

# Junosphere

## Junosphere User Guide

Release

# 1.4

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For disclosure information on Junosphere Connector, please refer to the files located via the following link.

<http://www.juniper.net/support/products/junosphereconnector>

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## Terms of Use – Junosphere

THIS TERMS OF USE AGREEMENT (“**AGREEMENT**”) GOVERNS YOUR USE OF THE SERVICES. IF YOU PURCHASE OUR SERVICES, THIS AGREEMENT WILL ALSO GOVERN YOUR PURCHASE AND ONGOING USE OF THOSE SERVICES. BY ACCEPTING THIS AGREEMENT, EITHER BY CLICKING A BOX INDICATING YOUR ACCEPTANCE OR BY EXECUTING AN ORDER FORM THAT REFERENCES THIS AGREEMENT, YOU AGREE TO THE TERMS OF THIS AGREEMENT. IF YOU ARE ENTERING INTO THIS AGREEMENT ON BEHALF OF A COMPANY OR OTHER LEGAL ENTITY, YOU REPRESENT THAT YOU HAVE THE AUTHORITY TO BIND SUCH ENTITY AND ITS AFFILIATES TO THESE TERMS AND CONDITIONS, IN WHICH CASE THE TERMS “YOU” OR “YOUR” SHALL REFER TO SUCH ENTITY AND ITS AFFILIATES. IF YOU DO NOT HAVE SUCH AUTHORITY, OR IF YOU DO NOT AGREE WITH THESE TERMS AND CONDITIONS, YOU MUST NOT ACCEPT THIS AGREEMENT AND MAY NOT USE THE SERVICES.

You may not access the Services if you are our direct competitor, except with our prior written consent. In addition, You may not access the Services for purposes of monitoring their availability, performance or functionality, or for any other benchmarking or competitive purposes.

This Agreement is effective between You and Us as of the date of You accepting this Agreement.

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### 1. DEFINITIONS

**"Affiliate"** means any entity and its successors which directly or indirectly controls, is controlled by, or is under common control with the subject entity. **"Control,"** for purposes of this definition, means direct or indirect ownership or control of more than 50% of the voting interests of the subject entity. An entity shall be considered an Affiliate only so long as such entity continues to meet the foregoing definition.

**"Applications"** means the online applications that interoperate with the Services, located on Juniper designated websites.

**"Malicious Code"** means viruses, worms, time bombs, Trojan horses and other harmful or malicious code, files, scripts, agents or programs.

**"Order Form"** means the ordering documents for purchases hereunder, including addenda thereto, that are entered into between You and Us from time to time. Order Forms shall be deemed incorporated herein by reference.

**"Purchased Services"** means Services that You or Your Affiliates purchase under an Order Form, as distinguished from those provided pursuant to a free trial.

**"Services"** means the online, Web-based applications and platform provided by Juniper via Juniper designated websites (including as described in the User Guide), that are ordered by You as part of a free trial or Purchased Services, including associated offline components but excluding Third Party Applications.

**"Software"** means the program modules and features of any Juniper or Juniper-supplied software. “Software” also includes updates, upgrades and new releases of such software.

**"Third-Party Applications"** means online, Web-based applications and offline software products that are provided by third parties, interoperate with the Services, and are identified as third-party applications.

**"User Guide"** means the online user guide and data sheets for the Services, accessible via a Juniper designated website as updated from time to time. You acknowledge that You have had the opportunity to review the User Guide.

**"Users"** means individuals who are authorized by You to use the Services, for whom subscriptions to a Service have been purchased, and who have been supplied user identifications and passwords by You (or by Us at Your request). Users may include but are not limited to Your employees, consultants, contractors and agents; or third parties with which You transact business.

**"We," "Us," "Our" or "Juniper"** means the Juniper Networks (U.S.), Inc. 1194 North Mathilda Avenue Sunnyvale, CA 94089-1206 and its Affiliates.

**"You" or "Your"** means the company or other legal entity for which you are accepting this Agreement, and Affiliates of that company or entity.

**"Your Data"** means all electronic data or information submitted by You to the Purchased Services.

### 2. FREE TRIAL

We may make one or more Services available to You on a trial basis free of charge until the earlier of (a) the end of the free trial period for which you registered or are registering to use the applicable Service or (b) the start date of any Purchased Services ordered by You. Additional trial terms and conditions may appear on the trial registration web page. Any such additional terms and conditions are incorporated into this Agreement by reference and are legally binding.

**ANY DATA YOU ENTER INTO THE SERVICES, AND ANY CUSTOMIZATIONS MADE TO THE SERVICES BY OR FOR YOU, DURING YOUR FREE TRIAL WILL BE PERMANENTLY LOST UNLESS YOU EXPORT AND SAVE THE DATA FROM JUNIPER’S DESIGNATED WEBSITE.**

**NOTWITHSTANDING SECTION 9 (WARRANTIES AND DISCLAIMERS), DURING THE FREE TRIAL THE SERVICES ARE PROVIDED “AS-IS” WITHOUT ANY WARRANTY.**

Please review the User Guide during the trial period so that You become familiar with the features and functions of the Services before You make Your purchase.

### 3. PURCHASED SERVICES

**3.1. Provision of Purchased Services.** Provision of Purchased Services. We shall make the Purchased Services available to You pursuant to this Agreement and the relevant Order Forms during a subscription term. You agree that Your purchases hereunder are neither contingent on the delivery of any future functionality or features nor dependent on any oral or written public comments made by Us regarding future functionality or features.

**3.2. User Subscriptions.** Unless otherwise specified in the applicable Order Form, (i) Services are purchased as User subscriptions and may be accessed by no more than the specified number of Users, (ii) additional User subscriptions may be added during the subscription term at the same pricing as that for the pre-existing subscriptions, prorated for the remainder of the subscription term in effect at the time the additional User subscriptions are added, and (iii) the added User subscriptions shall terminate on the same date as the pre-existing subscriptions. User subscriptions are for designated Users and cannot be shared or used by more than one User but may be reassigned to new Users replacing former Users who no longer require ongoing use of the Services.

### 4. USE OF THE SERVICES

**4.1 Our Responsibilities.** We shall: (i) provide to You basic support for the Purchased Services at no additional charge, (ii) use commercially reasonable efforts to make the Purchased Services available 24 hours a day, 7 days a week, except for: (a) planned downtime of which We shall give at least 8 hours notice via the Purchased Services, or (b) any unavailability caused by circumstances beyond Our reasonable control, including without limitation, acts of God, acts of government, flood, fire, earthquakes, civil unrest, acts of terror, strikes or other labor problems (other than those involving Our employees), or Internet service provider failures or delays, and (iii) provide the Purchased Services only in accordance with applicable laws and government regulations.

**4.2. Your Responsibilities.** You shall (i) be responsible for Users' compliance with this Agreement, (ii) be solely responsible for the accuracy, quality, integrity and legality of Your Data and of the means by which You acquired Your Data, (iii) use commercially reasonable efforts to prevent unauthorized access to or use of the Services, and notify Us promptly of any such unauthorized access or use, and (iv) use the Services only in accordance with the User Guide, applicable data sheets and applicable laws and government regulations. You shall not (a) make the Services available to anyone other than Users, (b) sell, resell, rent or lease the Services, (c) use the Services to store or transmit infringing, libelous, or otherwise unlawful or tortious material, or to store or transmit material in violation of third-party privacy rights, (d) use the Services to store or transmit Malicious Code, (e) interfere with or disrupt the integrity or performance of the Services or third-party data contained therein, or (f) attempt to gain unauthorized access to the Services or their related systems or networks.

**4.3. Usage Limitations.** Junosphere permits customers to create virtual networks for, among other things, qualification and configuration testing. PLEASE NOTE: VIRTUAL NETWORKING DEVICES CREATED IN JUNOSPHERE WILL NOT HAVE THE SAME PERFORMANCE METRICS AS ACTUAL JUNIPER PRODUCTS DEPLOYED IN YOUR NETWORKS. Services may be subject to other limitations, such as, for example, limits on disk storage space. VIRTUAL NETWORKING DEVICES ARE NOT INTENDED TO BE USED IN "LIVE," PRODUCTION NETWORKS AND INSTEAD SHOULD ONLY BE USED IN CONJUNCTION WITH LAB NETWORKING ENVIRONMENTS.

### 5. THIRD-PARTY PROVIDERS

**5.1. Acquisition of Third-Party Products and Services.** We may offer Third-Party Applications for use in Junosphere. Any other acquisition by You of third-party products or services, including but not limited to Third-Party Applications and implementation, customization and other consulting services, and any exchange of data between You and any third-party provider, is solely between You and the applicable third-party provider. We do not warrant or support Third-Party Applications whether or not they are designated by Us as "certified" or otherwise. No purchase of third-party products or services is required to use the Services.

**5.2. Disclaimer.** Any Third-Party Applications provided on Junosphere are provided "as is," with no warranties, or telephone or other type of support.

### 6. FEES AND PAYMENT FOR PURCHASED SERVICES

**6.1. User Fees.** You shall pay all fees specified in all Order Forms hereunder. Except as otherwise specified herein or in an Order Form, (i) fees are quoted and payable in United States dollars (ii) fees are based on Services purchased and not actual usage, (iii) payment obligations are non-cancelable and fees paid are non-refundable, and (iv) the number of User Subscriptions purchased cannot be decreased during the relevant subscription term stated on the Order Form.

**6.2. Invoicing and Payment.** You will provide Us with a valid purchase order or alternative document reasonably acceptable to Us. We do not accept credit card payments at this time. We will invoice You in advance and otherwise in accordance with the relevant Order Form. Unless otherwise stated in the Order Form, invoiced charges are due net 30 days from the invoice date. You are responsible for maintaining complete and accurate billing and contact information in the Services.

**6.3. Overdue Charges.** If any invoiced charges are not received from You by the due date, then at Our discretion, (a) such charges may accrue late interest at the rate of 1.5% of the outstanding balance per month, or the maximum rate permitted by law, whichever is lower, from the date such payment was due until the date paid, and/or (b) We may condition future subscription renewals and Order Forms on payment terms shorter than those specified in Section 6.2 (Invoicing and Payment).

**6.4. Suspension of Service and Acceleration.** If any amount owing by You under this or any other agreement for Our services is 30 or more days overdue, We may, without limiting Our other rights and remedies, accelerate Your unpaid fee obligations under such agreements so that all such obligations become immediately due and payable, and suspend Our Services to You until such amounts are paid in full.

**6.5. Payment Disputes.** We shall not exercise Our rights under Section 6.3 (Overdue Charges) or 6.4 (Suspension of Service and Acceleration) if the applicable charges are under reasonable and good-faith dispute and You are cooperating diligently to resolve the dispute.

## 7. PROPRIETARY RIGHTS; SOFTWARE

**7.1. Reservation of Rights.** Subject to the limited rights expressly granted hereunder, We reserve all rights, title and interest in and to the Services, including all related intellectual property rights. No rights are granted to You hereunder other than as expressly set forth herein.

**7.2. Restrictions.** You shall not (i) permit any third party to access the Services except as permitted herein or in an Order Form, (ii) create derivative works based on the Services, (iii) copy, frame or mirror any part or content of the Services, other than copying or framing on Your own intranets or otherwise for Your own internal business purposes, (iv) reverse engineer the Services, or (v) access the Services in order to (a) build a competitive product or service, or (b) copy any features, functions or graphics of the Services.

**7.3. Ownership of Your Data.** As between Us and You, You exclusively own all rights, title and interest in and to all of Your Data.

**7.4. Suggestions.** We shall have a royalty-free, worldwide, transferable, sublicenseable, irrevocable, perpetual license to use or incorporate into the Services or Software any suggestions, enhancement requests, recommendations or other feedback provided by You, including Users, relating to the operation of the Services.

**7.5. Federal Government End Use Provisions.** We provide the Services, including related software and technology, for ultimate federal government end use solely in accordance with the following: Government technical data and software rights related to the Services include only those rights customarily provided to the public as defined in this Agreement. This customary commercial license is provided in accordance with FAR 12.211 (Technical Data) and FAR 12.212 (Software) and, for Department of Defense transactions, DFAR 252.227-7015 (Technical Data – Commercial Items) and DFAR 227.7202-3 (Rights in Commercial Computer Software or Computer Software Documentation). If a government agency has a need for rights not conveyed under these terms, it must negotiate with Us to determine if there are acceptable terms for transferring such rights, and a mutually acceptable written addendum specifically conveying such rights must be included in any applicable contract or agreement.

**7.6. Software downloads.** You will be required to download Software to enable you to connect securely with Junosphere and use the Services. The terms and conditions governing Your right to use such Software are set forth in Schedule A.

## 8. CONFIDENTIALITY

**8.1. Definition of Confidential Information.** As used herein, "Confidential Information" means all confidential information disclosed by a party ("Disclosing Party") 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. Your Confidential Information shall include Your Data; Our Confidential Information shall include the Services and Software; and Confidential Information of each party shall include the terms and conditions of this Agreement and all Order Forms, as well as business and marketing plans, technology and technical information, product plans and designs, and business processes disclosed by such party. However, Confidential Information (other than Your Data) 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) is received from a third party without breach of any obligation owed to the Disclosing Party, or (iv) was independently developed by the Receiving Party.

**8.2. Protection of Confidential Information.** Except as otherwise permitted in writing by the Disclosing Party, (i) the Receiving Party shall use the same degree of care that it uses to protect the confidentiality of its own confidential information of like kind (but in no event less than reasonable care) not to disclose or use any Confidential Information of the Disclosing Party for any purpose outside the scope of this Agreement, and (ii) the Receiving Party shall limit access to Confidential Information of the Disclosing Party to those of its employees, contractors and agents who need such access for purposes consistent with this Agreement and who have signed confidentiality agreements with the Receiving Party containing protections no less stringent than those herein.

**8.3. Protection of Your Data.** Without limiting the above, We shall maintain appropriate administrative, physical, and technical safeguards for protection of the security, confidentiality and integrity of Your Data. We shall not (a) modify Your Data, (b) disclose Your Data except as compelled by law in accordance with Section 8.4 (Compelled Disclosure) or as expressly permitted in writing by You, or (c) access Your Data except to provide the Services or prevent or address service or technical problems, or at Your request in connection with customer support matters.

**8.4. Compelled Disclosure.** The Receiving Party may disclose Confidential Information of the Disclosing Party if it is compelled by law to do so, provided the Receiving Party gives the Disclosing Party prior notice of such compelled disclosure (to the extent legally permitted) and reasonable assistance, at the Disclosing Party's cost, if the Disclosing Party wishes to contest the disclosure. If the Receiving Party is compelled by law to disclose the Disclosing Party's Confidential Information as part of a civil proceeding to which the Disclosing Party is a party, and the Disclosing Party is not contesting the disclosure, the Disclosing Party will reimburse the Receiving Party for its reasonable cost of compiling and providing secure access to such Confidential Information.

**8.5. Injunctive Relief.** In the event of a threatened or actual breach of this Section 8, the non-breaching party shall be entitled to seek immediate injunctive or other equitable relief, in addition to, and not in lieu of, any other available remedies.

## 9. WARRANTIES AND DISCLAIMERS

**9.1. Our Warranties.** We warrant that (i) the Services shall perform materially in accordance with the User Guide and applicable data sheets, and (ii) the functionality of the Services will not be materially decreased during a subscription term. For any breach of either such warranty, Your exclusive remedy shall be as provided in Section 12.3 (Termination for Cause) and Section 12.4 (Refund or Payment upon Termination) below.

**9.2. Mutual Warranties.** You represent and warrant that (i) You the legal power to enter into this Agreement, and (ii) You will not transmit to Us any Malicious Code.

**9.3. Disclaimer.** THIS SITE AND ALL INFORMATION, CONTENT, MATERIALS, PRODUCTS (INCLUDING SOFTWARE) AND SERVICES INCLUDED ON OR OTHERWISE MADE AVAILABLE TO YOU THROUGH THIS SITE ARE PROVIDED BY JUNIPER ON AN "AS IS" AND "AS AVAILABLE" BASIS, UNLESS OTHERWISE SPECIFIED IN WRITING. EXCEPT AS EXPRESSLY PROVIDED HEREIN, NEITHER PARTY MAKES ANY WARRANTIES OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, AND EACH PARTY SPECIFICALLY DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW.

**9.4 YOUR DATA.** ANY DATA YOU ENTER INTO THE SERVICES, AND ANY CUSTOMIZATIONS MADE TO THE SERVICES BY OR FOR YOU WILL BE PERMANENTLY LOST UNLESS YOU EXPORT AND SAVE THE DATA FROM JUNIPER'S DESIGNATED WEBSITE. WE DO NOT GUARANTEE THAT YOUR DATA WILL NOT BE SUBJECT TO MISAPPROPRIATION, LOSS OR DAMAGE AND WE WILL NOT BE LIABLE IF IT IS. YOU ARE RESPONSIBLE FOR MAINTAINING APPROPRIATE SECURITY, PROTECTION AND BACKUP OF YOUR DATA. The Services may provide Juniper with information relating to your use and performance of the Services, as well as information regarding the devices on which you download and use Services. For example, this information may include the device type, mobile network connectivity, location of the device, information about when the Service is launched, individual session lengths for use of the Service, or occurrences of technical errors. Any information we receive is subject to the Juniper privacy notice located at [www.juniper.net/us/en/privacy-policy](http://www.juniper.net/us/en/privacy-policy). You must ensure that you have all the necessary rights in Your Data that permit you to use the Service without infringing the rights of any copyright owners, violating any applicable laws or violating the terms of any license or agreement to which you are bound.

**9.5 VIRTUAL NETWORK PERFORMANCE LIMITATIONS.** VIRTUAL NETWORKING DEVICES CREATED IN JUNOSPHERE WILL NOT HAVE THE SAME PERFORMANCE METRICS AS ACTUAL JUNIPER PRODUCTS DEPLOYED IN YOUR NETWORKS.

## **10. INDEMNIFICATION**

**10.1. Indemnification by You.** You shall defend Us against any Claim made or brought against Us by a third party alleging that Your Data, or Your use of the Services in violation of this Agreement, infringes or misappropriates the intellectual property rights of a third party or violates applicable law, and shall indemnify Us for any damages finally awarded against, and for reasonable attorney's fees incurred by, Us in connection with any such Claim; provided, that We (a) promptly give You written notice of the Claim; (b) give You sole control of the defense and settlement of the Claim (provided that You may not settle any Claim unless the settlement unconditionally release Us of all liability); and (c) provide to You all reasonable assistance, at Our expense.

**10.2. Exclusive Remedy.** This Section 10 (Indemnification) states the indemnifying party's sole liability to, and the indemnified party's exclusive remedy against, the other party for any type of Claim described in this Section.

## **11. LIMITATION OF LIABILITY**

**11.1. LIMITATION OF LIABILITY. EXCEPT FOR LIABILITY ARISING FROM YOUR UNAUTHORIZED USE OF THE NETWORK OR UNAUTHORIZED USE, DISTRIBUTION OR REMOVAL OF SOFTWARE, OR YOUR BREACHES OF SECTION 8, "CONFIDENTIALITY,"** IN NO EVENT SHALL EITHER PARTY'S AGGREGATE LIABILITY ARISING OUT OF OR RELATED TO THIS AGREEMENT, WHETHER IN CONTRACT, TORT OR UNDER ANY OTHER THEORY OF LIABILITY, EXCEED THE TOTAL AMOUNT PAID BY YOU HEREUNDER OR, WITH RESPECT TO ANY SINGLE INCIDENT, THE LESSER OF \$100,000 OR THE AMOUNT PAID BY YOU HEREUNDER IN THE 12 MONTHS PRECEDING THE INCIDENT. THE FOREGOING SHALL NOT LIMIT YOUR PAYMENT OBLIGATIONS UNDER SECTION 6 (FEES AND PAYMENT FOR PURCHASED SERVICES).

**11.2. EXCLUSION OF CONSEQUENTIAL AND RELATED DAMAGES.** IN NO EVENT SHALL EITHER PARTY HAVE ANY LIABILITY TO THE OTHER PARTY FOR ANY LOST PROFITS OR REVENUES OR FOR ANY INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, COVER OR PUNITIVE DAMAGES HOWEVER CAUSED, WHETHER IN CONTRACT, TORT OR UNDER ANY OTHER THEORY OF LIABILITY, AND WHETHER OR NOT THE PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE FOREGOING DISCLAIMER SHALL NOT APPLY TO THE EXTENT PROHIBITED BY APPLICABLE LAW.

## **12. TERM AND TERMINATION**

**12.1. Term of Agreement.** This Agreement commences on the date You accept it and continues until all User Subscriptions granted in accordance with this Agreement have expired or been terminated. If You elect to use the Services for a free trial period and do not purchase a subscription before the end of that period, this Agreement will terminate at the end of the free trial period.

**12.2. Term of Purchased User Subscriptions.** User Subscriptions purchased by You commence on the start date specified in the applicable Order Form and continue for the subscription term specified therein.

**12.3. Termination for Cause.** A party may terminate this Agreement for cause: (i) upon 30 days written notice to the other party of a material breach if such breach remains uncured at the expiration of such period, or (ii) if the other party becomes the subject of a petition in bankruptcy or any other proceeding relating to insolvency, receivership, liquidation or assignment for the benefit of creditors.

**12.4. Refund or Payment upon Termination.** Upon any termination for cause by You, We shall refund You any prepaid fees covering the remainder of the term of all User Subscriptions after the effective date of termination. Upon any termination for cause by Us, You shall pay any unpaid fees covering the remainder of the term of all Order Forms after the effective date of termination. In no event shall any termination relieve You of the obligation to pay any fees payable to Us for the period prior to the effective date of termination.

**12.5. Return of Your Data.** You must download any and all of Your Data within 30 days after the effective date of termination of a Purchased Services subscription. After such 30-day period, We shall have no obligation to maintain or provide any of Your Data and shall thereafter, unless legally prohibited, delete all of Your Data in Our systems or otherwise in Our possession or under Our control. **ANY DATA YOU ENTER INTO THE PURCHASED SERVICES, AND ANY CUSTOMIZATIONS MADE TO THE SERVICES BY OR FOR YOU, WILL BE PERMANENTLY LOST UNLESS YOU EXPORT AND SAVE THE DATA FROM JUNIPER'S DESIGNATED WEBSITE.**

**12.6. Surviving Provisions.** Section 6 (Fees and Payment for Purchased Services), 7 (Proprietary Rights), 8 (Confidentiality), 9.3 (Disclaimer), 10 (Indemnification), 11 (Limitation of Liability), 12.4 (Refund or Payment upon Termination), 12.5 (Return of Your Data), 13 (General Provisions) shall survive any termination or expiration of this Agreement.

## **13. General Provisions**

**13.1 Privacy.** This Agreement incorporates by reference the Juniper privacy notice posted at [www.juniper.net/us/en/privacy-policy](http://www.juniper.net/us/en/privacy-policy).

**13.2 Taxes.** All prices and license fees payable under this agreement are exclusive of tax. Customer shall be responsible for paying taxes arising from the purchase of the products, license, or importation or use of the Software. If applicable, valid exemption documentation for each taxing jurisdiction shall be provided to Juniper prior to invoicing, and Customer shall promptly notify Juniper if their exemption is revoked or modified. All payments made by Customer shall be net of any applicable withholding tax. Customer will provide reasonable assistance to Juniper in connection with such withholding taxes by promptly: providing Juniper with valid tax receipts and other required documentation showing Customer's payment of any withholding taxes; completing appropriate applications that would reduce the amount of withholding tax to be paid; and notifying and assisting Juniper in any audit or tax proceeding related to transactions hereunder. Customer shall comply with all applicable tax laws and regulations, and Customer will promptly pay or reimburse Juniper for all costs and damages related to any liability incurred by Juniper as a result of Customer's non-compliance or delay with its responsibilities herein. Neither party shall be liable for taxes or assessments on the other party's net income, gross income, capital, net worth, franchise, privilege, property, or any similar taxes or assessments. Customer's obligations under this Section shall survive termination or expiration of this Agreement.

**13.3 Governing Law; Jurisdiction.** This Agreement shall be interpreted and governed by the laws of the State of California without reference to its conflict of laws principles. The provisions of the United Nations Convention on the International Sale of Goods shall not apply to this Agreement. For any disputes arising out of this Agreement, the parties consent to the personal and exclusive jurisdiction of, and venue in, the state and federal courts within Santa Clara County, California.

**13.4 Entire Agreement.** The terms and conditions contained in this Agreement constitute the entire agreement between the parties and supersede all previous and/or contemporaneous agreements and understandings, whether oral or written, between the parties hereto with respect to the subject matter of this Agreement, including but not limited to any preprinted terms on purchase orders, invoices, advertising and sales literature.

**13.5 Force Majeure.** Except for Customer's payment obligations, neither party will be responsible for any failure to perform due to causes beyond its reasonable control.

**13.6 Assignment.** Customer may not assign or delegate or otherwise transfer its licenses, rights or duties under this Agreement except with prior written consent of Juniper Networks. Any prohibited assignment will be void. Subject to the foregoing, this Agreement shall be binding upon and inure to the benefit of the parties thereto and successors and assigns.

**13.7 Notices.** All notices and other communications pertaining to this Agreement shall be in writing and shall be deemed delivered upon personal delivery or three days after deposit in U.S. mail via certified mail, return receipt requested, postage prepaid. All notices of communications between Customer and Juniper Networks pertaining to this Agreement shall be directed to the address specified on the last page of this Agreement.

**13.9 Amendment; Waiver.** Neither modification to this Agreement, nor any waiver of any rights shall be effective unless assented to in writing by the party to be charged and the waiver of any other right hereunder or any subsequent breach or default.

**13.10 Severability.** If any portion of this Agreement is held invalid, the parties agree that such invalidity shall not affect the validity of the remaining portions of this Agreement, and the parties shall seek in good faith to agree to substitute for the invalid provision a valid provision that most closely approximates the economic effect and intent of the invalid provision.

**13.11 Counterparts.** This Agreement may be signed in counterparts each of which shall be deemed an original and together shall constitute one and the same agreement.

## **SCHEDULE A**

### **END USER LICENSE AGREEMENT**

**READ THIS END USER LICENSE AGREEMENT (“AGREEMENT”) BEFORE DOWNLOADING, INSTALLING, OR USING THE SOFTWARE. JUNIPER IS WILLING TO LICENSE THE SOFTWARE TO YOU ONLY IF YOU ACCEPT ALL OF THE TERMS CONTAINED IN THIS AGREEMENT.** BY DOWNLOADING, INSTALLING, OR USING THE SOFTWARE OR OTHERWISE EXPRESSING YOUR AGREEMENT TO THE TERMS CONTAINED HEREIN, YOU INDIVIDUALLY AND ON BEHALF OF THE BUSINESS OR OTHER ORGANIZATION THAT YOU REPRESENT CONSENT TO BE BOUND BY THIS AGREEMENT. IF YOU DO NOT OR CANNOT AGREE TO THE TERMS CONTAINED HEREIN, THEN (A) DO NOT DOWNLOAD, INSTALL, OR USE THE SOFTWARE (OR, AS APPLICABLE THE JUNIPER EQUIPMENT IN WHICH THE SOFTWARE IS EMBEDDED), AND (B) WITHIN 30 DAYS AFTER RECEIPT OF THE SOFTWARE, EITHER RETURN THE SOFTWARE TO JUNIPER OR THE APPLICABLE RESELLER FOR FULL REFUND OF THE SOFTWARE LICENSE FEE, OR, IF THE SOFTWARE WAS EMBEDDED IN JUNIPER EQUIPMENT FOR WHICH SOFTWARE NO SEPARATE LICENSE FEE WAS CHARGED, RETURN THE EQUIPMENT AND EMBEDDED SOFTWARE, UNUSED, TO JUNIPER OR THE APPLICABLE RESELLER FOR A FULL REFUND OF THE PURCHASE PRICE.

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ПРОЧИТАЙТЕ ДАННОЕ ЛИЦЕНЗИОННОЕ СОГЛАШЕНИЕ КОНЕЧНОГО ПОЛЬЗОВАТЕЛЯ (“СОГЛАШЕНИЕ”) ДО ТОГО, КАК ЗАГРУЖАТЬ, УСТАНОВЛИВАТЬ ИЛИ ИСПОЛЬЗОВАТЬ ДАННОЕ ПРОГРАММНОЕ ОБЕСПЕЧЕНИЕ. JUNIPER ГОТОВ ПРЕДОСТАВИТЬ ВАМ ЛИЦЕНЗИОННОЕ ПРОГРАММНОЕ ОБЕСПЕЧЕНИЕ ПРИ УСЛОВИИ ПРИНЯТИЯ ВАМИ ВСЕХ УСЛОВИЙ ДАННОГО СОГЛАШЕНИЯ. РУССКИЙ ПЕРЕВОД ДАННОГО СОГЛАШЕНИЯ МОЖНО НАЙТИ ПО ССЫЛКЕ <http://www.juniper.net/techpubs/software/software-license.html>. ПУТЕМ ЗАГРУЗКИ, УСТАНОВКИ, ИСПОЛЬЗОВАНИЯ ДАННОГО ПРОГРАММНОГО ОБЕСПЕЧЕНИЯ ИЛИ КАКИМ-ЛИБО ИНЫМ ОБРАЗОМ, ВЫРАЖАЯ СВОЕ СОГЛАСИЕ С УСЛОВИЯМИ, СОДЕРЖАЩИМИСЯ В СОГЛАШЕНИИ, ВЫ ЛИЧНО ИЛИ ОТ ИМЕНИ КОМПАНИИ ЛИБО ОРГАНИЗАЦИИ, КОТОРУЮ ВЫ ПРЕДСТАВЛЯЕТЕ, СОГЛАШАЕТЕСЬ НА СОБЛЮДЕНИЕ УСЛОВИЙ ДАННОГО СОГЛАШЕНИЯ. ЕСЛИ ВЫ НЕ СОГЛАШАЕТЕСЬ ИЛИ НЕ МОЖЕТЕ СОГЛАСИТЬСЯ С СОДЕРЖАЩИМИСЯ В НЕМ УСЛОВИЯМИ, В ТАКОМ СЛУЧАЕ (А) НЕ ЗАГРУЖАЙТЕ, НЕ УСТАНОВЛИВАЙТЕ И НЕ ИСПОЛЬЗУЙТЕ ДАННОЕ ПРОГРАММНОЕ ОБЕСПЕЧЕНИЕ (ИЛИ, СООТВЕТСТВЕННО, ОБОРУДОВАНИЕ JUNIPER, В КОТОРОЕ ВСТРОЕНО ДАННОЕ ПРОГРАММНОЕ ОБЕСПЕЧЕНИЕ) И (В) В ТЕЧЕНИЕ 30 ДНЕЙ ПОСЛЕ ПОЛУЧЕНИЯ ПРОГРАММНОГО ОБЕСПЕЧЕНИЯ ЛИБО ВОЗВРАТИТЕ ПРОГРАММНОЕ ОБЕСПЕЧЕНИЕ КОМПАНИИ JUNIPER ИЛИ СООТВЕТСТВУЮЩЕМУ ДИЛЕРУ ПРИ УСЛОВИИ ПОЛНОГО ВОЗМЕЩЕНИЯ СТОИМОСТИ ЛИЦЕНЗИОННОГО СБОРА ЗА ПРОГРАММНОЕ ОБЕСПЕЧЕНИЕ ИЛИ, ЕСЛИ ПРОГРАММНОЕ ОБЕСПЕЧЕНИЕ ВСТРОЕНО В ОБОРУДОВАНИЕ JUNIPER, НА КОТОРОЕ НЕ ВЗИМАЕТСЯ ОТДЕЛЬНЫЙ ЛИЦЕНЗИОННЫЙ СБОР ЗА ПРОГРАММНОЕ ОБЕСПЕЧЕНИЕ, ВОЗВРАТИТЕ НЕИСПОЛЬЗОВАННОЕ ОБОРУДОВАНИЕ И ВСТРОЕННОЕ ПРОГРАММНОЕ ОБЕСПЕЧЕНИЕ КОМПАНИИ JUNIPER ИЛИ СООТВЕТСТВУЮЩЕМУ ДИЛЕРУ ПРИ УСЛОВИИ ПОЛНОГО ВОЗМЕЩЕНИЯ СТОИМОСТИ ПОКУПКИ.

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This Agreement, as may be modified by any applicable Country-Specific Terms, defined below, governs Customer's access to and use of the Software (as defined below) first placed in use by Customer on or after the release date of this Agreement; provided that if there is a valid, unexpired separate written agreement signed by Customer and Juniper Networks governing Customer's use of the Software, then to the extent of a conflict between their provisions the order of precedence shall be (i) that signed written agreement, and (ii) this End User License Agreement as may be modified by any Country-Specific Terms as they apply to use of Software in a particular country. In addition, any non-English translated version of this Agreement posted at <http://www.juniper.net/techpubs/software/software-license.html> shall be the governing version of this Agreement for purposes of use of the Software in the territory designated at such website as the territory for which such translation applies. **IF YOU ARE USING JUNIPER SOFTWARE OUTSIDE THE UNITED STATES, CHECK <http://www.juniper.net/techpubs/software/software-license.html> TO SEE IF ANY COUNTRY-SPECIFIC TERMS OR TRANSLATION APPLY.**

1. **Definitions.** In this Agreement and in the Entitlements (unless the Entitlement otherwise expressly provides), the following capitalized terms shall have the meaning set forth below:
- a. **“Authorized Users”** means the number of Users that Customer is licensed to have access to the Software.
  - b. **“Concurrent Users”** means the number of Users that Customer is licensed to have concurrently accessing the Software. If a single User connects to Software using multiple concurrent log-ins or connections, each such active logical connection or log-in is counted toward the number of Concurrent Users.
  - c. **“Country-Specific Terms”** means those terms posted at <http://www.juniper.net/techpubs/software/software-license.html> and designated as replacing one or more terms of this End User License Agreement solely for Customers to the extent they use the Software in a particular country or group of countries (herein **“Geography”**). Any Country-Specific Terms applicable to Customers using the Software in a stated Geography shall take precedence over any inconsistent terms of this Agreement with respect to Customer’s use of the Software in such Geography.
  - d. **“Customer”** or **“You”** means the individual or other legal entity or other business, governmental or not-for-profit organization that (A) is the original end user purchaser of a license to the Software from Juniper or a Juniper-authorized reseller, (B) accepts the terms of this Agreement, and (C) is identified as Customer or end user in the applicable Entitlement or in the authorized reseller’s invoice for such license to the Software. If Software is lawfully received from Juniper or from an authorized reseller but there is no Entitlement, then “Customer” means the party that first so received the software from Juniper or its authorized reseller and accepts the terms of this Agreement. (See Section 2.k, below, with respect to license limitations where there is no Entitlement.)
  - e. **“Device”** means any device such as a computer, handset, tablet, laptop, server, switch or router. A Device may also be a physical or virtual machine, hardware partition or blade.
  - f. **“Embedded Software”** means a copy of operating system software delivered embedded in or loaded onto Juniper hardware equipment when such equipment is sold by Juniper; PROVIDED, however, that no Separately Licensable Feature incorporated in such Embedded Software shall itself be deemed licensed along with the Embedded Software unless an Entitlement expressly so provides. If the Customer has an Entitlement to an Update of such Embedded Software, then such Update is itself deemed “Embedded Software” to the extent such Update would be deemed Embedded Software without regard to this sentence had it been delivered installed on the Juniper equipment.
  - g. **“End-point”** means any Device that terminates a network connection.
  - h. **“Entitlement”** means the set of documents issued by (or under authority granted by) Juniper that specify (i) the Software licensed (by Juniper product number), (ii) the license term, (iii) the Licensed Units, (iv) the authorized use, if any, (v) the Customer, and (vi) the license fee charged, if any, and, if none is charged, the fact that the license was granted to Customer free-of-charge.
    - i. By way of illustration, “Entitlements” may be composed of, among other things, any of the following or combinations of the following, as long as together they meet the criteria of the preceding sentence: written agreement signed by Customer and Juniper, a product description in the Juniper price list, a Juniper invoice, a Juniper-issued e-certificate, a Juniper-issued email transmitting authorization codes, as to Updates, a Juniper website-posted Services Description Document, or an End User Services Agreement.
    - ii. In the event of inconsistency with respect to any two Entitlement documents or between this Agreement and any Entitlement document, the one most restrictive of the rights of the Customer shall take precedence.
  - i. **“Juniper”** means (a) Juniper Networks (Ireland) and/or its authorized service representative(s) if Customer has acquired its license rights to the Software for use in Europe, the Middle East or Africa; (b) Juniper Networks (Hong Kong) Ltd. and/or its authorized service representative(s) if Customer has acquired its license rights to the Software for use in the Asia Pacific Rim; or (c) Juniper Networks (U.S.), Inc. and/or its authorized service representative(s) if Customer has acquired its license rights to the Software for use in North America, Central America or South America
  - j. **“Licensed Unit”** means a unit of measure by which Customer’s licensed use of Software is limited, as specified in the Entitlement. Examples of Licensed Units include, but are not limited to, seats, users, sessions, calls, connections, subscribers, clusters, nodes, devices, links, ports, events or transactions. Licensed Units may also be based on throughput (such as gigabytes per second), performance, configuration, bandwidth, interfaces, processing, or geographic scope. Some Licensed Units are defined in this Section 1 and those definitions shall apply to all Entitlements except as otherwise expressly provided in such Entitlements. Such defined Licensed Units include: Authorized Users, Concurrent Users, Device, End-point, Managed Device, Subscriber, and User.
  - k. **“Managed Device”** is a Device that (1) is recognized by the Software as authorized to be configured, administered, managed, provisioned, monitored or otherwise acted upon by the Software or (2) has been configured, administered, managed, provisioned, monitored or otherwise acted upon by the Software.
  - l. **“Network”** means a set of networked Devices or other network elements of the Customer that are under the common management and operational control of Customer, and in the case of an internet service provider are located within a single country unless Customer’s Entitlement otherwise expressly provides.
  - m. **“Separately Licensable Feature”** means any module, feature, function, service, application, operation, or capability furnished in combination within other Software (herein, collectively, “feature”), which feature is separately licensable from Juniper or its authorized resellers for additional fee, whether such feature is ‘locked’ or key-restricted or even of the feature can be activated or used without a Juniper-issued product activation key.
  - n. **“Software”** means an instance of a program, module, feature, function, service, application, operation, or capability of the Juniper or Juniper-supplied software either (i) identified in an Entitlement as licensed to Customer or (ii) made available to Customer by Juniper or a Juniper-authorized reseller for Evaluation Use. **“Software”** may also consist of an instance either of a Separately Licensable Feature distributed in combination with other Software and or of an Update of other Software.
  - o. **“Subscriber”** is a Device, individual, Customer billing record or other identity that is recognized by the Software as authorized (presently, in the past or in the future) to receive services, usage, access or content which were, are or could be provided, managed, distributed, provisioned, billed

or otherwise enabled by the Software.

- p. **"Subscription License"** means a license to Software with respect to which the Entitlement states a finite, fixed term of use for the Software and either identifies the license as a "subscription" or expressly includes the right to Updates throughout the fixed term of use without need to purchase a separate Support Contract.
  - q. **"Support Contract"** means a support services contract that includes rights to receive certain Updates of the Software, which contract is either (i) a Juniper-issued contract purchased by Customer either from Juniper or from a Juniper-authorized reseller, or (ii) a support services contract issued by a support services provider to Customer under authorization granted by Juniper.
  - r. **"Update"** means Software that is an update, upgrade, bug fix or other new releases of other Software. Updates are either **"Major Releases"** (meaning a revision of Software as determined by Juniper Networks to have significant additional functionality or improved performance) or **"Minor Releases"** (meaning a bug fix, maintenance release, service release or a revision of a software application as determined by Juniper Networks to be limited to minor additional functionality or corrections of errors). An Entitlement to Updates may for certain cases exclude Major Releases.
  - s. **"Usage Monitor"** means a network management appliance or application software furnished to Customer (or approved in writing) by Juniper for monitoring use of the Software.
  - t. **"User"** means Device, individual, Customer billing record or other identity usable to gain access to any Software functionality (whether or not such account is restricted to a particular Device). User may be an individual or another Device. In counting Users for purposes of measuring usage against the licensed number of "Authorized Users" or "Concurrent Users," if a User can access the Software through another User each such User shall be counted separately.
2. **License Grant.** Subject to payment of the applicable fees and subject to the terms of this Agreement, Juniper grants to Customer a non-exclusive and non-transferable license, without right to sublicense, to use the Software, in executable form only, and only within the restrictions and subject to the conditions set forth in the Entitlement and those set forth in this Agreement. Unless otherwise expressly provided in the Entitlement:
- a. **Embedded Software.** Customer shall use Embedded Software solely for execution on the unit of Juniper equipment originally delivered to Customer with such Software installed. Any Update of such Embedded Software that Customer has licensed under a Support Contract may be loaded and executed only on the Juniper equipment on which the originally licensed Embedded Software is authorized to execute. Further, if Customer also licenses any Separately Licensable Feature combined with or incorporated in the Embedded Software (whether in dormant or active form), Customer may use such Separately Licensable Feature only for execution on the Juniper equipment on which the Embedded Software is authorized to execute. The license term for any such Separately Licensable Feature or Update shall be as specified in its own Entitlement. Notwithstanding any other provision of this Agreement, except as may otherwise be required by applicable law, no license is granted for installation or use of any Embedded Software or associated Update or Separately Licensable Feature on any Juniper equipment resold by anyone who is not an authorized reseller of such equipment.
  - b. **Single Instance/Single Device.** Except to the extent otherwise explicitly stated in the Entitlement (including, without limitation, where the Entitlement states that the license is a "Network License") Customer shall use a single instance of the Software on a single Device and the quantity of all applicable Licensed Units shall be one (1).
  - c. **Non-transferability of Licensed Units.** Unless expressly permitted by the Entitlement, quantities of Licensed Units purchased separately are not allowed to be transferred or allocated between or among different licenses or instances of the Software.
  - d. **Separately Licensable Features and Updates.** Unless otherwise expressly stated in an Entitlement purchased by Customer, a license to a particular release of Software shall not entitle Customer to receive or use any Separately Licensable Feature delivered in combination with that Software or any Update of that Software. An Entitlement to a Separately Licensable Feature or to an Update may specify terms, conditions and restrictions, including different Licensed Units and different term of use, that are different than those of that underlying licensed Software; provided however, that in no event shall any such Entitlement be construed to expand implicitly any terms, conditions or restriction of use of the underlying licensed Software.
  - e. **Network License.** If the Entitlement specifies that it is a Network License, Customer may allocate the applicable Licensed Units across the licensed number of Software instances provided that (i) such instances are all running on the Customer Network specified in Customer's Entitlement; (ii) the total number of Licensed Units does not exceed the number licensed under that Entitlement and (iii) a Usage Monitor is used to validate (i) and (ii) and to report such usage to Juniper. Customer shall not alter or disable the Usage Monitor at any time during the term of the network license and shall not disable, alter or destroy the Usage Monitor, its connection to Juniper or any data collected by such Usage Monitor. If the network license is granted as to a particular number of Licensed Units, then all licensed copies of the software in the Customer Network may not be used to support in the aggregate more than that number of Licensed Units.
  - f. **Updates.** Except as expressly provided below in Section 2.g, below, with respect to Subscription Licenses or as otherwise expressly provided in an Entitlement or Support Contract, Customer shall have no rights in any Update to Software, nor any rights to support services associated with such Software.
  - g. **Subscription License.** In case of a Subscription License of Software, Juniper Networks shall make available to Customer during the term of the Subscription License the Supported Updates (as defined below) solely for support of the Customer's licensed copy(ies) of such Software during the term of the Subscription License, subject to the terms and conditions set forth below:
    - i. As used herein, **"Supported Updates"** as of any particular time during the term of the Subscription License means any Update of such Software then available generally to Customers who have purchased a Subscription License to such Software.
    - ii. **Rights in Supported Updates.** For each Supported Update, the Customer's rights in such Update will be subject to the same terms, restrictions and conditions as apply to the Software (including without limitation the terms, restrictions or conditions on use set forth in this Agreement and in any "Entitlement" as it applies to the Software).
  - h. Specific license terms applicable to particular products:



- i. Junos Space Software. If this license is granted in fulfillment of a Customer purchase order (or associated fulfillment documentation) placed with Juniper or any Juniper-authorized reseller or support services provider (including any Operate Specialist) for any package of Junos Space Software, then Customer is authorized to use Junos Space in a networked environment on the Customer Network identified in the Entitlement solely to manage Devices in such Customer Network, but only to the extent of Licensed Units specified in the Entitlement. If, instead, Customer's license in a package of Junos Space Software is granted in fulfillment of a feature of a Support Contract, the scope of the license shall be as set forth in that Support Contract, an associated Service Description Document or another associated Entitlement.
  - ii. Steel-Belted Radius or Odyssey Access Client Software -- Customer shall use such Software on a single computer containing a single physical random access memory space and containing any number of processors. Use of the Steel-Belted Radius or IMS AAA Software on multiple computers or virtual machines (e.g., Solaris zones) requires multiple licenses, regardless of whether such computers or virtualizations are physically contained on a single chassis.
    1. The Global Enterprise Edition of the Steel-Belted Radius Software may be used by Customer only to manage access to Customer's enterprise network. Specifically, service provider Customers are expressly prohibited from using the Global Enterprise Edition of the Steel-Belted Radius Software to support any commercial network access services.
  - i. If the Entitlement specifies "*Research and Development Use*", then Customer may only use the Software in Customer's own internal lab activities for research and development, excluding (A) research and development activities conducted as a paid contractor on behalf of a third party, and (B) any use of Software supporting, or installed or incorporated in whole or in part in, a product or service made commercially available or supporting live network traffic in the ordinary course of Customer's business.
  - j. If the Entitlement specifies "*Lab Use*", then Customer may only use the Software in Customer's own internal lab activities to evaluate and test network setup and configuration and feature testing, but excluding (A) lab testing or other activities conducted as a paid contractor on behalf of a third party, and (B) any use of Software supporting, or installed or incorporated in whole or in part in, a product or service made commercially available or supporting live network traffic in the ordinary course of Customer's business.
  - k. If there is no Entitlement, or if there is an Entitlement that specifies "*Evaluation*", "*Demonstration*" or "*Trial*" use then Customer may only use the Software for its internal evaluation or qualification of the Software (or the equipment in which it is embedded) and only in a development or test network environment in contemplation of potential future licensing for a commercial or other use.
  - l. Except to the extent otherwise required by applicable law or expressly provided in the Entitlement, this license is not sublicensable, transferable or assignable by Customer and any attempted sublicense, transfer or assignment shall be null and void.
3. **Use Prohibitions.** Notwithstanding the foregoing, this license does not permit the Customer to, and Customer agrees that it shall not, alone or through another party: (a) modify, unbundle, reverse engineer, or create derivative works based on the Software; (b) make copies of the Software (except as necessary for backup purposes and as otherwise expressly permitted in the Entitlement); (c) remove any proprietary notices, labels, or marks on or in the Software; (d) distribute any copy of the Software to any third party, including Embedded Software in Juniper equipment sold in any secondhand market; (e) use any feature, function, service, application, operation, or capability embedded within Software (herein, collectively, "feature") where such feature is 'locked,' key-restricted or otherwise identified as not licensed for use without paying a separate fee, unless Customer first purchases the applicable license(s) and obtains a valid authorization from Juniper supported by an Entitlement explicitly authorizing such feature; this prohibition applies even if the feature can be activated or used without a Juniper-issued product activation key; (f) distribute any product activation key for the Software provided by Juniper to any third party; (g) use the Software in any manner that extends or is broader than the uses purchased by Customer from Juniper or an authorized Juniper reseller; (h) use Embedded Software on non-Juniper equipment; (i) use Embedded Software (or make it available for use) on Juniper equipment that the Customer did not originally purchase from Juniper or an authorized Juniper reseller; (j) disclose the results of testing or benchmarking of the Software to any third party without the prior written consent of Juniper; (k) attempt to alter or deface any notice or marking on any copy of the Software or attempt to assign or transfer any rights (whether by contract, by operation of law or otherwise) under this Agreement or under any Entitlement; (l) use any Update to which Customer may otherwise be entitled if either (1) at the time of acquiring such Update, Customer does not already hold a valid license to the original Software or (2) Customer has not paid the applicable fee for the Update (or the Support Contract under which the Update is furnished); (m) deactivate or modify or impair the functioning of any Usage Monitor or any record, log or functionality designed to monitor, measure or limit use of the Software or compliance with the license terms of this Agreement; (n) unless otherwise expressly provided in the Entitlement, permit any other User to use its access to any Software features or functionality in support of any business activity in which such other User for a fee grants third parties access to such features or functionality; or (o) use the Software or permit any User or any other third party to use the Software in violation of any applicable law or regulation or to support any illegal activity.
4. **Audit.** Customer agrees to allow Juniper or its independent professionals the right, at any times during the term of any license to any Software licensed by Juniper to Customer hereunder and thereafter until three years after the latest termination or expiration date of any such license, to inspect and copy during normal business hours the Usage Monitor logs, other Software logs and other relevant Customer records to verify Customer's compliance with this Agreement and the Entitlement; provided that any such inspection and copying shall be conducted under reasonable and customary restrictions to protect against use or disclosure of confidential Customer information therein other than as appropriate to verify Customer's compliance with the terms of this Agreement and any Entitlement and to enforce Juniper's rights thereunder. In the event such inspection discloses non-compliance with this Agreement, Customer shall promptly pay to Juniper the appropriate license fees, plus the reasonable cost of conducting the audit.
5. **Recordkeeping.** Customer shall maintain accurate records as necessary to verify compliance with this Agreement. Upon request by Juniper, Customer shall furnish such records to Juniper and certify its compliance with this Agreement.
6. **Confidentiality.** The Parties agree that aspects of the Software and associated documentation are the confidential property of Juniper. As such, Customer shall maintain the Software and associated documentation in confidence, which at a minimum includes restricting access to the Software to Customer employees and contractors having a need to use the Software for Customer's internal business purposes.
7. **Ownership.** Juniper and Juniper's licensors, respectively, retain ownership of all right, title, and interest (including copyright) in and to the Software, associated documentation, and all copies of the Software. Nothing in this Agreement constitutes a sale or other transfer or conveyance of any right, title, or interest in the Software or associated documentation.

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- a. In addition, with respect to Embedded Software embedded in Juniper security products, application acceleration products or certain other Hardware products, as more specifically set forth on <http://www.juniper.net/support>, for a period of fifteen (15) days from the date a Customer receives such Hardware product Juniper will provide the Customer that purchased such Hardware product access to one (1) download of the most recent commercially-available revision of Software that is embedded in such hardware product. Customer may download the Software by going to <http://www.juniper.net/support>. Such download shall be treated as though it were an Update for purposes of this Agreement. This right to download extends only to the Customer and not to any subsequent transferee of the Hardware product on which it is embedded;
  - b. In any event, **THE SOLE AND EXCLUSIVE REMEDY OF THE CUSTOMER AND THE ENTIRE LIABILITY OF JUNIPER UNDER THIS LIMITED WARRANTY SHALL BE THE REPLACEMENT OF THE MEDIA CONTAINING THE SOFTWARE.**
  - c. **Restrictions:** No warranty will apply if the Software (i) has been altered, except by Juniper Networks; (ii) has not been installed, operated, repaired, or maintained in accordance with instructions supplied by Juniper; (iii) has been subjected to unreasonable physical, thermal or electrical stress, misuse, negligence, or accident or (iv) has been licensed solely for Evaluation Use or demonstration use or is beta software or otherwise not commercially released. In addition, Software is not designed or intended for use in (i) the design, construction, operation or maintenance of any nuclear facility, (ii) navigating or operating aircraft; or (iii) operating life-support or life-critical medical equipment, and Juniper disclaims any express or implied warranty of fitness for such uses. Customer is solely responsible for backing up its programs and data to protect against loss or corruption. Juniper warranty obligations do not include installation, reinstallation or backup support.
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# ABOUT THIS GUIDE

## Junosphere Documentation and Release Notes

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For a list of related Junosphere documentation, see <http://www.juniper.net/techpubs/>.

If the information in the latest release notes differs from the information in the documentation, follow the *Junosphere Release Notes*. To obtain the most current version of all Juniper Networks technical documentation, see the product documentation page on the Juniper Networks website at <http://www.juniper.net/techpubs/>.

Juniper Networks supports a technical book program to publish books by Juniper Networks engineers and subject matter experts with book publishers around the world.

These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration using the Junos OS and Juniper Networks devices. In addition, the Juniper Networks Technical Library, published in conjunction with O'Reilly Media, explores improving network security, reliability, and availability using Junos OS configuration techniques. All the books are for sale at technical bookstores and book outlets around the world. The current list can be viewed at <http://www.juniper.net/books>.

## Objectives

---

This guide provides an overview of the Junosphere features supported in this release and describes how to configure the features to provide solutions to setting up a virtual network.



**NOTE:** For additional information about the Junos OS—either corrections to or information that might have been omitted from this guide—see the software release notes at [http://www.juniper.net/techpubs/en\\_US/release-independent/junosphere/information-products/pathway-pages/junosphere/product/index.html](http://www.juniper.net/techpubs/en_US/release-independent/junosphere/information-products/pathway-pages/junosphere/product/index.html).

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## Audience

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This guide is designed for network administrators who are configuring and monitoring the Junosphere virtual network.

To use this guide, you need a broad understanding of networks in general, networking principles, network configuration and Junos OS configuration.

Personnel operating the equipment must be trained and competent and must abide by the instructions provided by the documentation.

## Using the Indexes

This reference contains a standard index with topic entries.

# Documentation Conventions

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Table 1 on page xxii defines the notice icon used in this guide.

Table 1: Notice Icon


ICON	MEANING	DESCRIPTION
	Informational note	Indicates important features or instructions.

Table 2: Text and Syntax Conventions defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

CONVENTION	DESCRIPTION
<b>Bold text like this</b>	Represents text that you type.
Fixed-width text like this	Represents output that appears on a terminal screen.
<i>Italic text like this</i>	<ul style="list-style-type: none"><li>• Introduces important new terms.</li><li>• Identifies book names.</li><li>• Identifies RFC and Internet drafts.</li></ul>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands of configuration statements.
Text like this	Represents names of configuration statements, commands, files, and directory interface names; configuration hierarchy levels; or labels on routing platform components.
< > (angle brackets)	Enclose optional keywords or variables.
(pipe symbol)	Indicates a choice between keywords or variables on either side of the symbol. The set of choices are enclosed in parentheses for clarity.

# (pound sign)	Indicates a comment specified on the line as the configuration statement to which it applies.
[ ] (square brackets)	Enclose a variable for which you substitute one or more values.
{ } (indents and braces)	Identify a level in the configuration hierarchy.
; (semicolon)	Identifies a leaf statement at a configuration hierarchy level.

## Documentation Feedback

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We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to [techpubs-comments@juniper.net](mailto:techpubs-comments@juniper.net), or fill out the documentation feedback form at <https://www.juniper.net/cgi-bin/docbugreport/>. If you are using e-mail, be sure to include the following information with your comments:

- Document or topic name
- URL or page number
- Software release version (if applicable)

## Requesting Technical Support

---

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the JTAC User Guide located at <http://www.juniper.net/us/en/local/pdf/resourceguides/7100059-en.pdf>.
- JTAC Hours of Operation —The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

## Self-Help Online Tools and Resources

---

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://www.juniper.net/alerts/>
- Join and participate in the Juniper Networks Community Forum: <http://www.juniper.net/company/communities/>

- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://tools.juniper.net/SerialNumberEntitlementSearch/>.

## Opening a Case with JTAC

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You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <http://www.juniper.net/cm/>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, visit us at <http://www.juniper.net/support/requesting-support.html>.



# USING JUNOSPHERE

## Junosphere Overview

---

Junosphere is a virtualization environment where multiple virtual machines representing network devices can be connected and configured to create network topologies.

For the initial release, you provide information about your network, and the Juniper Sales Engineer (SE) will set up the cloud, or virtual network, for you. You can then access the topology and configure and use the network devices.

## Using the Interface

---

Users will receive an e-mail with the URL to the login page of the user interface, as well as a user name and password.

1. Log in to the user interface.

The first time you log in, you will be presented with the End User License Agreement (EULA).

2. Agree to the terms of the agreement to proceed.

The Announcements page appears. The page displays a scroll-down box with system and operational messages you should review.

3. Click Library

The Library page appears. The Library page lists your topologies and shows their usage and state of activity. One topology should be labeled Active. The Sales Engineer activated that topology as part of setting up the virtual network.

4. Click the **Start** button if the topology is active, but not yet started.

5. Click the **Topology** button.

The Topology page appears. The page lists each virtual machine for the active topology.

6. Connect to the active topology representing a virtual network by:

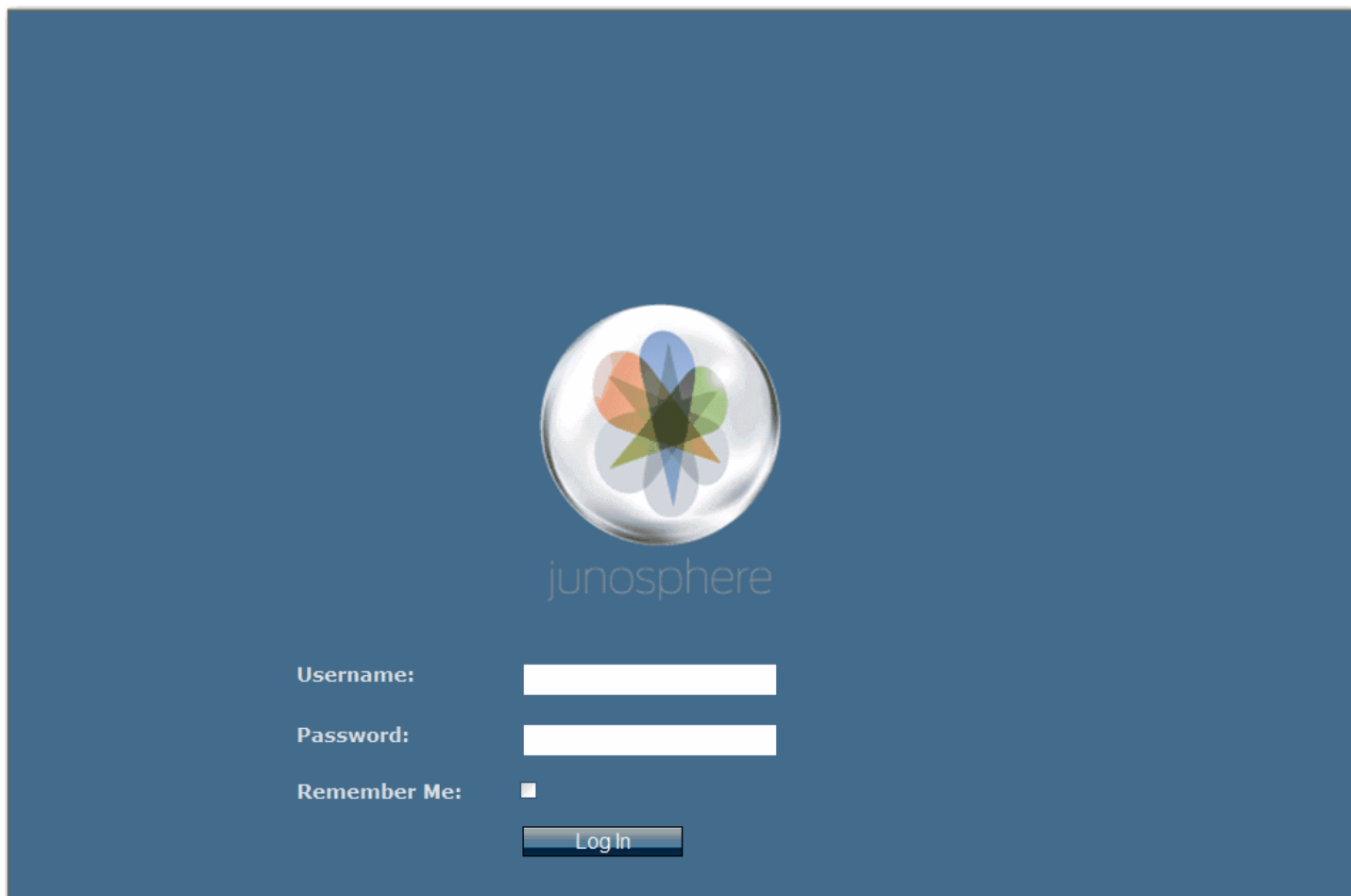
- Using the Access Portal and Network Connect pages to establish an SSL VPN connection to the virtual network.
- Using a program such as telnet, SSH, or vnc, to connect to the virtual machines.

Details on using these pages and procedures are listed in the following sections.

## The User Interface Login Page

Use the Login page to sign in to the Junosphere user interface. Enter the username and password mailed to you by the Junosphere administrator. Figure 1 on page 2 shows the Login page.

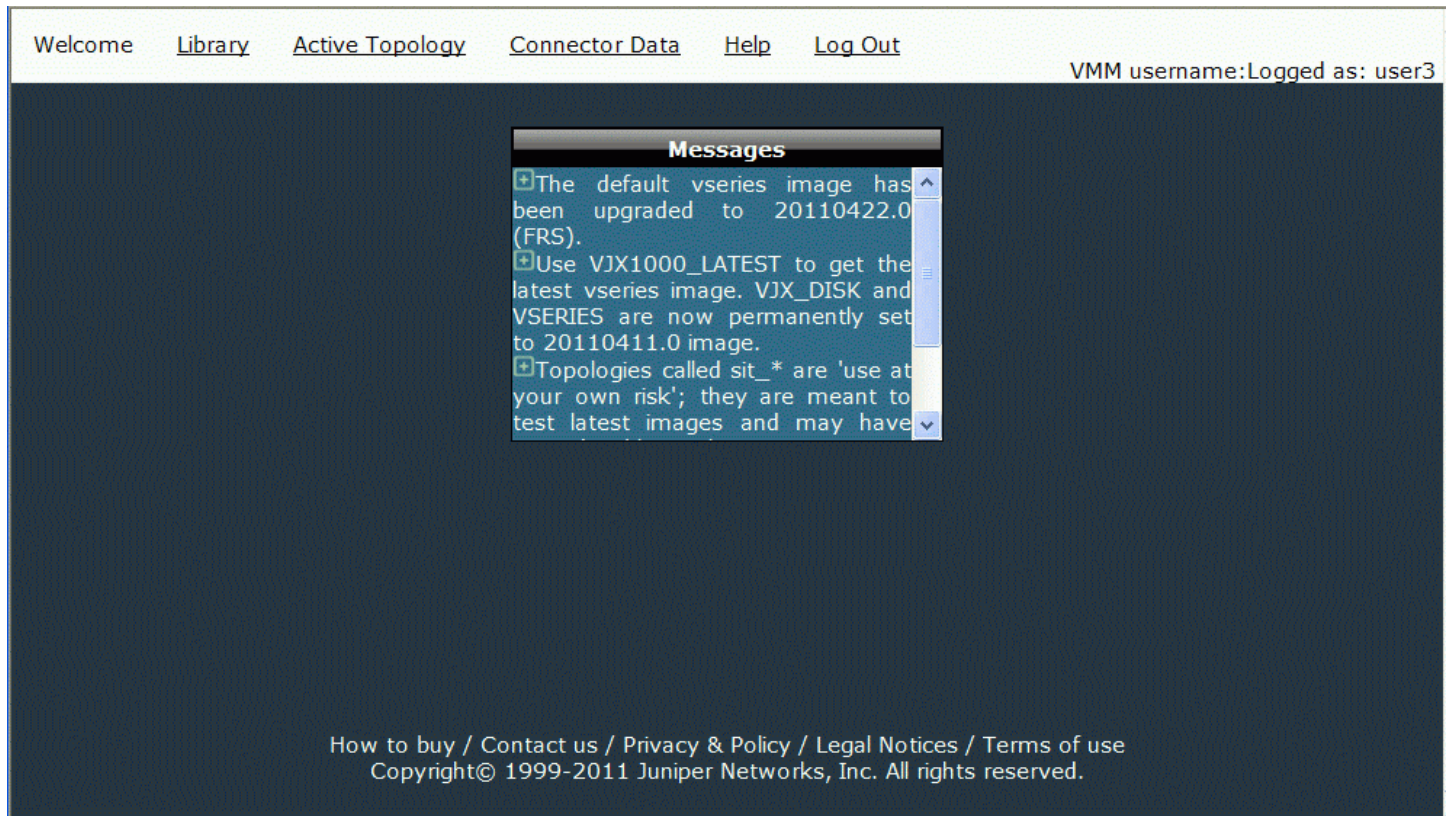
Figure 1: Logging In to the User Interface

The image shows the Junosphere login page. It has a dark blue background. In the center, there is a circular logo with a stylized flower or star shape inside, composed of several overlapping colored triangles (blue, green, orange, and grey). Below the logo, the word "junosphere" is written in a light grey, lowercase, sans-serif font. Further down, there are three labels: "Username:", "Password:", and "Remember Me:". Each label is followed by a white input field. The "Remember Me:" label is followed by a small square checkbox. Below these fields is a "Log In" button with a blue gradient and white text.

## Using the Announcements Page

The page displays a scroll-down box with system and operational messages you should review.

Figure 2 The Announcements Page



## Using the Library Page

The Library page lists your topologies and shows their status. In order for you to use a topology, it should be active and started.

Initially, the page should show a library of topologies. (The topologies may have been loaded for you by the Sales Engineer.) Select the appropriate topology by clicking **Activate** and then clicking **Start**. Starting a topology is a request to boot a number of virtual machines. This may take some time depending on the number of virtual machines in the topology.

### Starting and Stopping a Topology

To start a topology:

1. Click **Activate**.
2. Click **Start**.

To stop a topology:

1. Click **Save** or **Save As** if you want to save changes and have the privileges to save.
2. Click **Stop**.
3. Click **Deactivate**.

Until a topology is activated, you will only see certain buttons. Once you activate a topology, all the buttons will appear. Click the appropriate button to perform the following functions:

- **Network Connect** — Connects to the (Secure Access) Access Portal login page.

- Deactivate — Tars and zips the topology files and removes them from the active directory.
  - Start — Launches the active topology with its configuration file set. The file set consists of:
    - A .vmm topology configuration file
    - A Junos OS CLI .conf configuration file for each Junos virtual device (optional)
  - Cancel — Stops a starting topology.
  - Stop — Stops the active topology.
  - Save — Saves the active topology to the library.
  - Save As — Saves the active topology to another library or renames the file.
  - Upload Topology — Uploads a topology from a local network.
  - Joined Started Topology – For use in educational settings, allows students to connect to the topology of an instructor. Allows students to access the Active Topology and Connector Data screens of the instructor.
  - Leave Topology – Allows a user to leave another's topology.
- The Topology Listings dialog box has the following functions:
- Topology — Lists all topologies.
  - Library — The library that contains each topology file set.
  - Description – Describes the topology.
  - Activate — Extracts the topology from the database and places it in the active directory.
  - Download Topology— Downloads the topology to a local network.
  - Pencil icon — Use to view the topology file set, including the topology.vmm file and configuration files for the network devices.
  - Delete — Removes a topology.

Figure 3 on page 5 shows the Library page.



Figure 3: User Library Page

File Edit View Favorites Tools Help

★ Favorites Library

Message Center Library Active Topology Connector Data Help Log Out VMM username:Logged as: user3

**Messages**

Topology is starting...  
Progress 1/8: validate operation.  
Progress 2/8: validate access portal.  
Progress 3/8: validate SA/VLAN.

STARTING: vjx\_3\_vms

Deactivate Start Cancel Stop Save Save As Upload Topology Join Started  
Leave Topology

Topology	Library	Description	Activate	Download Topology	Edit	Delete
vjx_10_vms	Public	10 vm with 16 ifl each	Activate	Download Topology		
topo100	Public	test-topo 100	Activate	Download Topology		
vjx_4_vms	Public	Ashwin_test_file	Activate	Download Topology		
vjx_15_vms	Public	ashwin_test_file_2	Activate	Download Topology		
vm8_mar21	Public	8 VMs	Activate	Download Topology		
vjx_3_vms	Public	test topology of user user1	Activate	Download Topology		
2vms	Public	2vms_new	Activate	Download Topology		
new-larger-topo	Public	large-test-topo	Activate	Download Topology		
new-larger-modified	Public	modified-klarge-topo	Activate	Download Topology		

## Permissions

Permissions to use topologies are assigned to users based on public or private libraries. Table 3 and Table 4 list the permissions by library.

Table 3: Public Library Permissions

Function	User
Start/stop	*
Save	
Save As	
Delete	
Edit	
Upload to Public Library	

Table 4: Private Library Permissions

Function	Users	Comments
Start/stop	*	Only one user per company/group is assigned this permission
Save	*	
Save As to a private library	*	
Delete	*	
Edit	*	
Upload	*	Users may receive permission to upload topologies to a private library

- In addition to these permissions, the following applies:
- Join Started Topology - Users (students, for example) who do not have start/stop permissions may be assigned the ability to join/leave an active topology.
  - For any library you can see, you can use the Download Topology button to download a topology to your workstation.

## Saving Device Configurations

Just as with a physical Junos OS device, Junos OS CLI configuration changes are made in edit mode and then committed to implement the changes on the router. They will persist and be used by the router as long as the router virtual machines in the topology remain “Started.” To save configuration changes for re-use when restarting a topology in the future, files must be saved in the configuration file set stored as part of the topology definition in the user’s library.

To save configuration file changes in the library, click **Save** on the Library page to save the revised file set to the library. The next time the topology is started, the configuration file set will be applied, as specified by the install command in the .vmm topology definition file.

For example, the .vmm topology file can have the following section:

```
vm "vrouters002" {  
  hostname "vrouters002" ;  
  VJX1000 LATEST  
  //description - interface to the outside world  
  interface "em0" { EXTERNAL;};  
  // description - link between vrouters002 and vrouters001  
  interface "em1" { bridge "private0"; };  
  // description - link between vrouters002 and vrouters003  
  interface "em2" { bridge "private1"; };  
  // description - configuration file to load on the router  
  install "ENV(HOME)/active/configset/vrouters002.conf" "/root/junos.conf";  
};
```

The name of the configuration file that the router will save when you make any changes is: vrouters002.conf.

If you make the name of the configuration file the same as the name that the router will save (vrouters002.conf, for example), then if you start, make configuration changes, save, stop, and restart your topology; the router will restart with the latest or saved configuration changes. If you make the name of the configuration file something different, then if you start, make configuration changes, save, stop, and restart the topology; the router will restart with the *original* configuration and not the *saved* configuration.

You can also click **Save As** to save the configuration set to a different library (or to rename it in the same library), or click **Download** to save the configuration file set to a local directory.



**NOTE:** After using Save As, you are still working on the same (original) active topology. To work on a topology with a new name, you must Stop and Deactivate the current topology and Activate and Start the newly created topology.

## The File Set Details Page

From the Library page, click the pencil icon to display the File Set Details page for a topology.

You can update the file set name, library, and description.

The topology file set consists of:

- A .vmm topology configuration file
- A Junos OS CLI .conf configuration file for each Junos OS virtual device

Click **Download** to download a file locally for editing or backup.

Figure 4 on page 8 shows the File Set Detail page.



Figure 4: The File Set Detail Page

The screenshot displays a web interface for managing file sets. At the top, there is a 'Messages' section. Below it is the 'Edit Fileset' form, which includes fields for 'Name' (set to 'sit\_2\_idp\_pppoe\_plus'), 'Library' (set to 'Public'), and 'Description' (set to 'SIT Topol pppoe IDP plus'). A large text area for 'Long Description' is also present. An 'Edit' button is located at the bottom right of the form. Below the form is a table listing files with their names and download buttons.

File Name	
./topology.vmm	<a href="#">Download</a>
./configset/vjx1.conf	<a href="#">Download</a>
./configset/vjx0.conf	<a href="#">Download</a>

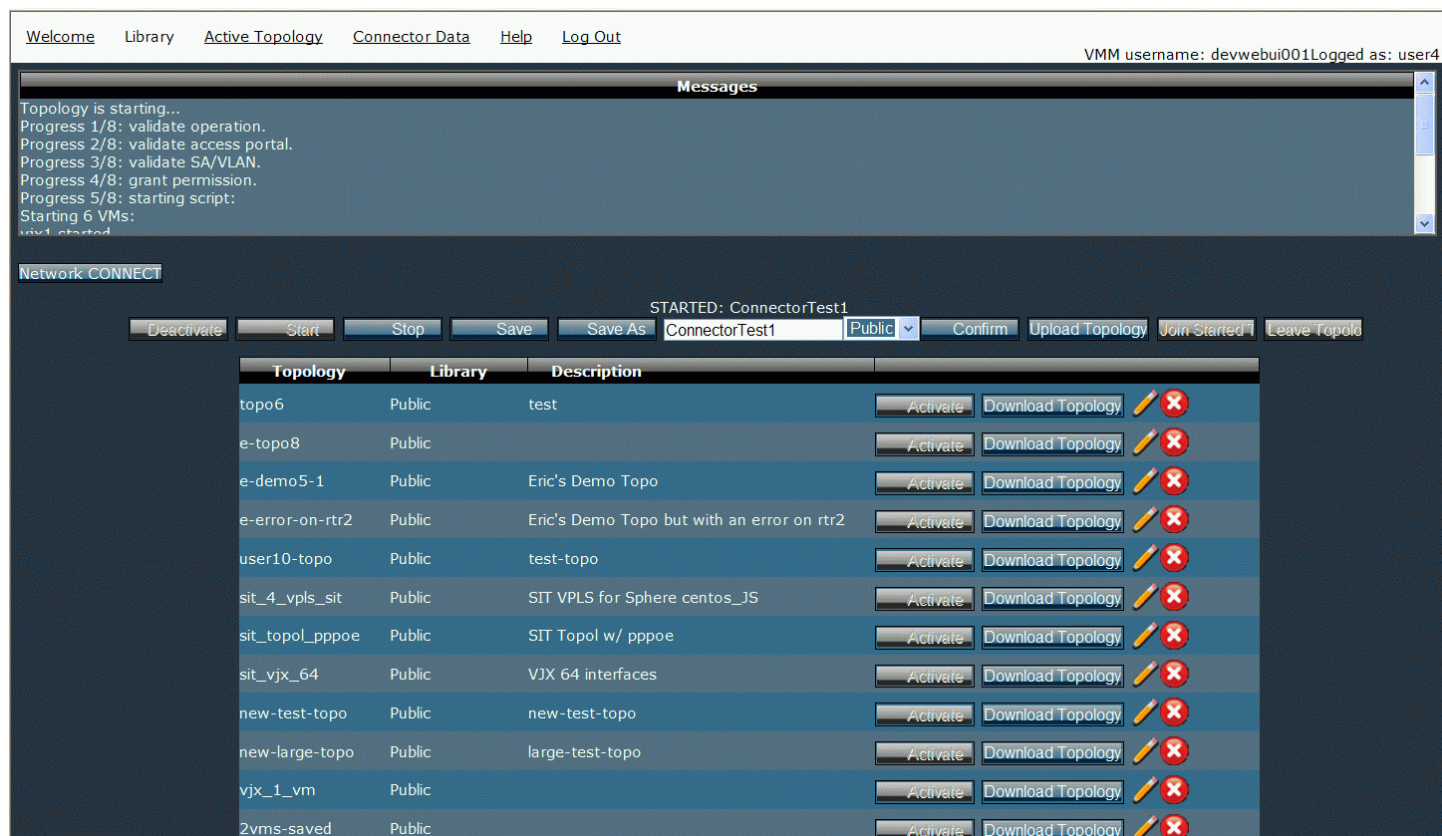
## Library Save As Button

Click the Topology **Save As** button to save a copy of the topology to a different library or with a different name.

Figure 5 on page 9 shows the Save As button.



Figure 5 : Save As Button



## Topology Upload Page

Use the Topology Upload page to upload a topology from a local directory:

1. Select the library you want to use in the upload.
2. Enter a description for the topology.
3. Select the file to upload.

Figure 6 on page 10 shows the Upload page for uploading topologies from a local directory.

**NOTE:** A topology file set must be less than 10 MB while each file must be less than 1 MB.

Figure 6: Upload Page

The screenshot shows a web application interface for uploading a topology fileset. At the top, a navigation bar includes links for 'Message Center', 'Library', 'Active Topology', 'Connector Data', 'Help', and 'Log Out'. The user is logged in as 'user3' with the username 'webui005'. A 'Messages' panel is visible on the left. The main content area is titled 'Upload new Topology Fileset' and contains the following fields and controls:

- Library:** A dropdown menu currently set to 'Public'.
- Description:** A single-line text input field.
- Details:** A multi-line text area with scrollbars.
- Upload:** A text input field followed by a 'Browse...' button.
- Buttons:** 'Upload' and 'Cancel' buttons at the bottom of the form.

At the bottom of the page, there is a footer with links: 'How to buy / Contact us / Privacy & Policy / Legal Notices / Terms of use' and a copyright notice: 'Copyright© 1999-2011 Juniper Networks, Inc. All rights reserved.'

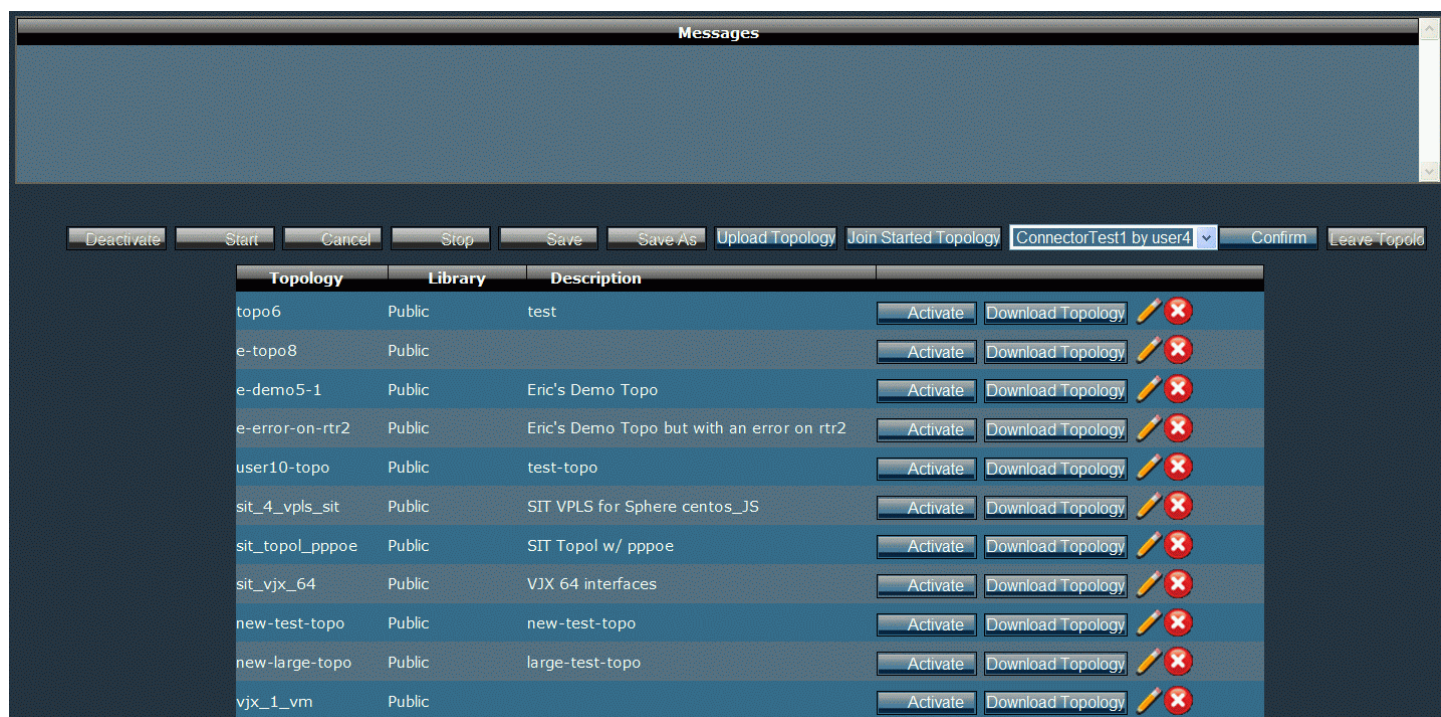
## Joining a Started Topology

The Join a Started Topology function allows a user to share a topology with other users in a specified group. The users in the group can connect to the shared topology and use the Active Topology and Connector Data screens of the sharing user, as well as the virtual machines of the topology.

This function is especially useful in an educational setting, when an instructor wants to share a topology with a group of students. The sharing permissions are set up upon request by the Junosphere administrator.



Figure 7 Joining a Started Topology Page



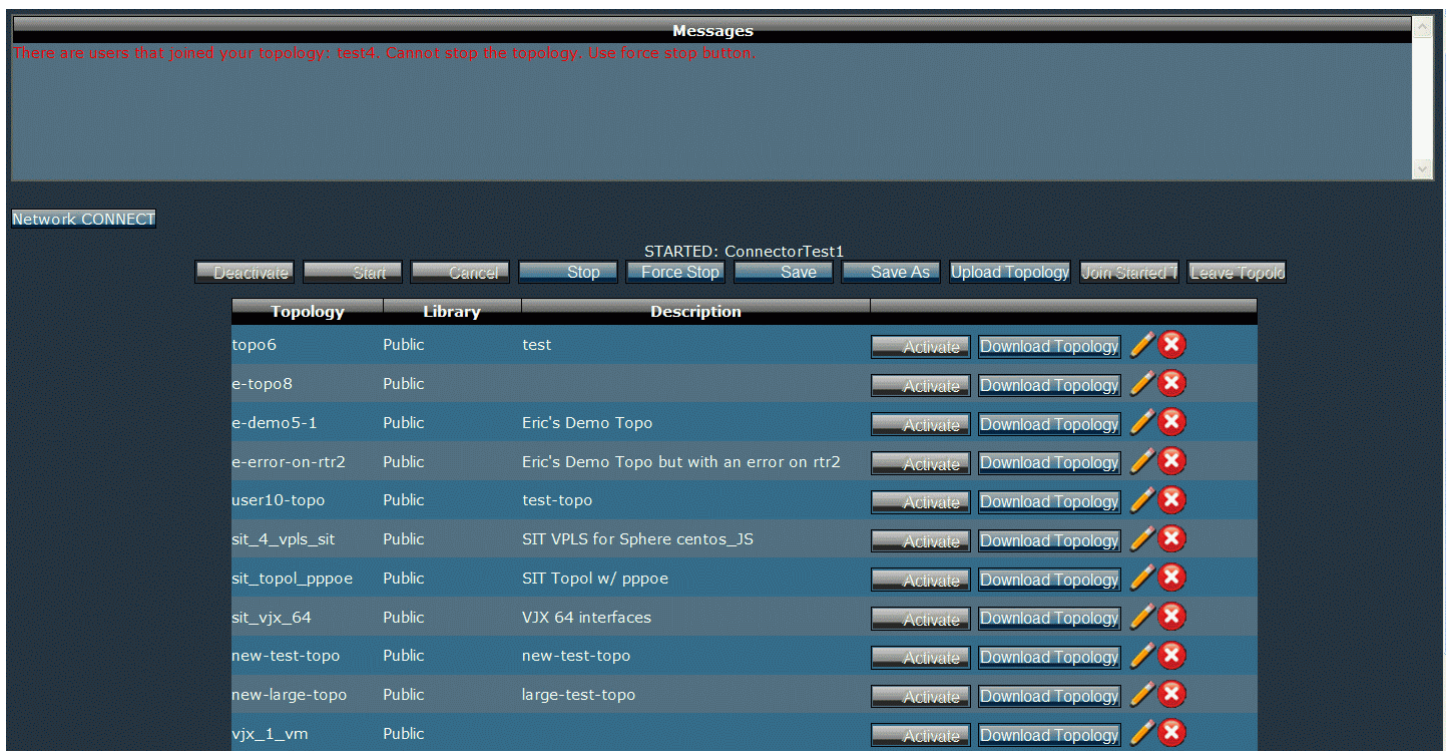
When you click on the **Join Started Topology** button, you are presented with a list of available shared topologies and their owners. Pick one of the topologies from the list and click **Confirm**. The interface displays that you have joined the topology.

When the interface connects to the started topology, it also displays the **Network Connect** button. Use the **Network Connect** button to connect to the shared cloud. You can then use a program such as telnet, SSH, or vnc to connect to the virtual machines in the cloud.

If the sharing user granted Allow Shared Control permissions, then the **Power on Reset** and **Rebuild** buttons on the Active Topology page should be visible and working. If the sharing user did not allow shared control, the buttons are grayed out.

If the sharing user should stop a topology with active joined users, a message displays warning that users are still joined to this topology. It warns that you have to use the **Forced Stop** button. Users will also receive a message indicating that the sharing user stopped the joined topology.

Figure 8 Stopping a Started Topology Page



## Library Download Button

Click the **Download** button to save a topology to a local directory.

Figure 9 on page 12 shows the download dialog box for downloading topologies to a local directory.

Figure 9: Download Dialog Box



## Using the Topology Page

---

Use the Topology page to review the active topology. The page lists each virtual machine for the active topology. You can view the information to connect to the console port or management Ethernet of each virtual machine.

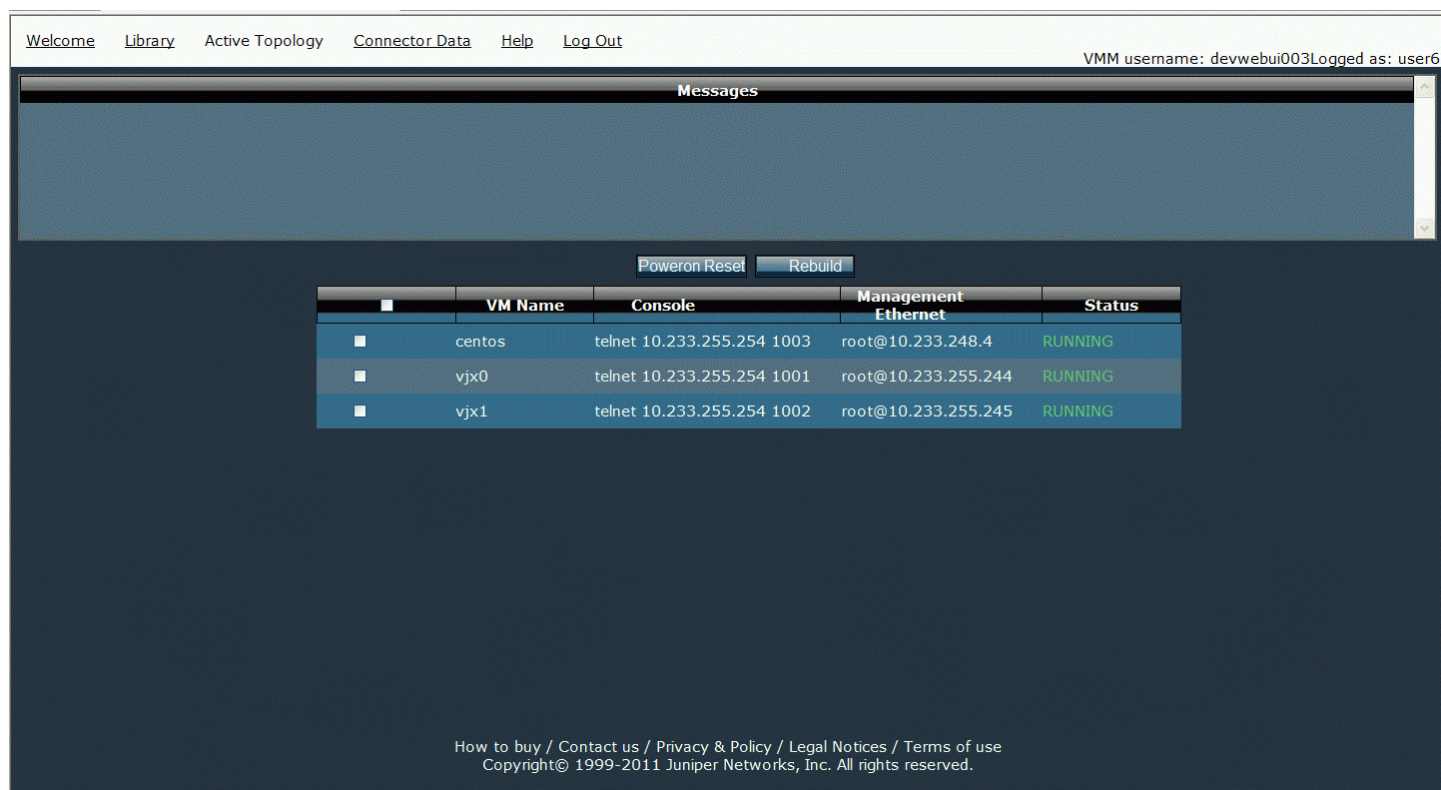
The following are the functions available from the Topology page:

- Messages — Lists systems news from the Junosphere administrator.
- Poweron Reset — This is the functional equivalent of turning the power off or on for the device. The device will restart as if the system was rebooted but the contents of the virtual machine's virtual disk are retained.
- Rebuild — Restores the original disk image. Resets the selected virtual machine to the state it was in when it was first started. Rebuild will eliminate any changes to the contents of the virtual machine's virtual disk and restart the virtual machine with the original disk. The rebuild only pertains to the restoration of the original disk image. If you configured a Junos OS configuration (for a Junos OS virtual machine), saved that configuration, and your topology.vmm file refers to that configuration, the network device will boot with that preserved configuration.
- VM Name — The names of the virtual machines in the active topology.
- Console — The telnet command to use to reach the console port of each virtual machine.
- Management Ethernet — The IP address of the Management Ethernet port and initial username to use when connecting via SSH.
- OS — Lists the OS of the virtual machine.
- Status — Indicates whether the virtual machine is running.

Figure 10 on page 14 shows the Topology page.



Figure 10: Topology Page



## Connecting to the Network Topology

You can connect to the virtual machines in the network topology to:

- View the status of each virtual machine.
- See details on what images are running.
- Start and stop virtual machines.
- Change virtual machine configurations.

To connect to the virtual network:

1. Establish an SSL VPN connection to the virtual network.
2. Use a program such as telnet, SSH, or vnc to connect to the virtual machines.

To connect to the network topology:

1. On the Topology page of the Junosphere interface, view the IP address and connection information for the Console port or management Ethernet of the virtual device.
2. With a topology active, on the Library page click **Connect** to go to the Junosphere Access Portal page.
  - a. Once the topology is started, you can use the portal URL for the duration of the session. The portal URL might change in a future session.
3. Enter your username and password and click **Sign In**.

The Network Connect page appears.

4. Click the Network Connect Start button.

Network Connect establishes a Secure Access SSL VPN to the internal management Ethernet of the topology. Traffic will be directed only to the local management Ethernet over that tunnel.

5. Connect to the virtual device using an appropriate communications program such as telnet, SSH, or vnc.
6. Log in to the virtual device using the default username and password.
7. If you are connecting to a Junos OS network device, enter **cli** to start using the Junos OS environment.

Just as with a physical Junos OS device, configuration changes are made in edit mode and then committed to implement the changes on the router. To save your changes to the library, click **Save** on the interface's Library menu. The device will reboot with the active configuration.

Details on using these pages are specified in the following sections.

## The Junosphere (Secure Access) Access Portal Page

Use the Junosphere Access Portal page to log in to the secure access to your virtual topology. Enter the username and password mailed to you by the Junosphere administrator. The Network Connect page displays.

Figure 11 on page 15 shows the Access Portal page.

Figure 11: Junosphere Access Portal Page

Welcome to the  
**Junosphere Access Portal**

Junosphere User  Please sign in to begin your secure session to your topology.

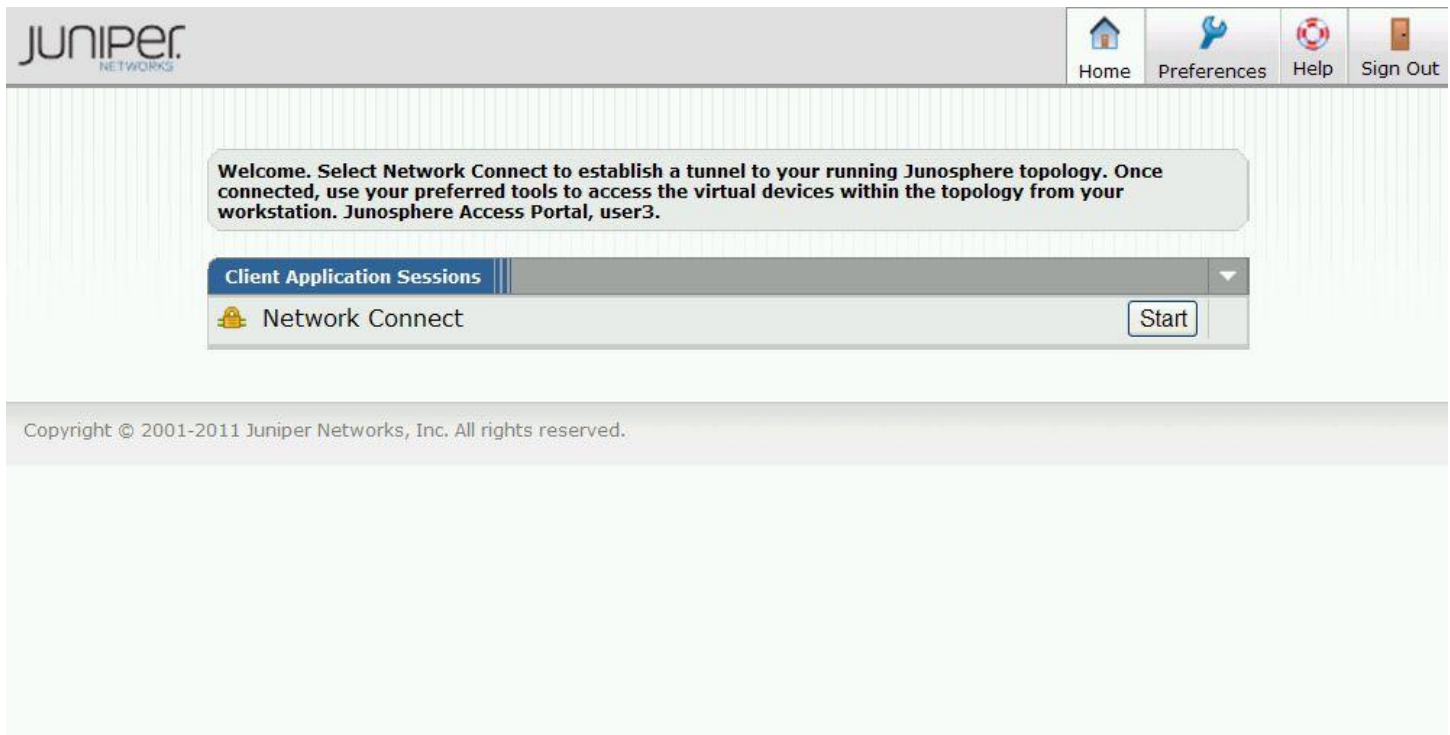
Password

## The Network Connect Page

Click the **Start** button on the Network Connect page to connect to the virtual devices in the network topology. Network Connect establishes a Secure Access SSL VPN to the internal management Ethernet of the topology. Traffic will be directed only to the local management Ethernet over that tunnel. Connect to a virtual device through the tunnel using an appropriate communications programs such as telnet, SSH, or vnc.

Figure 12 on page 16 shows the Network Connect page.

Figure 12: Network Connect Page



## Junosphere Connector Page

The Junosphere Connector page shows the points in the private topology to which you can connect a Junosphere Connector tunnel (and thereby connect an external physical network into the virtual topology). Select a connector to view the details. Click **View** to display the View Connector page.

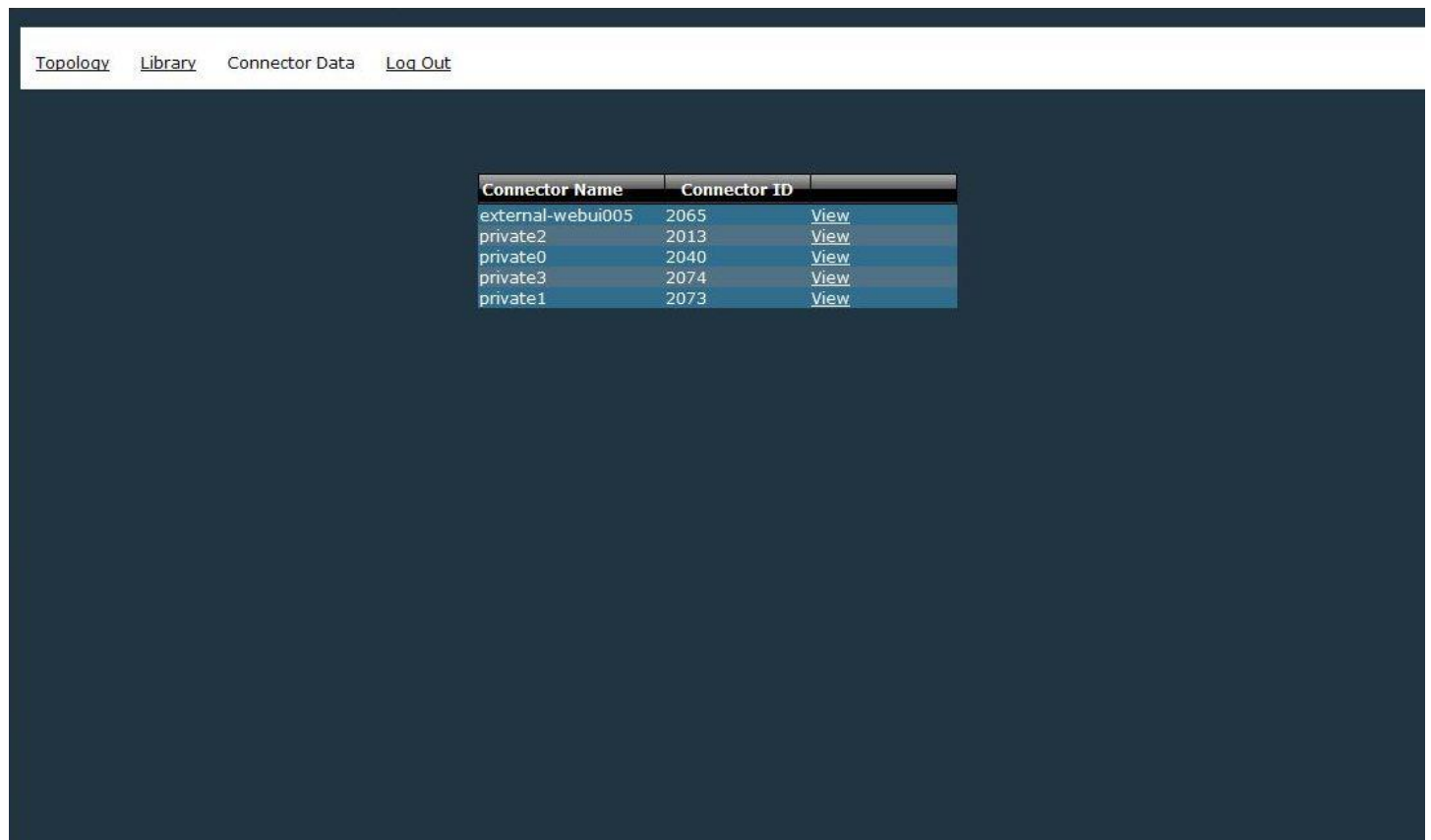


**NOTE:** You can only use Junosphere Connector if you buy SKU access.

Figure 12 on page 17 shows the Junosphere Connector page.



Figure 13: Junosphere Connector Page



The screenshot shows a web interface with a dark blue header and a light blue navigation bar. The navigation bar contains links for [Topology](#), [Library](#), [Connector Data](#), and [Log Out](#). The main content area is dark blue and features a table with connector information.

Connector Name	Connector ID	
external-webui005	2065	<a href="#">View</a>
private2	2013	<a href="#">View</a>
private0	2040	<a href="#">View</a>
private3	2074	<a href="#">View</a>
private1	2073	<a href="#">View</a>

## View Connector Page

The View Connector page shows details of traffic between a chosen Junosphere connector and a physical device. The page includes the following fields:

- Port — Virtual interface ID on each bridge to which the connector is attached.
- Packets In — The incoming traffic, in packets
- Bytes In — The incoming traffic, in bytes
- Packets Out — The outgoing traffic, in packets
- Bytes Out — The outgoing traffic, in bytes

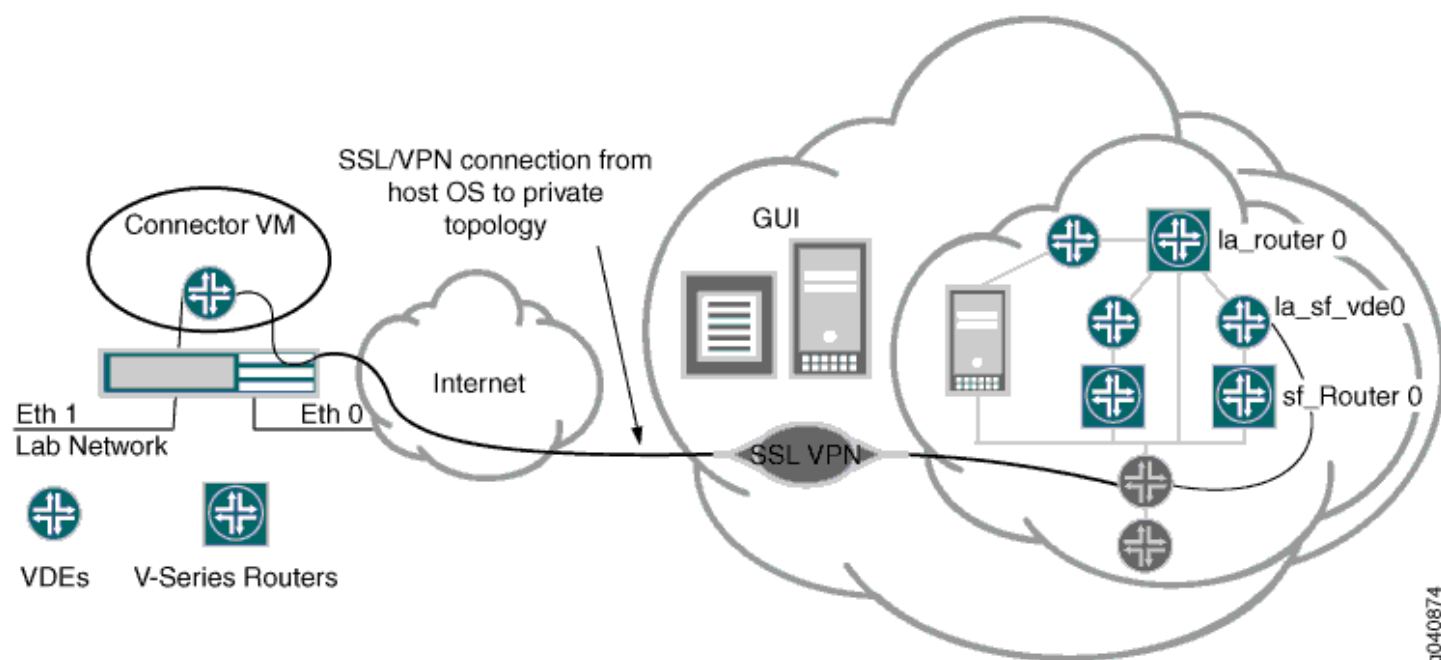
# JUNOSPHERE CONNECTOR

## Junosphere Connector Overview

The Junosphere Connector runs as a virtual machine connecting a virtual network to a physical network. The Junosphere Connector utilizes Virtual Distributed Ethernet (VDE) switches to connect to physical devices. It creates a VDE switch on a server connected to the physical device, a VDE switch connected to the virtual machine, and bridges the two VDE switches across an SSH:tunnel.

Figure 14 on page 18 shows a physical network connected to a virtual network via two VDE switches across an SSH tunnel. The `la_sf_vde0` is a bridge between `la_router0` and `sfRouter0`.

Figure 14: Physical Network Connected to a Virtual Network



The Junosphere Connector supports VMware Player on Linux and Windows.

## Hardware Requirements for Linux

The Junosphere Connector requires:

- Linux PC with two Ethernet ports: eth0 and eth1
- CentOS 5.4 Linux

## Hardware Requirements for Windows

The Junosphere Connector requires:

- Windows PC with two Ethernet ports: eth0 and eth1
- Windows XP or Windows 7

## Configuring Your PC

To configure your PC:

1. Configure a server or PC with two Ethernet ports, eth0 and eth1.
2. Configure eth0 to be your management port and eth1 as up but without an IP address.

## VMware Requirements

The Junosphere Connector software is a virtual machine running under VMware Player. In order for the Junosphere Connector virtual machine to run correctly, VMware must be configured with Junosphere in mind. By default, VMware Player is configured so that all network traffic traverses the first Ethernet interface no matter how many Ethernet interfaces you assign to a virtual machine. However, the Junosphere Connector must be able to:

- Connect to the Junosphere topology via one Ethernet port.
- Forward VDE network traffic to and from your physical devices via the second Ethernet port.

Because Junosphere Connector requires two Ethernet ports to work correctly, you need to configure VMware Player to use the second Ethernet port.

## Installing the VMware Player

---

The following sections describe how to download, install, modify, and run the VMware Player.

### Downloading VMware Player

You must be logged in as root in Linux or have admin privileges in Windows.

1. Download the VMware Player from <http://www.vmware.com/products/player/overview.html>.
2. Follow the prompts to download the program.

### Installing Junosphere Connector on Linux

To install Junosphere connector on Linux:

1. Log in as root.
2. Run the VMware Player bundle.

Customize the command for your player version.

```
[root@skykvm4 VMwarePlayer]# ./VMware-Player-3.1.3-324285.x86_64.bundle
Extracting VMware Installer...done.
```

- a. Enter **no** for the first two prompts.

```
Would you like to check for product updates on startup? [yes]: no
```

```
Would you like to help make VMware software better by sending
anonymous system data and usage statistics to VMware? [yes]: no
```

- b. Press **Enter** to begin.

```
The product is ready to be installed. Press Enter to begin
installation or Ctrl-C to cancel.
```

```
Installing VMware Player Application 3.1.3
Copying files...
[#####] 53%
```

## Installing Junosphere Connector on Windows

When the software download is saved, the Download Complete screen appears with the Run button. To install Junosphere Connector on Windows:

1. Click **Run** to display the VMware Player Setup installation wizard.

The installation wizard appears.

Figure 15: The VMware Player Installation Wizard



2. Click **Next** to run the installation wizard.

When the wizard completes, it prompts you to restart your PC.

## Configuring VMware Player to Use the Second Ethernet Port for Linux

To stop the process that is running on eth0 and get it running on eth1:

1. View the vmnet-bridge processes on your Linux PC.

```
ps aux | grep vmnet-bridge

root      4138  0.0  0.0  59292  504 ?        Ss   13:08   0:00 /usr/bin/vmnet-bridge -s
14 -d /var/run/vmnet-bridge-0.pid -n 0
root      4211  0.0  0.0  61164  736 pts/7    S+   13:09   0:00 grep bridge
```

2. Stop the vmnet-bridge process so that you can start a new one:

```
kill -9 process-id
```

```
kill -9 4138
```

3. Start a new vmnet-bridge process that uses eth1, the second Ethernet port:

```
vmnet-bridge -n 0 -i eth1 -d /var/run/vmnet.pid
```

## Configuring VMware Player to Use the Second Ethernet Port for Windows

To stop the process that is running on eth0 and get it running on eth1:

1. Start the Windows command line:

```
Start ->Run -> cmd
```

2. Change directories (cd) to the directory with the VMware Player installation files (usually C:\Program Files\vmplayer).
3. Run the installation file with the /e .\vmplayer arguments.

The .exe installation file may vary from the example below.

```
VMware-player-3.1.3-324285.exe /e .\vmplayer
```

4. In the vmplayer subdirectory, find the network.cab file.

```
cd vmplayer.
```

```
dir n*
```

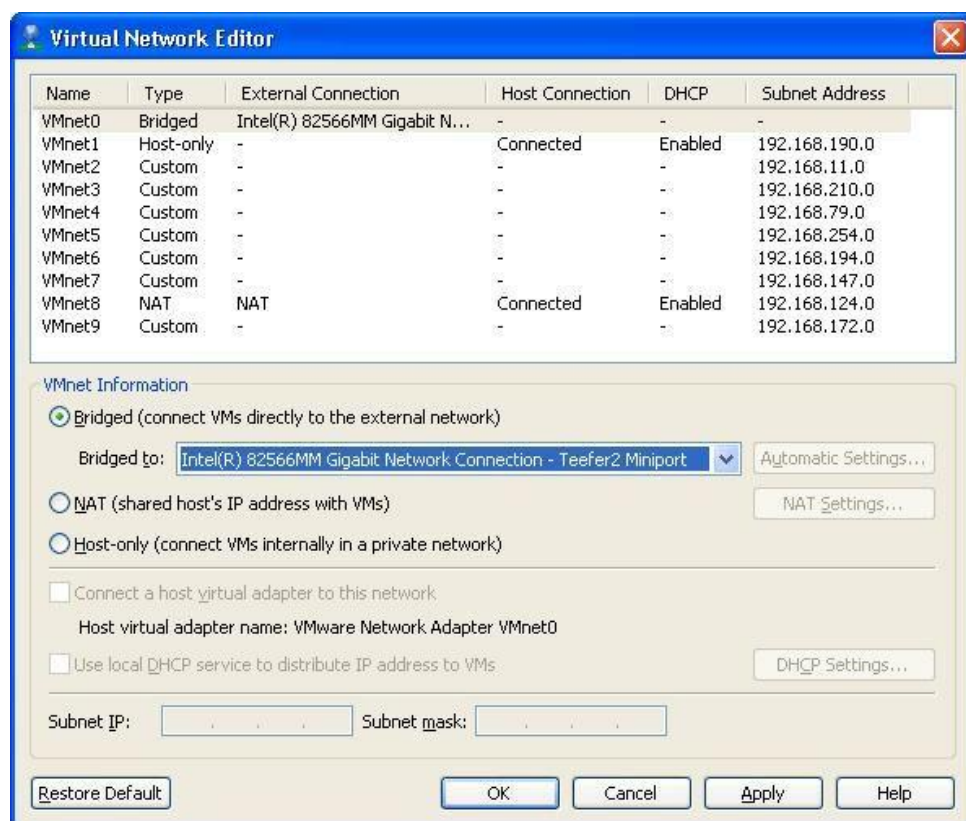
5. Extract the network.cab file.

How you extract the file depends on the Windows version and the extraction tools that you have available.

6. From the extracted files, copy vmnetcfg.exe to the directory where VMware Player was installed (usually c:/Program Files/VMWare/VMware Player).
7. Run Windows Explorer and navigate to the c:/Program Files/VMWare/VMware Player directory.
8. Run vmnetcfg.exe by double-clicking the .exe file.

The Virtual Network Editor screen appears. Figure 16 on page 22 shows the Virtual Network Editor.

Figure 16 : Virtual Network Editor



9. Select **VMnet0**.
10. Select **Bridged** to connect virtual machines directly to the external network.
11. Select the physical Ethernet port next to **Bridged to:**.
12. Click **Apply**.
13. Click **OK**.

## Starting VMPlayer on Linux

To start VMPlayer on Linux:

1. Set up your display according to your shell.

For example, for the Bash shell, enter:

```
export DISPLAY=crusher:0
```

2. Launch the VM Player.
  - a. Log in as root in a terminal window.
  - b. Enter `vmplayer &`.

```
vmplayer &
```

The Welcome to the VMPlayer window appears.



## Starting VMPlayer in Windows

To start VMPlayer in Windows:

1. Select **Start > All Programs > VMware > VMware Player**.

## Activating the Junosphere Topology

---

Before you can start Junosphere Connector, you must have the active topology running as follows:

1. Run the topology for the VDE you want to access:
  - a. Sign in to the user interface.
  - b. From the Library page, activate and start the topology you want to access.
  - c. Review the VDE information:
    - i. Display the Junosphere Connector page to show a list of VDEs for the active topology.
    - ii. Note the VDE to which you want to connect.
2. Run a Secure Access session.
  - a. With a topology active, on the Library page click **Connect** to go to the Junosphere Access Portal page.
  - b. Enter your username and password and click **Sign In..**  
The Network Connect page appears.
  - c. Click the Start button to launch the Secure Access SSL VPN and connect to your topology.

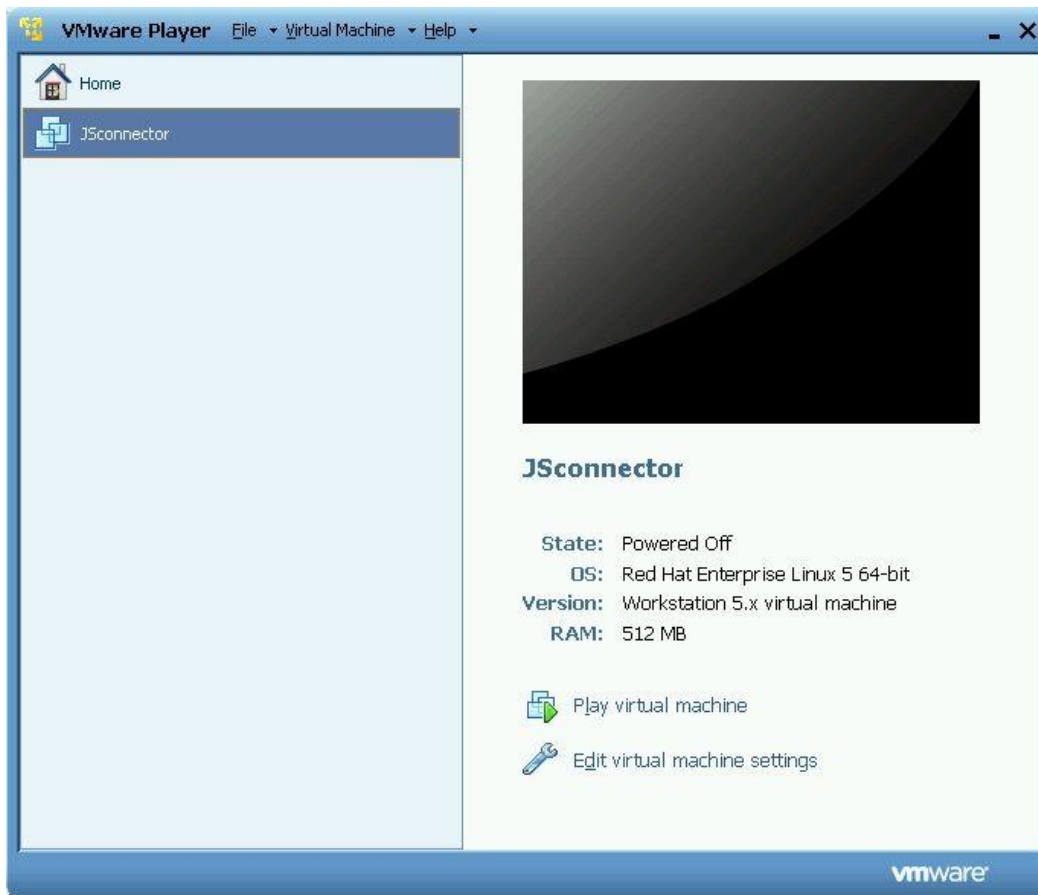
## Configuring and Starting Junosphere Connector

---

1. To configure and start Junosphere Connector:
  - a. Prepare the Junosphere Connector file.
    - i. Download the Junosphere Connector file from <http://www.juniper.net/customers/support/?jsconnector>.
    - ii. Extract the .zip file to a directory where you can access the Junosphere Connector .vmx file.
  - b. Open the Junosphere Connector .vmx file in VMware Player.
    - i. Navigate to the Junosphere Connector .vmx file.
    - ii. Select the Junosphere Connector .vmx file and click **Open**.

The JSconnector Virtual Machine screen appears. Figure 17 on page 24 shows the JSconnector Virtual Machine.

Figure 17: JSconnector Virtual Machine



2. Click Edit virtual machine settings.
  - a. Change the Network Adapter from Bridged to NAT.
  - b. Set Network Adapter2 to Bridged.
  - c. Save.
3. Click Play virtual machine.

A one-time pop-up window about keyboard appears.

  - a. Click **OK**.

A pop-up window about VMware tools appears.
  - b. Click Remind Me Later.

Wait for the Junosphere Connector VM to boot.
4. If needed, press **Control+ALT** to free the mouse.
5. Perform the initial network setup.
  - a. Scroll to Configure Network.
  - b. Enter **y** to use DHCP.

- c. Enter **n** to not use proxy.
- d. Log out.

## Using Junosphere Connector

To use Junosphere Connector:

1. With an active topology running and the Junosphere Connector virtual machine booted from prior steps, select the Junosphere Connector Virtual Machine terminal screen.
2. Log in to the terminal window as user=hconnect; password=hconnect.

```
Last login: Thu Mar 10 18:19:01 2011
```

```
Welcome to the Junosphere Connector virtual appliance. To get started, type:
```

```
/vmm/bin/hconnect -c <customer name> -i <bridge to connect to>
```

3. Locate the literal command you need to enter on the Junosphere Connector View page for your active technology.
4. Copy and paste the command from the Junosphere Connector View page or type **/vmm/bin/hconnect -u hconnect -b privateX -s junosphere.net** (where *privateX* is the name of your VDE) and press **Enter**.

```
[hconnect@localhost ~]$ hconnect -u hconnect -b private0 -s junosphere.net
```

```
Junosphere Connector Version: 1.1194-3
```

```
Checking connection to 10.233.255.254 [ok]
```

```
Starting Junosphere config connecting to 10.233.255.254
```

```
This command does not return. Ctrl-C to terminate the Hybridge connection.
```

```
The stats of the Hybridge connection will be displayed every 10 seconds until the connection is terminated
```

```
-----
date: Mon Apr 11 19:37:50 2011
-----
```

```
Port 0001: Local Hybridge connection
```

```
Port 0002: Remote Hybridge connection
```

```
Port 0001 untagged_vlan=0000 QnQ,Strict=0000,0 ACTIVE - Unnamed Allocatable
```

```
IN:  pkts      27      bytes      2358
```

```
OUT: pkts      20      bytes      1904
```

```
Port 0002 untagged_vlan=0000 QnQ,Strict=0000,0 ACTIVE - Unnamed Allocatable
```

```
IN:  pkts      20      bytes      1904
```

```
OUT: pkts      27      bytes      2358
```

## Connecting Your LAN

To connect your LAN to eth1:

1. Connect a cable to eth1.
2. Connect the other end to a switch.
3. Connect your other devices to that switch.

Packets from your VDE in your virtual topology will now go to your switch and then to your hardware equipment.

## Configuring VmWare ESX to Work with the Image

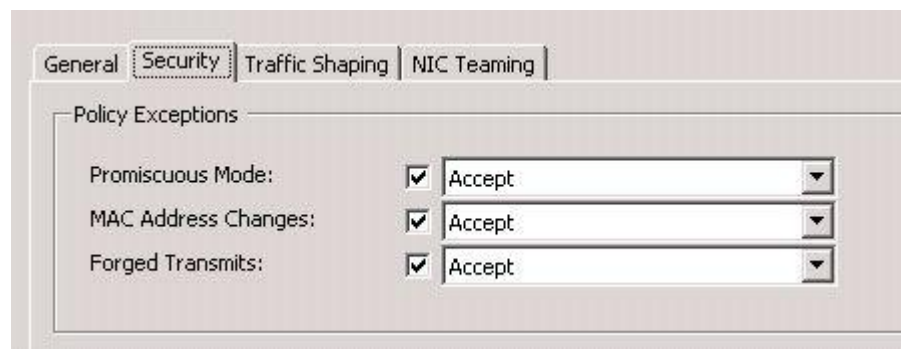
ESX has a security feature that by default rejects any promiscuous mode connections to a switch. Junosphere Connector requires a promiscuous connection to allow all packets coming from the customer side to be tunneled into the virtual switch chosen for your Junosphere topology.

The virtual switch that you connect to the port with the customer-side LAN traffic destined for the cloud must be set to allow promiscuous mode traffic.

To allow promiscuous mode traffic:

1. Connect to your vSphere client.
2. Navigate to the host on which your port group resides.
3. Access the properties of the virtual switch to which the port group is assigned.
4. Edit the properties of the port group:
  - a. Choose the security tab.
  - b. Select accept from the promiscuous drop-down box and click **Accept**.

You will now be able to use the Junosphere Connector. The following image shows the promiscuous drop-down box.



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