[:password]>  set proxy user and password
```

positional arguments:

```
URL          upload URL address - where file will be sent (e.g. ftp.imperva.com/support/customer_id/,
192.168.1.8/home/user_name/file_name)
```

# APPENDIX B

## Backup and Restore

---

This section review the process of backup and restore, as follows:

Backup 62

Restore 63

### Backup

Backing up the SecureSphere Management Server EBS (the Management Server data) is performed by running a Full System Export and then creating an AWS snapshot. These two actions should be coordinated as follows:

1. Create an Action Set of type Archiving.
2. To the Action Set, attach an action interface of type **AWS Snapshot > Create AWS Snapshot**.
3. Provide the Amazon credentials (Access Key ID and Secret Access Key) for creating the AWS snapshot.
4. Configure the Action Set as an Archiving Action in Full System Export (**Admin > Maintenance > Export Settings**).
5. Schedule the Full System Export.

A system event is issued upon the completion of the Archiving Action.

These actions should be scheduled at regular and frequent intervals and run by a user whose permissions are restricted to taking snapshots.



**Note:** The user requires the following IAM Policy permissions:

- ec2:CreateSnapshot
- ec2>DeleteSnapshot
- ec2:DescribeSnapshots
- ec2:DescribeVolumes

The user must have URL access to the relevant Amazon Region in order to perform the snapshot. See the Amazon documentation for detailed information about defining users and their privileges.

The snapshot is created in the AWS environment. Only the last two snapshots are saved.

## Restore

This section reviews the various procedures involved with restoring a system and includes:

[Management Server 63](#)

[Management Server EBS 63](#)

### Management Server

---

If the SecureSphere Management Server fails, you can restore it as follows:

**To restore the SecureSphere Management Server:**

1. Create a new SecureSphere Management from the AMI as described in [Deploying the SecureSphere Management Server](#) on page 22.
2. Confirm that Management Server still has the same IP address; otherwise the Gateways will be unable to communicate with it.
3. Restore the EBS from the snapshot, as described below.

### Management Server EBS

---

If the SecureSphere Management Server EBS fails, it can be restored from the snapshot.

**To restore the SecureSphere Management Server EBS:**

1. In **AWS EC2 > Snapshots**, from the **Snapshots** page, right-click the snapshot from which to restore the SecureSphere Management Server EBS.
2. Select **Create volume**.
3. In **Type**, select the appropriate volume type, for example, Standard volume.
4. In the **Instances** page, stop the Management Server.
5. Wait for the Management Server to shut down completely.
6. Locate the **volume** used by the Management Server in the **Volumes** page.
7. Right-click the **volume** and select **Detach volume**.
8. Locate the **volume** created from the snapshot and select **Attach volume**.
9. Select the Management Server instance.

10. Select the Device **/dev/sda1**.
11. Click **Attach**.
12. Start the Management Server instance.
13. Connect to the Management Server using SSH.
14. Stop the Management Server with the `impctl server stop` command.
15. Import the export file that was created with the system export function. To import the file use the `full_expimp.sh` utility.
16. The export file location in the snapshot is `/var/tmp/server-backup`.
17. Start the Management Server with the `impctl server start` command.

For more information on exporting and importing the SecureSphere configuration and on starting and stopping the Management Server, see **SecureSphere Administration Guide**.

# APPENDIX C

## Upgrading SecureSphere on AWS

---

This procedure describes how to upgrade SecureSphere on AWS from earlier versions to a later version. It reviews the following topics:

[Upgrading a Management Server 65](#)

[Upgrading a Gateway 68](#)

### Upgrading a Management Server

This is a multi-step process:

- [Bring up a second MX and install the new SecureSphere version on this MX](#)
- [Export the MX configuration.](#)
- [Import the MX configuration to the second MX.](#)
- [Bring down the old MX.](#)

[Exporting the Management Server Configuration 66](#)

[Bringing Up a Second Management Server with the New SecureSphere Version 67](#)

[Importing the Management Server Configuration to the Second Management Server 67](#)

## Exporting the Management Server Configuration



### Notes:

- In order to export the Management Server and conduct the upgrade, you must be using SecureSphere version 10.5 Patch 10 or newer.
- You can upgrade from any version (from version 10.5 Patch 10) to any version.

To export the Management Server configuration, connect to SecureSphere via SSH, then execute the following command:

```
impctl platform export
```

The exported file is named UpgradeExport.tar.gz.zip.

<code>--zip-password=&lt;password&gt;</code>	A password to protect the exported file. Valid password must contain 7-14 letters, digits or * ( ) - + = # % ^ : / ~ . , [ _ ]
<code>--protocol=&lt;protocol&gt;</code>	<protocol> can be one of: local nfs ftp cifs s3

The table below lists the arguments required for each of the possible protocols.

Protocol	Arguments	Explanation
local	<code>--path</code>	
nfs	<code>--path --server</code>	server must be an IP address
ftp	<code>--server --user --password --path</code>	server must be an IP address. This argument is optional.
cifs	<code>--server --user --password --path</code>	server must be an IP address
s3	<code>--awsAccessKey --awsSecretKey --region --bucketName</code>	All the arguments are standard AWS parameters.



## Examples

The following are a number of examples for how to run the Upgrade.

```
impctl platform export --protocol=local --path=/tmp
--zip-password=<password>
```

```
impctl platform export --protocol=nfs --path=/tmp
--server 10.1.2.3 --zip-password=<password>
```

```
impctl platform export --protocol=ftp --server=10.5.6.7
--user=admin --password=123456 --path=/usr/tmp --zip-password=<password>
```

```
impctl platform export --protocol=cifs --server=10.1.2.3
--user=admin --password=123456 --path=/usr/tmp --zip-password=<password>
```

```
impctl platform export --protocol=s3 --awsAccessKey=[awsAccessKey]
--awsSecretKey=[awsSecretKey] --region=[region] --bucketName=[bucketName]
```

## Bringing Up a Second Management Server with the New SecureSphere Version

Deploy a CloudFormation stack from the new CloudFormation templates, just like doing a clean installation of a new version.

## Importing the Management Server Configuration to the Second Management Server

Import the Management Server configuration to the second Management Server by executing the following command:

```
impctl platform import
```

The arguments are the same as for the export step.



**Note:** The imported file must be named UpgradeExport.tar.gz.zip, otherwise SecureSphere won't find the file for import.

## Upgrading a Gateway

As a Gateway is stateless, to upgrade it you must upgrade the gateway stack using the new JSON file which points to the new SecureSphere version AMI.

If you are upgrading from a version earlier than 12.0, verify that the json file's **UseSingleGWGroup** parameter's value is the same as that of the existing stack, before you create the new Gateway stack.



**Note:** When patching/upgrading an AWS Gateway, you must first make sure that the patch procedure does not exceed the number of licensed Gateways. For more information, see [Configuring Auto Scaling for Gateway Patch or Upgrade](#) on page 77.

# APPENDIX D

## Migrating an AWS On Demand Deployment to a BYOL Deployment

---



### Notes:

- Before beginning this procedure, contact Imperva and obtain a BYOL license suitable to your requirements. The individual steps in this procedure are documented in detail elsewhere in this Deployment Guide and in the SecureSphere User and Administration Guides.
- The On Demand license is not supported on AWS GovCloud (US) deployments.

### To migrate an AWS deployment from On-Demand to BYOL:

1. Login to the On-Demand Management Server using `ssh`.
2. Run the CLI `export-remote` command and save the exported file to a remote location.  
You will need the exported file later in this procedure.
3. Using Cloud Formation, create a new BYOL Management Server.
4. Login to the BYOL Management Server using `ssh`.
5. Stop the BYOL Management Server.
6. Run the CLI `import-remote` command and import the file you previously exported.
7. After the import successfully completes, start the BYOL Management Server.
8. Log into the BYOL Management Server GUI.

9. Apply the BYOL license you obtained before you began this procedure (see the note above) to the BYOL Management Server.
10. Remove the individual On-Demand Gateways from the BYOL Gateway screen, but **do not remove the Gateway Group**.
11. Create a new BYOL Gateway stack pointing to the BYOL Management Server.
12. Associate the Gateway stack with the Gateway Group.
13. After determining that the BYOL deployment is functioning correctly, you can stop and terminate the On-Demand deployment.

# APPENDIX E

## Advanced Deployments

---

Advanced deployment options are available.



**Note:** MX-HA is supported with a BYOL license only.

Hybrid Mode 71

AWS Management Server High Availability (MX-HA) Mode 73

### Hybrid Mode

You can deploy Gateways on both AWS (On-Demand and BYOL Gateways) and as standard machines at your data center, while having your management server as a standard SecureSphere machine at your data center. This is known as Hybrid Mode. Hybrid Mode enables you to expand your on-premises setup's capacity by adding Gateways on AWS.



**Note:** Hybrid mode is not supported with MX-HA and MX-DR deployments.

Note the following requirements for Hybrid Mode:

- You must establish network connectivity between the VPC and your data center's network. You can use solutions such as AWS Direct Connect and various VPN options. The Gateway and the management server need to recognize one another's actual IP addresses.
- The communications bandwidth must be no less than 10mb/s. In cases of particularly high load, this could be higher.
- Make sure that the required ports are open between the management server and the gateway:
  - Management server: 8083
  - Gateway: 443.

In addition, for the hybrid mode to work, before deploying the Gateway stack you must edit the Gateway's CloudFormation template (json) file. Doing so causes a new resource **MXUser** to appear in the AWS CloudFormation Resources tab. This resource enables the Gateways on Amazon to communicate with the on-premises MX.

Once set up, the new resource appears in the console as in the image below.

mxaccesskey		AWS::IAM::AccessKey
mxuser	y:2017-08-08T20:02:10.000Z::K9	AWS::IAM::User

#### To configure the CloudFormation template for hybrid mode:

1. Open the Gateway's CloudFormation template file in a text editor.
2. Find the section titled `IsMxPhysical`.
3. Change the `False` entry to `True`.
4. Save the file.
5. Deploy the Gateway's CloudFormation template.

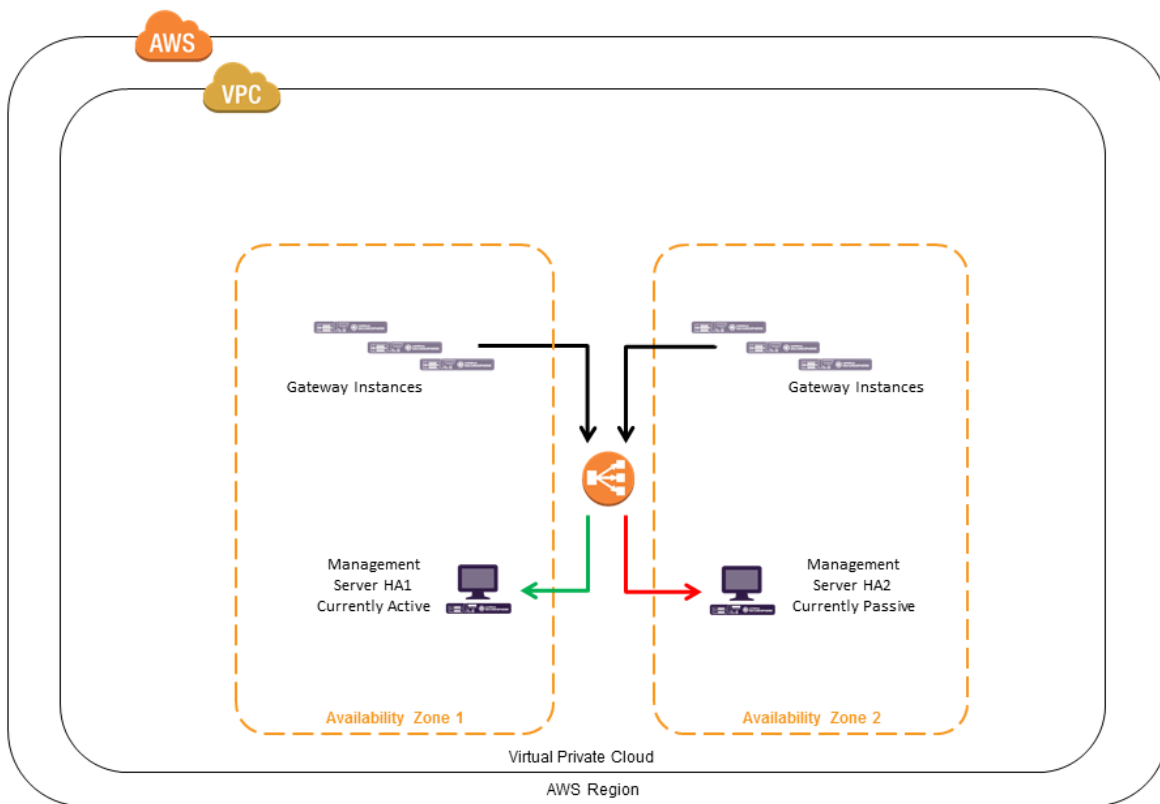
## AWS Management Server High Availability (MX-HA) Mode

With single mode, if a Management Server fails, there is no way to manage the Gateways while the Management Server is down. Gateways continue to monitor traffic, but there are no management capabilities until the Management Server has been restored.

In deployments in which autoscaling is important (e.g. many WAF deployments), Gateways are created as demand increases. However, if the Management Server fails, new Gateways cannot be registered as they are created, and therefore these new Gateways cannot monitor traffic.

Management Server High Availability (MX HA) mode solves these difficulties by providing full HA facilities using two connected Management Server instances. Thus there is no loss of management capability, and new Gateways are automatically registered and can begin to function, even if one of the Management Servers fails.

In SecureSphere's AWS MX HA Mode, two Management Servers are created. The Gateways point to a virtual IP that serves both Management Servers, the HA mechanism knows which machine that represents at any given time, and the standard HA systems - Data Guard, Pacemaker and Corosync carry out their normal functions.



You implement MX HA mode by using the MX HA mode template file. **Management Server, HA:** SecureSphere-Management-MXHA-AWS-CloudFormation-<SecureSphere-Version>-BYOL.json.

When you register a Gateway on a Management Server in MX HA mode, use the DNS address of the ELB instead of the IP address of the Management Server.

**To find the DNS Name of the load balancer:**

1. In AWS, navigate to **EC2 > Load Balancers**.
2. Select the **Stack Name**
3. Select the **Description** tab.
4. Use the entire content of the **DNS Name** field's first line, except the **(A Record)** at the end.



**Notes:**

- In MX HA mode, the license is good for both Management Server instances. You generate one license and upload it to one of the Management Servers.
- MX HA mode is not supported in AWS GovCloud (US) deployments.
- MX HA mode is not supported in the Frankfurt Region.



# APPENDIX F

## Auto Scaling from BYOL to On-Demand Instances

---

If you want to be prepared for a situation in which demand is expected to require even greater capacity than your existing BYOL licenses, you can configure your AWS deployment so that it will automatically add On-Demand instances as necessary, and remove them similarly.



**Note:** Auto-scaling from BYOL to On-Demand instances is supported only when the BYOL stack is configured to a fixed instance count, and the scaling is done by the On-Demand stack only.

### To configure AWS to auto scale from BYOL to On-Demand:

1. Create an On-Demand stack. For more information, see the **SecureSphere WAF on Amazon AWS On-Demand Configuration Guide**.
2. Configure the desired number of fixed BYOL instances:
  - a. In your browser, navigate to your Amazon Web Services page, and log in using your AWS account information.
  - b. Select **EC2 > Auto Scaling Groups**.
  - c. Select the desired BYOL auto scaling group.
  - d. Select the **Details** tab.
  - e. Click the **Edit** button.
  - f. Set the **Min**, **Max** and **Desired** parameters to the same value. It is recommended that this value is the maximum value allowed by the BYOL license..
  - g. Click **Save**.

3. Delete the On-Demand policies:
  - a. Select **EC2 > Auto Scaling Groups**.
  - b. Select the desired On-Demand auto scaling group.
  - c. Select the **Scaling Policies** tab.
  - d. For each policy, click **Actions** then select **Delete**.
4. Configure five new policies on the On-Demand auto scaling group:
  - a. Select **EC2 > Auto Scaling Groups**.
  - b. Select the desired On-Demand auto scaling group.
  - c. Select the **Scaling Policies** tab.
  - d. Click **Add policy**. The **Create Scaling Policy** window appears.
  - e. Enter the name of the new policy. You can enter any name you wish, but it is recommended that you use the alarm names given in the table below, which summarizes the parameters for each of the five new policies you must add.
  - f. From the **Execute policy when** drop down, select the alarm that triggers the policy. The alarms appear in the format <BYOL stack name><alarm name><id>. Refer to the table below.
  - g. Enter values in the **Take the action** fields, in accordance with the **Action** field in the table below.
  - h. In the **Instances need** field, enter **600 seconds to warm up**.
  - i. Click **Create**.
  - j. Repeat steps d to i for each of the five alarms in the table below.

**Auto Scaling Alarms and Actions**

Alarm	Action	Description
<b>NetworkInAlarmHigh</b>	Add 1 instance	Scale-up if the NetworkIn throughput > (70% of max throughput) for 5 minutes
<b>NetworkInAlarmLow</b>	Remove 1 instance	Scale-down if the NetworkIn throughput < (30% of max throughput) for 5 minutes
<b>NetworkOutAlarmHigh</b>	Add 1 instance	Scale-up if the NetworkOut throughput > (70% of max throughput) for 5 minutes
<b>NetworkOutAlarmLow</b>	Remove 1 instance	Scale-down if the NetworkOut throughput < (30% of max throughput) for 5 minutes
<b>CPUALarmHigh</b>	Add 1 instance	Scale-up if CPU > 80% for 5 minutes

# APPENDIX G

## Configuring Auto Scaling for Gateway Patch or Upgrade

---

When you patch or upgrade your AWS Gateways, a new patched or upgraded instance is created, and only subsequently is the old instance terminated.

The number of AWS Gateways you can have is limited by your license. In order to avoid a failure of your patch/upgrade, you need to ensure that the patch or upgrade procedure does not exceed the number of licensed Gateways.

You do this by configuring the relevant auto scaling group so that the number of machines is one less than the number allowed by your license.

### To configure auto scaling for Gateway patch or upgrade:

1. In your browser, navigate to your Amazon Web Services page, and log in using your AWS account information.
2. Select **EC2 > Auto Scaling Groups**.
3. Select the desired BYOL auto scaling group.
4. Select the **Details** tab.
5. Click the **Edit** button.
6. Edit the **Desired** and **Min** fields so that their values are one less than the license capacity.
7. Click **Save**.
8. Perform the patch/upgrade. When you do this, make sure that the value of the **ScalingMinSize** parameter is one less than the license capacity.
9. When you have finished all your patches/upgrades, repeat steps 1 to 6, but this time reset the **Desired** and **Min** fields to their original values. Click **Save**.

# APPENDIX H

## Amazon Instance Type Mapping

---

The following Amazon instance types are supported:

- m3.large
- m3.xlarge
- m3.2xlarge
- c3.large
- c3.xlarge
- c3.2xlarge
- c4.large
- c4.xlarge
- c4.2xlarge

The table below lists the recommended mapping of SecureSphere virtual appliance model numbers and the corresponding **minimum** Amazon Instance Types.

SecureSphere Virtual Appliance Model	SecureSphere Appliance Type	Minimum Amazon Instance Type
AV1000	Gateway	C3.large
AV2500	Gateway	C3.xlarge
AVM150	Management Server	C3.xlarge

# APPENDIX I

## Imperva License Key

---

From version 11.5, by default, machines are launched in sealed mode.

If you want to configure a machine so that it is unsealed - i.e. so that you can act as an Admin user on it - you need to edit the template file.

### To configure an unsealed machine:

1. Open the JSON file for the machine you are configuring.
2. In the row with **ImpervalicenseKey**, replace **Null** with the license key you were given.
3. Use the edited template file to set up the machine.

If, and only if, you did not unseal the machine at setup by editing the JSON, you can unseal it subsequently, using the **unlock** command.

### To unseal a machine after setup:

1. SSH to the machine.
2. Type  
`unlock <license key>`  
and hit **Enter**.



### Notes:

- For the unlock to take effect, reconnect to the SSH.
- Since Gateways are scalable, it is recommended that you use the JSON file to unlock them.

# APPENDIX J

## Code Samples

---

Create Default Reverse Proxy Rule 80

### Create Default Reverse Proxy Rule

For more information on the functions, refer to the [SecureSphere OpenAPI Guide](#).

In Bash 81

In Python 82

## In Bash

---

```
#!/bin/sh
# set some globals
USER="myuser"
PASS="mypassword"
MX="my.mx.com"
# login and retrieve auth token
AUTH=`echo -n "$USER:$PASS" | base64`
JSESSIONID=`curl -sik -X POST
https://$MX:8083/SecureSphere/api/v1/auth/session -H "Authorization: Basic
$AUTH" | grep "session-id" | sed 's/^.*=//' | sed 's/\\".*$//'\`
# create server group
curl -sik -X POST -H "Cookie: JSESSIONID=$JSESSIONID"
https://$MX:8083/SecureSphere/api/v1/conf/serverGroups/Default%20Site/Default%
20Server%20Group
# create web service
curl -sik -X POST -H "Cookie: JSESSIONID=$JSESSIONID" -H "Content-Type:
application/json" -H "Accept: application/json" -d
'{"ports":[80],"sslPorts":[443]}'
https://$MX:8083/SecureSphere/api/v1/conf/webServices/Default%20Site/Default%2
0Server%20Group/web
# create default KRP rule
curl -vvsik --trace-ascii -X PUT -H "Cookie: JSESSIONID=$JSESSIONID" -H
"Content-Type: application/json" -H "Accept: application/json" -d
'{"outboundRules":
{"10":
{"externalHost":"Any","internalIpHost":"www.imperva.com","serverPort":80,"enchr
ypt":false}
}}
'https://$MX:8083/SecureSphere/api/v1/conf/webServices/$NEW_SITE_NAME/$NEW_SG_
NAME/$NEW_SERVICE_NAME/krpInboundRules/$GATEWAY_GROUP/$ALIAS/$LISTENING_PORT
```

## In Python

---

```
#!/usr/bin/python
import base64
import requests
import json
import sys
# MX Settings
SERVER      = <MX IP>
USER        = <myusername>
PASSWORD    = <mypassword>
# Disable warnings caused by unknown SSL certificate
requests.packages.urllib3.disable_warnings()
# Function to handle MX transactions
def mx_post(path, **kwargs):
    baseurl = 'https://%s:8083/SecureSphere/api/v1' % SERVER
    try:
        res = requests.post(baseurl + path, verify=False, **kwargs)
        if res.text:
            res_json = json.loads(res.text)
        else:
            res_json = {}
    except:
        print "ERROR: Network connection failure"
        sys.exit(1)

    if 'errors' in res_json:
        print "ERROR: MX returned failure - "
        for item in res_json['errors']:
            for key, value in item.items():
                print "%s: %s" % (key, value)
        sys.exit(2)

    return res_json

# Connect to MX
auth_header = {'Authorization': 'Basic %s' % base64.b64encode('%s:%s' % (USER, PASSWORD))}
path = '/auth/session'
res = mx_post(path, headers=auth_header)
try:
    session_key, session_value = res['session-id'].split("=")
    cookie = {session_key: session_value}
except:
```



```
print "ERROR: MX did not return session ID"
print res
# Create Server Group
site = 'Default%20Site'
server_group = 'Default%20Server%20Group2'
path = '/conf/serverGroups/%s/%s' % (site, server_group)
mx_post(path, cookies=cookie)
# Create Web Service
web_service = 'web'
body = {'ports': ['80']}
path = '/conf/webServices/%s/%s/%s' % (site, server_group, web_service)
mx_post(path, cookies=cookie, json=body)
# Create Default KRP Rule
rule = {'1': {'externalHost': 'Any', 'internalIpHost': 'www.imperva.com', 'serverPort': 80}}
body = {'outboundRules': rule}
rule_name = 'us-east1/AWS%20Default/80'
rule_name = 'Cluster'
path = '/conf/webServices/%s/%s/%s/krpInboundRules/%s' % (site, server_group, web_service, rule_name)
mx_post(path, cookies=cookie, json=body)
```

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