Legal Notices

Extreme Networks, Inc., on behalf of or through its wholly-owned subsidiary, Enterasys Networks, Inc., reserves the right to make changes in specifications and other information contained in this document and its website without prior notice. The reader should in all cases consult representatives of Extreme Networks to determine whether any such changes have been made.

The hardware, firmware, software or any specifications described or referred to in this document are subject to change without notice.

Trademarks

Extreme Networks and the Extreme Networks logo are trademarks or registered trademarks of Extreme Networks, Inc. in the United States and/or other countries.

All other names (including any product names) mentioned in this document are the property of their respective owners and may be trademarks or registered trademarks of their respective companies/owners.

For additional information on Extreme Networks trademarks, please see: www.extremenetworks.com/company/legal/trademarks/

Contact

If you require assistance, contact Extreme Networks using one of the following methods.

- **Global Technical Assistance Center (GTAC) for Immediate Support**
  - **Phone:** 1-800-998-2408 (toll-free in U.S. and Canada) or 1-603-952-5000. For the Extreme Networks support phone number in your country, visit: www.extremenetworks.com/support/contact
  - **Email:** support@extremenetworks.com. To expedite your message, enter the product name or model number in the subject line.

- **GTAC Knowledge** – Get on-demand and tested resolutions from the GTAC Knowledgebase, or create a help case if you need more guidance.

- **The Hub** – A forum for Extreme customers to connect with one another, get questions answered, share ideas and feedback, and get problems solved. This
community is monitored by Extreme Networks employees, but is not intended to replace specific guidance from GTAC.

- **Support Portal** – Manage cases, downloads, service contracts, product licensing, and training and certifications.
Extreme Networks® Software License Agreement

This Extreme Networks Software License Agreement is an agreement ("Agreement") between You, the end user, and Extreme Networks, Inc. ("Extreme"), on behalf of itself and its Affiliates (as hereinafter defined and including its wholly owned subsidiary, Enterasys Networks, Inc. as well as its other subsidiaries). This Agreement sets forth Your rights and obligations with respect to the Licensed Software and Licensed Materials. BY INSTALLING THE LICENSE KEY FOR THE SOFTWARE ("License Key"), COPYING, OR OTHERWISE USING THE LICENSED SOFTWARE, YOU ARE AGREING TO BE BOUND BY THE TERMS OF THIS AGREEMENT, WHICH INCLUDES THE LICENSE AND THE LIMITATION OF WARRANTY AND DISCLAIMER OF LIABILITY. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, RETURN THE LICENSE KEY TO EXTREME OR YOUR DEALER, IF ANY, OR DO NOT USE THE LICENSED SOFTWARE AND CONTACT EXTREME OR YOUR DEALER WITHIN TEN (10) DAYS FOLLOWING THE DATE OF RECEIPT FOR A REFUND. IF YOU HAVE ANY QUESTIONS ABOUT THIS AGREEMENT, CONTACT EXTREME, Attn: LegalTeam@extremenetworks.com.

1. DEFINITIONS. "Affiliates" means any person, partnership, corporation, limited liability company, or other form of enterprise that directly or indirectly through one or more intermediaries, controls, or is controlled by, or is under common control with the party specified. "Server Application" shall refer to the License Key for software installed on one or more of Your servers. "Client Application" shall refer to the application to access the Server Application. "Licensed Materials" shall collectively refer to the licensed software (including the Server Application and Client Application), Firmware, media embodying the software, and the documentation. "Concurrent User" shall refer to any of Your individual employees who You provide access to the Server Application at any one time. "Firmware" refers to any software program or code imbedded in chips or other media. "Licensed Software" refers to the Software and Firmware collectively.

2. TERM. This Agreement is effective from the date on which You install the License Key, use the Licensed Software, or a Concurrent User accesses the Server Application. You may terminate the Agreement at any time by destroying the Licensed Materials, together with all copies, modifications and merged portions in any form. The Agreement and Your license to use the Licensed Materials will also terminate if You fail to comply with any term of condition herein.
3. **GRANT OF SOFTWARE LICENSE.** Extreme will grant You a non-transferable, non-exclusive license to use the machine-readable form of the Licensed Software and the accompanying documentation if You agree to the terms and conditions of this Agreement. You may install and use the Licensed Software as permitted by the license type purchased as described below in License Types. The license type purchased is specified on the invoice issued to You by Extreme or Your dealer, if any. **YOU MAY NOT USE, COPY, OR MODIFY THE LICENSED MATERIALS, IN WHOLE OR IN PART, EXCEPT AS EXPRESSLY PROVIDED IN THIS AGREEMENT.**

4. **LICENSE TYPES.**

   - **Single User, Single Computer.** Under the terms of the Single User, Single Computer license, the license granted to You by Extreme when You install the License Key authorizes You to use the Licensed Software on any one, single computer only, or any replacement for that computer, for internal use only. A separate license, under a separate Software License Agreement, is required for any other computer on which You or another individual or employee intend to use the Licensed Software. A separate license under a separate Software License Agreement is also required if You wish to use a Client license (as described below).

   - **Client.** Under the terms of the Client license, the license granted to You by Extreme will authorize You to install the License Key for the Licensed Software on your server and allow the specific number of Concurrent Users shown on the relevant invoice issued to You for each Concurrent User that You order from Extreme or Your dealer, if any, to access the Server Application. A separate license is required for each additional Concurrent User.

5. **AUDIT RIGHTS.** You agree that Extreme may audit Your use of the Licensed Materials for compliance with these terms and Your License Type at any time, upon reasonable notice. In the event that such audit reveals any use of the Licensed Materials by You other than in full compliance with the license granted and the terms of this Agreement, You shall reimburse Extreme for all reasonable expenses related to such audit in addition to any other liabilities You may incur as a result of such non-compliance, including but not limited to additional fees for Concurrent Users over and above those specifically granted to You. From time to time, the Licensed Software will upload information about the Licensed Software and the associated devices to Extreme. This is to verify the Licensed Software is being used with a valid license. By using the Licensed Software, you consent to the transmission of this information. Under no circumstances, however, would Extreme employ any such measure to interfere with your normal and permitted operation of the Products, even in the event of a contractual dispute.

6. **RESTRICTION AGAINST COPYING OR MODIFYING LICENSED MATERIALS.** Except as expressly permitted in this Agreement, You may not copy or otherwise reproduce the Licensed Materials. In no event does the limited copying or reproduction permitted under this Agreement include the right to decompile, disassemble, electronically transfer, or reverse engineer the Licensed Software, or to translate the Licensed Software into another computer language.

   The media embodying the Licensed Software may be copied by You, in whole or in part, into printed or machine readable form, in sufficient numbers only for backup or archival purposes, or to replace a
worn or defective copy. However, You agree not to have more than two (2) copies of the Licensed Software in whole or in part, including the original media, in your possession for said purposes without Extreme’s prior written consent, and in no event shall You operate more copies of the Licensed Software than the specific licenses granted to You. You may not copy or reproduce the documentation. You agree to maintain appropriate records of the location of the original media and all copies of the Licensed Software, in whole or in part, made by You. You may modify the machine-readable form of the Licensed Software for (1) your own internal use or (2) to merge the Licensed Software into other program material to form a modular work for your own use, provided that such work remains modular, but on termination of this Agreement, You are required to completely remove the Licensed Software from any such modular work. Any portion of the Licensed Software included in any such modular work shall be used only on a single computer for internal purposes and shall remain subject to all the terms and conditions of this Agreement. You agree to include any copyright or other proprietary notice set forth on the label of the media embodying the Licensed Software on any copy of the Licensed Software in any form, in whole or in part, or on any modification of the Licensed Software or any such modular work containing the Licensed Software or any part thereof.

7. TITLE AND PROPRIETARY RIGHTS
   a. The Licensed Materials are copyrighted works and are the sole and exclusive property of Extreme, any company or a division thereof which Extreme controls or is controlled by, or which may result from the merger or consolidation with Extreme (its "Affiliates"), and/or their suppliers. This Agreement conveys a limited right to operate the Licensed Materials and shall not be construed to convey title to the Licensed Materials to You. There are no implied rights. You shall not sell, lease, transfer, sublicense, dispose of, or otherwise make available the Licensed Materials or any portion thereof, to any other party.

   b. You further acknowledge that in the event of a breach of this Agreement, Extreme shall suffer severe and irreparable damages for which monetary compensation alone will be inadequate. You therefore agree that in the event of a breach of this Agreement, Extreme shall be entitled to monetary damages and its reasonable attorney’s fees and costs in enforcing this Agreement, as well as injunctive relief to restrain such breach, in addition to any other remedies available to Extreme.

8. PROTECTION AND SECURITY. In the performance of this Agreement or in contemplation thereof, You and your employees and agents may have access to private or confidential information owned or controlled by Extreme relating to the Licensed Materials supplied hereunder including, but not limited to, product specifications and schematics, and such information may contain proprietary details and disclosures. All information and data so acquired by You or your employees or agents under this Agreement or in contemplation hereof shall be and shall remain Extreme’s exclusive property, and You shall use your best efforts (which in any event shall not be less than the efforts You take to ensure the confidentiality of your own proprietary and other confidential information) to keep, and have your employees and agents keep, any and all such information and data confidential, and shall not copy,
publish, or disclose it to others, without Extreme’s prior written approval, and shall return such information and data to Extreme at its request. Nothing herein shall limit your use or dissemination of information not actually derived from Extreme or of information which has been or subsequently is made public by Extreme, or a third party having authority to do so. You agree not to deliver or otherwise make available the Licensed Materials or any part thereof, including without limitation the object or source code (if provided) of the Licensed Software, to any party other than Extreme or its employees, except for purposes specifically related to your use of the Licensed Software on a single computer as expressly provided in this Agreement, without the prior written consent of Extreme. You agree to use your best efforts and take all reasonable steps to safeguard the Licensed Materials to ensure that no unauthorized personnel shall have access thereto and that no unauthorized copy, publication, disclosure, or distribution, in whole or in part, in any form shall be made, and You agree to notify Extreme of any unauthorized use thereof. You acknowledge that the Licensed Materials contain valuable confidential information and trade secrets, and that unauthorized use, copying and/or disclosure thereof are harmful to Extreme or its Affiliates and/or its/their software suppliers.

9. **MAINTENANCE AND UPDATES.** Updates and certain maintenance and support services, if any, shall be provided to You pursuant to the terms of an Extreme Service and Maintenance Agreement, if Extreme and You enter into such an agreement. Except as specifically set forth in such agreement, Extreme shall not be under any obligation to provide Software Updates, modifications, or enhancements, or Software maintenance and support services to You.

10. **DEFAULT AND TERMINATION.** In the event that You shall fail to keep, observe, or perform any obligation under this Agreement, including a failure to pay any sums due to Extreme, or in the event that you become insolvent or seek protection, voluntarily or involuntarily, under any bankruptcy law, Extreme may, in addition to any other remedies it may have under law, terminate the License and any other agreements between Extreme and You.

   a. Immediately after any termination of the Agreement or if You have for any reason discontinued use of Software, You shall return to Extreme the original and any copies of the Licensed Materials and remove the Licensed Software from any modular works made pursuant to Section 3, and certify in writing that through your best efforts and to the best of your knowledge the original and all copies of the terminated or discontinued Licensed Materials have been returned to Extreme.

   b. Sections 1, 7, 8, 10, 11, 12, 13, 14 and 15 shall survive termination of this Agreement for any reason.

11. **EXPORT REQUIREMENTS.** You are advised that the Software is of United States origin and subject to United States Export Administration Regulations; diversion contrary to United States law and regulation is prohibited. You agree not to directly or indirectly export, import or transmit the Software to any country, end user or for any Use that is prohibited by applicable United States regulation or statute (including but not limited to those countries embargoed from time to time by the United States
12. **UNITED STATES GOVERNMENT RESTRICTED RIGHTS.** The Licensed Materials (i) were developed solely at private expense; (ii) contain "restricted computer software" submitted with restricted rights in accordance with section 52.227-19 (a) through (d) of the Commercial Computer Software-Restricted Rights Clause and its successors, and (iii) in all respects is proprietary data belonging to Extreme and/or its suppliers. For Department of Defense units, the Licensed Materials are considered commercial computer software in accordance with DFARS section 227.7202-3 and its successors, and use, duplication, or disclosure by the U.S. Government is subject to restrictions set forth herein.

13. **LIMITED WARRANTY AND LIMITATION OF LIABILITY.** The only warranty that Extreme makes to You in connection with this license of the Licensed Materials is that if the media on which the Licensed Software is recorded is defective, it will be replaced without charge, if Extreme in good faith determines that the media and proof of payment of the license fee are returned to Extreme or the dealer from whom it was obtained within ninety (90) days of the date of payment of the license fee. NEITHER EXTREME NOR ITS AFFILIATES MAKE ANY OTHER WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, WITH RESPECT TO THE LICENSED MATERIALS, WHICH ARE LICENSED "AS IS". THE LIMITED WARRANTY AND REMEDY PROVIDED ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE EXPRESSLY DISCLAIMED, AND STATEMENTS OR REPRESENTATIONS MADE BY ANY OTHER PERSON OR FIRM ARE VOID. ONLY TO THE EXTENT SUCH EXCLUSION OF ANY IMPLIED WARRANTY IS NOT PERMITTED BY LAW, THE DURATION OF SUCH IMPLIED WARRANTY IS LIMITED TO THE DURATION OF THE LIMITED WARRANTY SET FORTH ABOVE. YOU ASSUME ALL RISK AS TO THE QUALITY, FUNCTION AND PERFORMANCE OF THE LICENSED MATERIALS. IN NO EVENT WILL EXTREME OR ANY OTHER PARTY WHO HAS BEEN INVOLVED IN THE CREATION, PRODUCTION OR DELIVERY OF THE LICENSED MATERIALS BE LIABLE FOR SPECIAL, DIRECT, INDIRECT, RELIANCE, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING LOSS OF DATA OR PROFITS OR FOR INABILITY TO USE THE LICENSED MATERIALS, TO ANY PARTY EVEN IF EXTREME OR SUCH OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL EXTREME OR SUCH OTHER PARTY'S LIABILITY FOR ANY DAMAGES OR LOSS TO YOU OR ANY OTHER PARTY EXCEED THE LICENSE FEE YOU PAID FOR THE LICENSED MATERIALS. Some states do not allow limitations on how long an implied warranty lasts and some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to You. This limited warranty gives You specific legal rights, and You may also have other rights which vary from state to state.

14. **JURISDICTION.** The rights and obligations of the parties to this Agreement shall be governed and construed in accordance with the laws and in the State and Federal courts of the State of California, without regard to its rules with respect to choice of law. You waive any objections to the personal jurisdiction and venue of these courts.

15. GENERAL.

a. This Agreement is the entire agreement between Extreme and You regarding the Licensed Materials, and all prior agreements, representations, statements, and undertakings, oral or written, are hereby expressly superseded and canceled.

b. This Agreement may not be changed or amended except in writing signed by both parties hereto.

c. You represent that You have full right and/or authorization to enter into this Agreement.

d. This Agreement shall not be assignable by You without the express written consent of Extreme. The rights of Extreme and Your obligations under this Agreement shall inure to the benefit of Extreme’s assignees, licensors, and licensees.

e. Section headings are for convenience only and shall not be considered in the interpretation of this Agreement.

f. The provisions of the Agreement are severable and if any one or more of the provisions hereof are judicially determined to be illegal or otherwise unenforceable, in whole or in part, the remaining provisions of this Agreement shall nevertheless be binding on and enforceable by and between the parties hereto.

g. Extreme’s waiver of any right shall not constitute waiver of that right in future. This Agreement constitutes the entire understanding between the parties with respect to the subject matter hereof, and all prior agreements, representations, statements and undertakings, oral or written, are hereby expressly superseded and canceled. No purchase order shall supersede this Agreement.

h. Should You have any questions regarding this Agreement, You may contact Extreme at the address set forth below. Any notice or other communication to be sent to Extreme must be mailed by certified mail to the following address:

Extreme Networks, Inc.
145 Rio Robles
San Jose, CA 95134 United States
ATTN: General Counsel
Table of Contents

Fabric User Guide Version 8.5 ................................................................. 1
Extreme Networks® Software License Agreement ........................................ 4
Table of Contents ..................................................................................... 10
Fabric Manager Installation ....................................................................... 14
Pre-Installation ......................................................................................... 14
Fabric Manager Installation Static Mode .................................................... 14
Adding Fabric Manager to Extreme Management Center ........................... 18
Getting Started ........................................................................................ 20
Requirements ............................................................................................ 20
Extreme Management Center Access Requirements .................................... 21
Use Case 1: Full Read/Write Access .......................................................... 22
Use Case 2: Read-Only Access .................................................................. 23
Use Case 3: Limited Read-Only Access ...................................................... 24
Use Case 4: End-System Information, Read-Only Access ............................ 24
Use Case 5: End-System Information, Read/Write Access ........................... 24
Browser Requirements .............................................................................. 24
Screen Resolution ....................................................................................... 25
Enable Report Data Collection .................................................................... 25
Enable Device Statistics Collection ............................................................. 25
Enabling Device Statistics Collection ......................................................... 26
Enable Interface Statistics Collection ........................................................ 27
Enabling Interface Statistics Collection ..................................................... 27
Enable Wireless Controller Statistics Collection ........................................ 28
Enabling Wireless Controller Statistics Collection ..................................... 29
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable Flow Collection</td>
<td>29</td>
</tr>
<tr>
<td>Enable Flow Collection on a Device</td>
<td>30</td>
</tr>
<tr>
<td>Enable Flow Collection on an Interface</td>
<td>30</td>
</tr>
<tr>
<td>Extreme Management Center Scalability</td>
<td>30</td>
</tr>
<tr>
<td>Extreme Management Center Timeout</td>
<td>31</td>
</tr>
<tr>
<td>How to Obtain and Apply an ExtremeCompliance License</td>
<td>31</td>
</tr>
<tr>
<td>How to Create a Fabric Topology Definition</td>
<td>32</td>
</tr>
<tr>
<td>Create a Topology Definition</td>
<td>32</td>
</tr>
<tr>
<td>Configure a Topology Definition</td>
<td>33</td>
</tr>
<tr>
<td>Fabric Name Tab</td>
<td>33</td>
</tr>
<tr>
<td>Fabric Summary tab</td>
<td>34</td>
</tr>
<tr>
<td>Rename a Topology Definition</td>
<td>35</td>
</tr>
<tr>
<td>Delete a Topology Definition</td>
<td>35</td>
</tr>
<tr>
<td>How to Create a Fabric Service Definition</td>
<td>36</td>
</tr>
<tr>
<td>Create a Service Definition</td>
<td>37</td>
</tr>
<tr>
<td>Service Definition Panel</td>
<td>37</td>
</tr>
<tr>
<td>Rename a Service Definition</td>
<td>37</td>
</tr>
<tr>
<td>Delete a Service Definition</td>
<td>38</td>
</tr>
<tr>
<td>Services</td>
<td>39</td>
</tr>
<tr>
<td>VRF Definition</td>
<td>40</td>
</tr>
<tr>
<td>VLAN Definition</td>
<td>40</td>
</tr>
<tr>
<td>Service Application Name</td>
<td>42</td>
</tr>
<tr>
<td>L2 VSN</td>
<td>43</td>
</tr>
<tr>
<td>L3 VSN</td>
<td>45</td>
</tr>
<tr>
<td>Fabric</td>
<td>47</td>
</tr>
<tr>
<td>Accessing Fabric in Extreme Management Center</td>
<td>48</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Fabric Tab</td>
<td>49</td>
</tr>
<tr>
<td>Fabric Connect</td>
<td>51</td>
</tr>
<tr>
<td>Left-Panel Tree</td>
<td>52</td>
</tr>
<tr>
<td>Fabric Connect Folder</td>
<td>52</td>
</tr>
<tr>
<td>Fabric Attach Folder</td>
<td>53</td>
</tr>
<tr>
<td>Right-Panel Topology Map</td>
<td>54</td>
</tr>
<tr>
<td>Topology Tab Tools</td>
<td>54</td>
</tr>
<tr>
<td>Topology Tab Buttons</td>
<td>55</td>
</tr>
<tr>
<td>Fabric Manager ZTP+ Configuration</td>
<td>56</td>
</tr>
<tr>
<td>General Network Configuration</td>
<td>56</td>
</tr>
<tr>
<td>How to Create a Service Application</td>
<td>57</td>
</tr>
<tr>
<td>Create a Service Application</td>
<td>57</td>
</tr>
<tr>
<td>Rename a Service Application</td>
<td>58</td>
</tr>
<tr>
<td>Delete a Service Application</td>
<td>58</td>
</tr>
<tr>
<td>How to Add Fabric Manager</td>
<td>59</td>
</tr>
<tr>
<td>Adding Fabric Manager to Extreme Management Center</td>
<td>59</td>
</tr>
<tr>
<td>Add CLI Credentials</td>
<td>59</td>
</tr>
<tr>
<td>Create Administration Profile</td>
<td>60</td>
</tr>
<tr>
<td>Add Administration Profile to the Fabric Manager engine</td>
<td>61</td>
</tr>
<tr>
<td>ZTP+ Discovery</td>
<td>62</td>
</tr>
<tr>
<td>Applying Fabric Services</td>
<td>63</td>
</tr>
<tr>
<td>Applying a Fabric Topology to a Site</td>
<td>63</td>
</tr>
<tr>
<td>Applying a Service Application to a Site</td>
<td>64</td>
</tr>
<tr>
<td>Applying Fabric to Port Templates</td>
<td>65</td>
</tr>
<tr>
<td>Applying Fabric to Ports</td>
<td>66</td>
</tr>
<tr>
<td>Applying Fabric Services to a Device</td>
<td>68</td>
</tr>
</tbody>
</table>
Fabric Manager Installation

Install the Fabric Manager virtual machine (VM) to enable Fabric Manager in Extreme Management Center.

Pre-Installation

The Fabric Manager is distributed in a deployable VMware-based .OVA template, which is similar to the other ZTP+ (Zero Touch Provisioning Plus)-based engines (for example, ExtremeControl).

The Fabric Manager supports two initial configuration modes for Extreme Management Center discovery and registration:

- DHCP Mode
- Static Mode

The DHCP mode is the default configuration mode during the Fabric Manager VM’s initial startup. Use the static mode when providing a predefined set of networking configurations.

Fabric Manager Installation Static Mode

Fabric Manager begins installation in DHCP mode by default. Switch to static mode at any time during the initial installation by pressing the ENTER key.

Use the following instructions to install Fabric Manager in static mode:

1. In the Console tab of the vSphere client, login as root with no password and press Enter.
2. Follow the installation process to complete installation of static mode:
   a. Begin the set-up.
b. Set a root password by entering y.

c. Enter and re-type a UNIX password at the next prompt.

The Static Configuration screen opens.

d. Enter a hostname.

e. Enter the IP address for the VM engine.

f. Enter the default IP Network netmask address.

g. Enter the default Gateway address.

h. Enter the IP address of the name server.

i. Enter the domain name specific to the table.

j. Enter the Extreme Management Center server IP address.

The Date and Time Configuration screen opens.
k. Enter `y` at the next prompt to use NTP (Network Time Protocol).

l. Enter the NTP Server IP Address.

m. Enter `n` at the next prompt to skip adding another NTP server. This is optional.

n. Enter the default `0` and accept the current settings and continue.

o. Select the correct Time Zone for your network.
p. Enter the number that corresponds to your time zone.

The Fabric Manager Network Configuration screen displays a summary of the configuration options you selected.

q. Enter 0 to confirm all the selections displayed are correct.

To modify any selection, enter the corresponding number of the item you want to change.

r. A Setup Complete message displays once installation is complete.

Adding Fabric Manager to Extreme Management Center

Once you install the Fabric Manager virtual machine (VM), you can add it to Extreme Management Center and enable it via ZTP+ (Zero Touch Provisioning Plus) functionality.
NOTE: You need to upgrade the firmware in Extreme Management Center to add and launch the Fabric Manager engine.

Related Information

For information on related tabs:

- How to Upgrade Firmware in Extreme Management Center
- Fabric Manager ZTP+ Configuration in Extreme Management Center
- Extreme Management Center Fabric
Getting Started

This topic provides information to help you get started using Extreme Management Center to view network data. It includes information on configuring Extreme Management Center access requirements, including several different access scenarios. It also provides steps for enabling the statistics and flow collection that provides Extreme Management Center reporting data, and information on Extreme Management Center scalability.

- **Requirements**
  - **Extreme Management Center Access Requirements**
    - Full Read/Write Access
    - Read-Only Access
    - Limited Read-Only Access
    - End-System Information, Read-Only Access
    - End-System Information, Read/Write Access
  - **Browser Requirements**
  - **Screen Resolution**
  - **Enable Report Data Collection**
    - Enable Device Statistics Collection
    - Enable Interface Statistics Collection
    - Enable Wireless Controller Statistics Collection
  - **Enable Flow Collection**
    - Enable Flow Collection on a Device
    - Enable Flow Collection on an Interface
  - **Extreme Management Center Scalability**
  - **Extreme Management Center Timeout**

**Requirements**

This section provides information on license requirements for the different Extreme Management Center features, as well as access requirements, browser requirements, and screen resolution requirements.
Extreme Management Center Access Requirements

Access to the Extreme Management Center application and its features is determined by the user's membership in an Extreme Management Center authorization group and the group's assigned capabilities. The following table lists the different Extreme Management Center access options and features, and their corresponding capabilities.

To have full read/write access to all Extreme Management Center functionality, a user must be a member of an authorization group with the capabilities shown in the following table. Optionally, users can be configured to have read-only and limited read-only access to Extreme Management Center functionality by selecting a combination of capabilities.

<table>
<thead>
<tr>
<th>Extreme Management Center Access Options and Features</th>
<th>Required Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Launch Extreme Management Center.</td>
<td>NetSight OneView &gt; Access OneView</td>
</tr>
<tr>
<td>Allows the ability to launch the Extreme Management Center application.</td>
<td></td>
</tr>
<tr>
<td>View Extreme Management Center Reports.</td>
<td>NetSight OneView &gt; Access OneView Reports</td>
</tr>
<tr>
<td>Adds the ability to view reporting data.</td>
<td></td>
</tr>
<tr>
<td>View Extreme Management Center Maps.</td>
<td>NetSight OneView &gt; Maps &gt; Maps Read Access</td>
</tr>
<tr>
<td>Adds the ability to view maps.</td>
<td></td>
</tr>
<tr>
<td>View and Configure Extreme Management Center Maps.</td>
<td>NetSight OneView &gt; Maps &gt; Maps Read/Write Access</td>
</tr>
<tr>
<td>Adds the ability to view and configure maps.</td>
<td></td>
</tr>
<tr>
<td>View Extreme Management Center Wireless.</td>
<td>NetSight Console &gt; Wireless Manager &gt; Launch</td>
</tr>
<tr>
<td>Adds the ability to view wireless data.</td>
<td></td>
</tr>
<tr>
<td>View Extreme Management Center Administration.</td>
<td>NetSight OneView &gt; Access OneView Administration</td>
</tr>
<tr>
<td>Adds access to the Extreme Management Center administration tools and the ability to enable data collection.</td>
<td></td>
</tr>
<tr>
<td>View Extreme Management Center Search.</td>
<td>NetSight OneView &gt; Access OneView Search</td>
</tr>
<tr>
<td>Adds the ability to use the Extreme Management Center Search functionality.</td>
<td></td>
</tr>
<tr>
<td>View Extreme Management Center Network and Alarms and Events.</td>
<td>NetSight OneView &gt; Events and Alarms &gt; OneView Event Log Access</td>
</tr>
<tr>
<td>Adds the ability to view device information and event log details.</td>
<td></td>
</tr>
<tr>
<td>View Extreme Management Center alarms.</td>
<td>NetSight OneView &gt; Events and Alarms &gt; OneView Alarms Read Access</td>
</tr>
<tr>
<td>Adds the ability to view current alarms in the Alarms and Events page.</td>
<td></td>
</tr>
<tr>
<td>View and clear Extreme Management Center alarms.</td>
<td>NetSight OneView &gt; Events and Alarms &gt; OneView Alarms Read/Write Access</td>
</tr>
<tr>
<td>Adds the ability to view and clear alarms in the Alarms and Events page.</td>
<td></td>
</tr>
<tr>
<td>View Extreme Management Center Control.</td>
<td>NetSight OneView &gt; Identity and Access &gt; Access OneView Identity and Access Reports</td>
</tr>
<tr>
<td>Adds the ability to view Dashboard, System, Health, and Data Center reports under the Control tab.</td>
<td></td>
</tr>
<tr>
<td>View Extreme Management Center Control end-systems table.</td>
<td>NetSight OneView &gt; Identity and Access &gt; OneView End-Systems Read Access</td>
</tr>
<tr>
<td>Adds the ability to view end-system information under the Control tab.</td>
<td></td>
</tr>
<tr>
<td>View and modify Extreme Management Center Control end-systems table.</td>
<td>NetSight OneView &gt; Identity and Access &gt; OneView End-Systems Read/Write Access</td>
</tr>
<tr>
<td>Adds the ability to perform actions in the end-systems table, such as forcing reauthentication and changing an end-system's group membership.</td>
<td></td>
</tr>
</tbody>
</table>
Here are several scenarios that show how different Extreme Management Center user access levels can be configured based on assigned capabilities.

### Use Case 1: Full Read/Write Access

To provide full read/write access to all Extreme Management Center functionality, configure user membership in an authorization group assigned the following capabilities:

- NetSight OneView > Access OneView
- NetSight OneView > Access OneView Reports
Use Case 2: Read-Only Access

To provide read-only access to all Extreme Management Center reports and FlexViews, configure user membership in an authorization group assigned the following capabilities:

- NetSight OneView > Access OneView
- NetSight OneView > Access OneView Reports
- NetSight OneView > Access OneView Search
- NetSight OneView > NetFlow Read Access
- NetSight OneView > Maps > Maps Read Access
• NetSight Console > Wireless Manager > Launch
• NetSight OneView > Events and Alarms > OneView Event Log Access
• NetSight OneView > Events and Alarms > OneView Alarms Read Access
• NetSight OneView > FlexView > OneView FlexView Read Access
• NetSight OneView > Identity and Access > Access OneView Identity and Access Reports
• NetSight OneView > Identity and Access > OneView End-Systems Read Access
• NetSight OneView > Identity and Access > OneView Group Read Access

Use Case 3: Limited Read-Only Access

To provide limited read-only access to only Extreme Management Center reporting and wireless data, configure user membership in an authorization group assigned the following capabilities:

• NetSight OneView > Access OneView
• NetSight OneView > Access OneView Reports
• NetSight Console > Wireless Manager > Launch

Use Case 4: End-System Information, Read-Only Access

To provide read-only access to Extreme Management Center end-system information, configure user membership in an authorization group assigned the following capabilities:

• NetSight OneView > Access OneView
• NetSight OneView > Identity and Access > OneView End-Systems Read Access

Use Case 5: End-System Information, Read/Write Access

To provide read/write access to Extreme Management Center end-system information, configure user membership in an authorization group assigned the following capabilities:

• NetSight OneView > Access OneView
• NetSight OneView > Identity and Access > OneView End-Systems Read/Write Access

Browser Requirements

The following web browsers are supported:
Enable Report Data Collection

- Microsoft Edge and Internet Explorer version 11
- Mozilla Firefox 34 and later
- Google Chrome 33.0 and later

Browsers must have JavaScript enabled in order for the web-based views to function.

While it is not required that cookies are enabled, impaired functionality results if they are not. This includes (but is not limited to) the ability to generate PDFs and persist table configurations such as filters, sorting, and column selections.

Screen Resolution
For optimum display of graphs and tables, Extreme Management Center is best viewed on a system with a minimum screen resolution of 1280x1024.

Enable Report Data Collection
To view Extreme Management Center reporting data, you must enable statistics collection for your network devices. You must be a member of an authorization group that has been assigned the NetSight OneView > Access NetSight OneView and Administration capability to enable data collection. Data collection is only available with the NMS license and above.

Enable Device Statistics Collection
To view Extreme Management Center device reports, you must enable statistics collection for your network devices from either Extreme Management Center Devices, or the Console device tree or Device Properties tab. Statistics can be collected in a historical collection mode or a monitor collection mode.

- **Historical Mode** – Device and physical port statistics are saved to the database and aggregated over time, and are then used in Extreme Management Center reports. The device statistics are also used for active threshold alarms configured in the Console Alarms Manager.

  **NOTE:** Enabling Historical Device Statistics Collection may use substantial disk space.

- **Monitor Mode** – Device statistics are saved to a Monitor cache for one hour and then dropped. These statistics are used for active threshold alarms, configured in the Console Alarms Manager, but not for Extreme Management Center reporting.
**Enable Report Data Collection**

**NOTE:** The Monitor mode option is not available if you have disabled Monitor Collection in the OneView Collector Advanced Settings window in Administration > Options.

If you are enabling statistics collection on an ExtremeControl engine, Application Detection engine, or ExtremeWireless Controller, read through the following notes:

- **ExtremeControl Engine**
  When collecting statistics on an ExtremeControl engine, the engine must be added to Extreme Management Center to collect all engine statistics. In addition, Monitor mode is not supported on ExtremeControl engines.

- **Application Detection Engine**
  When collecting statistics on an Application Detection engine, the engine must be added to the Analytics > Configuration > ExtremeAnalytics Engines table in order for Extreme Management Center to collect all Application Detection statistics. In addition, Monitor mode is not supported on Application Detection engines.

- **ExtremeWireless Controller**
  Wireless Controller statistics collection is configured separately from other devices.

**Enabling Device Statistics Collection**

Use the following steps to enable device statistics collection.

1. You can enable statistics collection from either Extreme Management Center or Console:
   - In the **Network** tab, right-click one or more devices (multiple devices must be in the same device family) and select **Device > Collect Device Statistics**. You can also click the **Menu** icon (≡) in the upper left corner of the **Network** tab and select **Device > Collect Device Statistics**.
   - In the Console device tree or **Device Properties** tab, right-click one or more devices (multiple devices must be in the same device family) and select **OneView > Collect Device Statistics**.

2. From the Collect Device Statistics window, select the statistic collection mode you want to use: **Historical** or **Monitor**.
All active threshold alarms configured in the Extreme Management Center Alarms and Events tab (for the selected device family) that use the collected statistics display in the Active Threshold Alarm Summary box. If the selected devices do not match any active threshold alarms, this box is blank. To reduce unnecessary statistic collection, do not enable Monitor mode on devices that do not match any active threshold alarms.

**TIP:** A summary event is generated daily in the Alarms and Events > Events tab that shows the number of device with statistic collection enabled where corresponding threshold alarms are not configured.

3. Click OK. Extreme Management Center begins collecting statistics for the selected devices.

### Enable Interface Statistics Collection

To view Extreme Management Center interface reports, you must enable statistics collection for your device interfaces from either the Extreme Management Center Network tab, or the Console Port Properties tab or Interface Summary FlexView. Statistics can be collected in a historical collection mode or a monitored collection mode.

- **Historical Mode** – Interface statistics are saved to the database and aggregated over time, used in Extreme Management Center reports. The interface statistics are also used for active threshold alarms configured in the Alarms and Events tab.

- **Monitor Mode** – Interface statistics are saved to a Monitor cache for one hour and then dropped. These statistics are used for active threshold alarms configured in the Console Alarms Manager, but not for Extreme Management Center reporting. (Note that the Monitor mode option is not available if you have disabled Monitor Collection in the OneView Collector Advanced Settings window in the Administration > Options tab.)

### Enabling Interface Statistics Collection

Use the following steps to enable interface statistics collection.
1. You can enable statistics collection from either Extreme Management Center or Console:
   - On the **Network** tab, click on the device name link to open the Interface Summary FlexView. In the FlexView, right-click on one or more interfaces and select Collect Interface Statistics.
   - On the **Network** tab, right-click on a device and select Port Tree. In the Port Tree, select an interface, right-click and select **Collect Interface Statistics**.
   - In the **Console Port Properties** tab or Interface Summary FlexView, right-click one or more interfaces and select the OneView > Collect Interface Statistics.

2. From the Collect Device Statistics window, select the statistic collection mode you want to use: **Historical** or **Monitor**.

   ![Collect Device Statistics](image)

   All active threshold alarms configured in the Extreme Management Center **Alarms and Events** tab (for the selected device family) that use the collected statistics display in the Active Threshold Alarm Summary box. If the selected devices do not match any active threshold alarms, this box is blank. To reduce unnecessary statistic collection, do not enable Monitor mode on devices that do not match any active threshold alarms.

   **TIP:** A summary event is generated daily in the **Alarms and Events > Events** tab that shows the number of device with statistic collection enabled where corresponding threshold alarms are not configured.

3. Click **OK**. Extreme Management Center begins collecting statistics for the selected interfaces.

### Enable Wireless Controller Statistics Collection

Wireless Controller statistics collection is configured separately from other devices. When you enable Wireless Controller statistics collection, it includes Wireless Controller, WLAN, Topology, and AP wired and wireless statistics, and you also have the option to collect wireless client statistics.
You can enable statistics collection for multiple controllers, however the group cannot contain a mix of devices and wireless controllers. The group must include only controllers.

**Enabling Wireless Controller Statistics Collection**

Use the following steps to enable wireless controller statistics collection.

1. You can enable statistics collection from either Extreme Management Center or Console:
   - On the **Network** tab, right-click one or more wireless controllers and select **Device > Collect Device Statistics**. You can also click the menu icon (≡) in the upper left corner of the **Network** tab and select **Device > Collect Device Statistics**.
   - In the Console device tree or **Device Properties** tab, right-click one or more wireless controllers and select **OneView > Collect Device Statistics**.

2. From the Collect Controller Statistics window, select the statistics you want to collect.

3. Click **OK**. Extreme Management Center begins collecting statistics for the selected controllers.

**Enable Flow Collection**

To view Extreme Management Center Flow and Application reports, you must enable NetFlow or application telemetry on the device and enable flow collection for the device interfaces. N-Series, S-Series, and K-Series devices support NetFlow flow collection and ExtremeXOS devices support application telemetry flow collection. You must be a member of an authorization group assigned the NetSight OneView > NetFlow Read/Write Access capability to view NetFlow data or the NetSight OneView > Application Telemetry Read/Write Access capability to view application telemetry data and enable flow collection in Extreme Management Center. Flow collection is only available with the NMS-ADV license.
Enable Flow Collection on a Device

In Extreme Management Center, open the Advanced Configuration panel. Select an ExtremeAnalytics engine and use the Flow Collection Type drop-down to select the type of flow collection supported by your device. Use the Flow Sources or Application Telemetry Sources section of the window (depending on the Flow Collection Type selected) to add a device as a flow collection source.

Enable Flow Collection on an Interface

In PortView, you can enable flow collection from the Configure Collection State section of the Interface Details tab.

Extreme Management Center Scalability

Extreme Management Center supports reporting on 20,000 objects as determined by the number of devices and interfaces being monitored, along with polling interval and data storage periods. Below are two example network configurations resulting in collected objects under 20,000. For additional information on tuning your deployment, please contact Extreme Networks Support.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Retention</td>
<td>Raw Data</td>
<td>7 Days</td>
</tr>
<tr>
<td></td>
<td>Hourly Rollups</td>
<td>8 Weeks</td>
</tr>
<tr>
<td></td>
<td>Daily Rollups</td>
<td>6 Months</td>
</tr>
<tr>
<td>Polling Interval</td>
<td>15 Minutes</td>
<td>15 Minutes</td>
</tr>
<tr>
<td>Devices</td>
<td>Wireless Controllers</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Wireless APs</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>Advanced Switch/Routers</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>Advanced Interfaces</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>Servers</td>
<td>150</td>
</tr>
<tr>
<td>Collected Objects</td>
<td>19,450</td>
<td>18,630</td>
</tr>
</tbody>
</table>
**Extreme Management Center Timeout**

Extreme Management Center automatically times out after a specified amount of time, specified in the **HTTP Session Timeout** section of the Web Server view in the **Administration > Options** tab. A dialog box appears to warn you when you are two minutes from timing out of an Extreme Management Center web page. For additional information, see the Web Server Options Help topic.

**How to Obtain and Apply an ExtremeCompliance License**

To use the **Compliance** tab in Extreme Management Center, an additional license is required.

To obtain and apply the license in Extreme Management Center:

1. Contact your sales representative to purchase an ExtremeCompliance license.

   An email voucher is generated and sent to you with instructions.

2. Create an Extreme Networks Support Portal account, if necessary.
   a. Open a browser and go to [https://secure.extremenetworks.com/](https://secure.extremenetworks.com/).
   b. Enter your information and click **Create An Account**.

   An email is sent to you with instructions to activate your account.

   c. Click the link in your email.

   The Portal - Account Activation web page displays.

   d. Enter your **Email Address** and the **Activation Code** included in your activation email, if they do not automatically populate.

   e. Click **Activate**.


4. Enter your **Email** and **Password** and click **Log In**.

5. Click **Generate License**.

   The Generate License window displays.
6. Enter your **Voucher ID** from the email voucher sent to you and click **Next**.
7. Select the **Terms and Conditions** checkbox and click **Submit**.

   A window displays with your software license key.
8. Copy the license key from the window.
9. Open Extreme Management Center.
10. Access the **Administration > Diagnostics** tab.
11. Select **Server > Server Licenses** in the left-panel.

   The **Server Licenses** panel displays.
12. Click **Add**.

   The **Add License** window displays.
13. Paste the license key you copied in Step 9 and click **OK**.
15. The **Compliance** tab is now available in the menu, allowing you to use ExtremeCompliance audit functionality.

---

**Related Information**

For information on related tabs:

- [ExtremeCompliance Overview](#)
- [Diagnostics](#)

---

**How to Create a Fabric Topology Definition**

You can create a **Topology Definition** and a LAG (link aggregation group) **Topology Definition** on the **Sites** tab in Extreme Management Center. Once you create topology definitions, you can add them to sites in your network to build a fabric topology map.

**Create a Topology Definition**

To create a topology definition:
How to Create a Fabric Topology Definition

1. Access the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Navigate to **Topology Definitions** in the left-panel tree.
4. Right-click **Topology Definitions**.
5. Click **Create Topology Definition**.

![Create Fabric Topology Definition window](image)

The **Create Topology Definition** window opens.

6. Enter a name in the **Name** field.
7. Select **Fabric Connect** from the **Fabric Type** drop-down.
8. Click **OK** to create the topology definition.

**Configure a Topology Definition**

Once the topology definition is created, it is available in the Sites tab left-panel tree. Click it to open a new right panel that includes the **Fabric Name** tab and a **Fabric Summary** tab.

**Fabric Name Tab**

Use the **Fabric Name** tab to configure the topology definition.
To configure the topology definition:

2. Enter the Primary Backbone VLAN (BVLAN).
3. Enter the Secondary BVLAN.
4. Click the Add button (Add) in the DVR Interface Settings section.
5. Enter a DVR Domain name in the Name Field.
6. Enter an ID number in the Domain ID field.
7. Click Update.
8. Click Save

Once the topology definition is created and configured, you can apply it to a site within your network. Once fabric topologies have been assigned to a site, they cannot be deleted.

**Fabric Summary tab**

The Fabric Summary tab lists any fabric topologies you have created and the sites to which they are assigned.
Rename a Topology Definition

Once a topology definition has been created and configured, you can change or modify its name.

To rename a topology definition:

1. Open the Devices tab.
2. Select Sites from the left-panel tree drop-down list.
3. Expand Topology Definitions in the left-panel.
4. Right-click the topology definition you are renaming.
5. Click Rename Topology Definition.
6. Enter a new name in the Name field.
7. Click OK to change the topology name.

Delete a Topology Definition

Once a topology definition has been created and configured, you can delete it; however, a topology definition cannot be deleted once it has been assigned to a site.

To delete a topology definition:
1. Open the **Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Expand the **Topology Definitions** in the left-panel.
4. Right-click the topology definition you are deleting.
5. Click **Delete Topology Definition**.
6. Click **Yes** to delete the topology definition you selected.

**Related Information**

For information on related topics:

- **Services**
- **Fabric**
- **Sites**
- **Devices**

**How to Create a Fabric Service Definition**

You can create a service definition in the **Sites** tab in Extreme Management Center. Service definitions display information configured in service applications definitions.
Once created, service definitions are added to sites in your network and are used to build a fabric topology map.

**Create a Service Definition**

To create a service definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Select **Service Definitions** in the left-panel.
4. Right-click **Service Definitions**.
5. Click **Create Service Definition**.

![Create Service Definition window](image)

The **Create Service Definition** window opens.

6. Enter a name in the **Name** field.
7. Select **Fabric Connect** from the **Type** drop-down list.
8. Click **OK** to create the service definition.

Once the service definition is created and configured, you can apply it to a site within your network. Once fabric services have been assigned to a site, they cannot be deleted.

**Service Definition Panel**

Once the service definition is created, it is available in the left-panel tree. Click it to open a new right panel that includes a **Services** tab and a **Service Summary** tab.

**Rename a Service Definition**

Once a service definition has been created and configured, you can change or modify its name.
To rename a service definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Expand **Service Definitions** in the left-panel.
4. Right-click the service definition you are renaming.
5. Click **Rename Service Definition**.
6. Enter a new name in the **Name** field.
7. Click **OK** to rename the service definition.

**Delete a Service Definition**

Once a service definition has been created and configured, you can delete it; however, a service definition or any of its associated service applications cannot be deleted once it has been assigned to a site.

To delete a service definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Expand **Service Definitions** in the left-panel.
4. Right-click the service definition you are deleting.
5. Click **Delete Service Definition**.
6. Click **Yes** to delete a service definition.

**Related Information**

For information on related topics:

- Services
- Fabric
- Sites
- Devices

**Services**

The **Services** tab displays virtual routing and forwarding functionality configured as part of a service application, the virtual local area networks defined for the service application, as well as all of the services included in a service application or all of the services included in a service definition, depending if you select a service application or a service definition in the left-panel, respectively.

The **Services** tab is included in the **Sites** tab.
The Services tab includes three tabs:

- **VRF Definition** – Create and configure VRF (Virtual Routing and Forwarding) definitions for the service application. VRFs allow for networking paths to be segmented without using multiple devices.
- **VLAN Definition** – Create and configure VLAN (Virtual Local Area Network) definitions for the service application.
- **Service Application Name** – Configure the L2 and L3 Virtual Services Networks (VSNs). The **Service Application Name** tab is divided into L2 VPN and L3 VSN tables.

### VRF Definition

The VRF Definition tab allows you to configure virtual routing and forwarding definitions included as part of the service.

#### Name

The name of the VRF definition.

#### VRF ID

The ID number assigned to the VRF definition.

### VLAN Definition

The VLAN Definition tab allows you to configure virtual local area network definitions included as part of the service.
Name
The name of the VLAN definition.

VID
The ID number assigned to the VLAN.

VRF ID
The ID number assigned to the VRF definition.

Multicast
Indicates the service sends IP packets to a group of hosts on the network.

IGMP Version
Indicates which version of IGMP is utilized on the port (Version 1 or Version 2).

IGMP Querier
The address of the IGMP Querier. This feature is used when there is no multicast router in the VLAN to originate the queries.

Querier Enable
Indicates whether an IGMP Query is enabled.

Virtual Routing
Displays the version of VRRP the default gateway is using:

- **NONE** – Virtual routing is not configured on the VLAN.
- **VRRPv2** – VRRP version 2 is configured on the virtual router. VRRP version 2 only supports IP addresses in IPv4 format.
- **VRRPv3** – VRRP version 3 is configured on the virtual router. VRRP version 3 supports IP addresses in both IPv4 and IPv6 formats.
**NOTE:** Virtual Routing is only supported on VSP devices.

**Virtual Routing Enable**
Indicates whether virtual routing is enabled for the VLAN.

**Virtual Routing Address**
The IP address for the virtual router. The Virtual Routing address must be in the same subnet as the VLAN subnet address.

**VRRP ID**
An identifier devices use to determine peer devices that participate in a virtual routing interface.

**VRRP Priority**
A value used by VRRP peers to determine the role of each of the devices in the VLAN. The default value is 100. The device with the largest value is assigned the role of Master. For example, in a VLAN with two routers, one with a **VRRP Priority** of 200 and one with a **VRRP Priority** of 100, the router with a **VRRP Priority** of 200 becomes the Master. In the event of identical priority numbers, the devices use the MAC address to determine priority.

**VRRP Backup Master**
This option determines if the backup router is able to forward traffic independently outside of the VLAN (enabled), or must forward the traffic to the Master router before it is forwarded outside of the VLAN (disabled).

**VRRP Advertisement Interval**
Indicates frequency (in seconds) that protocol packets are sent from the virtual router in the VLAN.

**VRRP Hold Down Timer**
Indicates the amount of time (in hundredths of a second) that the backup router waits for the primary router to respond before it becomes the primary router.

**Service Application Name**
The **Service Application Name** tab displays all of the services included in a service application or all of the services included in a service definition, depending if you select a service application or a service definition in the left-panel, respectively. The Services tab is included in the **Sites** tab.

Services are created within service applications. You can include multiple services within an application. Service applications are then included within service definitions.
You can also include multiple service applications within a service definition. A service definition that includes a complete set of services is then assigned to a site, which configures the fabric-enabled devices within that site.

The Services tab is only configurable when you select a service application. The services displayed when selecting a service definition are read-only.

**L2 VSN**

**Name**

The name of the Layer 2 service.

**Service ID**

The I-SID, which is the system-defined ID number assigned to the fabric service.

**Flex UNI**

Indicates that the fabric service is using the User-Network-Interface (UNI).

The following interface types are available:

- **Switched** – A VLAN-ID and a given port (VID, port) maps to a Layer 2 VSN I-SID. With this UNI type, VLAN-IDs can be reused on other ports and therefore mapped to different ISIDs.

- **Transparent** – A physical port maps to a Layer 2 VSN I-SID (all traffic through that port, 802.1Q tagged or untagged, ingress and egress is mapped to the I-
SID). Note: All VLANs on a Transparent Port UNI interface now share the same single MAC learning table of the Transparent Port UNI I-SID.

**VLAN**
The VLAN assigned to the fabric service.

**CVIDs**
Specifies the customer VLAN ID of the associated switched UNI port.

**Port Template**
Use the drop-down list to determine the purpose of the port:

- **Access** – Select this option if the port connects to user end-systems.
- **Interswitch** – You can also manually select this option if the port is used to connect to other switches. This option is selected by default if the port detects neighboring switches that are configurable.
- **Management** – Select this option if the port is used to manage network traffic with Extreme Management Center.
- **AP** – Select this option if the port is used to connect with a networking device that allows a Wi-Fi device to connect to a wired network.
- **Phone** – Select this option if the port is used to connect to a telephone.
- **Router** – Select this option if the port is used to connect to a router.
- **Printer** – Select this option if the port is used to connect to a printer.
- **Security** – Select this option if the port is used to connect to a device or devices that have been configured with security or advanced security settings.
- **IoT** – Select this option if the port is used to connect to an additional wireless "smart" device.
- **Other** – Select this option if the port is used to connect to any other device.

**DVR Enable**
Select to enable distributed virtual routing.

**IMPORTANT:** A device on which you enable DVR Leaf mode does not support all Extreme Management Center features. DVR Leaf mode is a constrained operating mode for the device and previous configurations defined on a device may no longer function properly.

**DVR Gateway**
Enter the gateway address of the DVR device.
Multicast Snooping
Select to configure the service to listen to Internet Group Management Protocol (IGMP) network traffic. The feature allows a network switch to listen in on the IGMP conversation between hosts and routers.

Multicast Routing
Select to configure the service to distribute data to multiple recipients. Using multicast, a source can send a single copy of data to a single multicast address, which is then distributed to an entire group of recipients.

IGMP Version
The version of IGMP the service is using: Version 1, 2, or 3.

IGMP Querier
Enter the address of the IGMP Querier. Use this feature when there is no multicast router in the VLAN to originate the queries.

L3 VSN

Name
The name of the Layer 3 service.

Service ID
The I-SID, which is the system-defined ID number assigned to the service.

VRF
Select the virtual routing and forwarding definition included as part of the service.

Multicast
Select to indicate that the service sends IP packets to a group of hosts on the network.

Unicast
Select to indicate that the service sends IP packets to a single recipient on the network.

Direct Route
Select to indicate that the service sends IP packets directly to another device without going through a third device.

Related Information
For information on related topics:
- Service Summary
- Fabric
- Sites
Fabric

Extreme Management Center's Fabric technology allows you to manage your domains seamlessly and interdependently across both physical and virtual servers, storage, and networks. Fabric technology is designed to be highly efficient, flexible enough to adapt to your network's varying traffic volume, and easily maintained with minimal intervention. You can provision Fabric functionality on the Sites tab in Extreme Management Center.

For additional information about Fabric functionality, see the Configuring Fabric Basics and Layer 2 Services on VSP Operating System Software VSP 8600 guide for the latest VSP 8600 release.

Extreme Management Center's fabric solution consists of two major components:

- Fabric Manager – A virtual engine that provides Extreme Management Center with fabric topology information and allows you to configure fabric functionality on your fabric-enabled devices.
- Fabric Tab – The tab within Extreme Management Center that allows you to view and configure the fabric functionality on your devices.

**NOTE:** The Fabric Manager engine must be installed and running on your network for the Fabric tab in Extreme Management Center to receive and display fabric topology information.

Once the Fabric Manager engine is running in Extreme Management Center, the Fabric tab on the Devices tab displays information about the fabric topologies currently configured on your devices.

**NOTES:** The following device types support fabric functionality:

ERS35xx with firmware version 5.3.7 and later, ERS36xx with firmware version 6.2.0 and later, ERS48xx with firmware version 5.12.0 and later, ERS49xx with firmware version 7.6.0 and later, ERS59xx with firmware version 7.6.0 and later, VSP7024 with firmware version 10.4.6 and later, VSP4xxx with firmware version 6.1.3 and later, VSP7xxx with firmware version 6.1.3 and later, VSP8xxx with firmware version 6.1.3 and later

For minimum requirements, see Extreme Management Center Configuration and Requirements.
Accessing Fabric in Extreme Management Center

After adding the Fabric Manager engine in Extreme Management Center, view the fabric topologies configured on your devices on the Fabric tab.

To access the Fabric tab:

1. Open the Devices tab.
2. Select Sites from the left-panel drop-down list.
3. Right-click a site in the left-panel tree.
4. Select View > Fabric from the menu.

The Fabric tab opens.
Fabric Tab

The Fabric tab includes three sub-tabs:

- **Fabric Connect** – Displays the fabric topologies configured on your fabric-enabled devices.
- **Fabric Extend** – Allows you to extend fabric functionality to include Layer 2 and Layer 3 core networks.
- **VXLAN** – Allows you to configure a Virtual Extensible LAN (VXLAN) to tunnel Layer 2 traffic over a Layer 3 network in the fabric topologies you configure.
Related Information

For information on related topics:

- Services
- Service Summary
- Fabric Connect
- Fabric Assist
- Sites
- Devices
Fabric Connect

Extreme Management Center’s Fabric Connect within the Fabric Manager engine displays your network’s fabric technology and extended fabric functionality. Fabric Connect uses Fabric Topology templates that allow you to view and to configure SPBm (Shortest Path Bridging), based L2 and L3 Virtual Services Networks (VSNs), as well as IP-shortcut based VSNs. The Fabric Attach extends Fabric technology functionality to network elements or hosts that are not SPB-capable.

The Fabric Connect tab allows you to view and configure topologies with the fabric-enabled sites in your network. Select the Toggle View button to display fabric services for individual devices.

NOTE: Fabric Connect uses Fabric Topology templates that define the topologies, services and service applications that comprise the Fabric Topology. Create the topology and service definitions via the Sites tab before you assign the Fabric Connect Topology to a site and access the Fabric Connect tab.

The Fabric Connect tab is divided into two sections: the left-panel tree view and a Fabric Topology right-panel map view.
Left-Panel Tree

Beginning in version 8.5, Extreme Management Center supports two Fabric technology infrastructures: Fabric Connect and Fabric Attach (FA). The left-panel tree includes Fabric Connect and Fabric Attach folders that expand to display all fabric services you have configured in your network.

Fabric Connect Folder

Select the Fabric Connect tab to display the fabric topologies configured on the devices in the site.

Select a service in the Fabric Connect folder to open a fabric topology map and a service name tab in the right panel. The map displays the devices enabled with the services you selected and the service name tab displays a table with details about that service.
Select the **Toggle View** button to display Fabric Connect fabric services for individual devices.

**Fabric Attach Folder**

The Fabric Attach (FA) extends Fabric technology functionality to network devices that are not SPB-capable. The Fabric Attach tab displays global, server and proxy capable services for your network and devices.

**NOTE:** You can enable Fabric Attach on the following switches:

- **FA Server** – for VOSS, ERS 49xx v5.9.2 and later, ERS 4850 v5.9.2 and later, and ERS 59xx series devices;
- **FA Proxy (client proxy)** – for ERS 35xx, ERS 48xx, ERS 49xx, ERS 55xx, ERS 56xx, ERS 59xx, and VSP 70xx series devices;
Select a service in the Fabric Attach folder to open a fabric topology map and a VSN tab in the right panel. The map displays the devices enabled with the service you selected and the VSN Home tab displays a table with details about the VSNs enabled on the site. Select the **Toggle View** button to display Fabric Attach services for individual devices.

**Right-Panel Topology Map**

The Fabric Topology panel includes the **Fabric Topology** tab that displays a topology map of the fabric-enabled sites or devices in your network. You can use the topology map to gain a high-level view of your network, or to view detailed information about devices and links in the topology. Drag your device icons in the topology map to rearrange the map. Additionally, you can modify and save your map layouts in the Fabric Topology tab.

**Topology Tab Tools**

The Fabric Topology tab includes the following tools:

**Fabric Service**

Lists fabric services in your network. Select a service from the drop-down list to display it in the topology map.
Right-Panel Topology Map

Hide/Show Ports
Use to hide or display fabric enabled ports in your network.

Clear Highlights
Use to clear existing highlights on the topology map.

Save Topology
Use to save your topology map.

Clear Topology
Use to remove the devices in your topology map.

Color Legend
The types of fabric services are coded by colors in the topology map.

Topology Tab Buttons
The Fabric Topology tab also includes the following buttons that allow you to further manipulate the fabric service and topology data:

Sync From Site
Use to copy the fabric service configuration for the site to all the devices in the map.

Toggle View
Select to display fabric topology, services and tables for individual devices.

Re-draw Topology
Select to display an alternate topology arrangement.

Help
Select to access Extreme Management Center help.

Related Information
For information on related topics:

- Services
- Service Summary
- Sites
- Devices
- Fabric Assist
Fabric Manager ZTP+ Configuration

Fabric Manager is a resilient, scalable, and highly efficient network management application that allows your network domains to operate interdependently, efficiently, and with minimal intervention. Fabric Manager allows you to monitor the fabric topology and service applications on your network.

Fabric Manager is deployed as a separate virtual machine (VM) in Extreme Management Center, and is enabled via ZTP+ (Zero Touch Provisioning Plus) functionality.

General Network Configuration

Fabric Manager supports two initial configuration modes for Extreme Management Center discovery and registration: DHCP mode and Static mode. DHCP is the default configuration mode.

Use the Static mode when providing a predefined set of networking configurations.

Use the DHCP mode so the engine can communicate with the Extreme Management Center server. The following DHCP settings and DNS mapping of `extremecontrol` are for when Fabric Manager is installed in DHCP Mode:

- The DHCP Server needs to return a DNS Server and Domain Name to the ZTP+ device. It is the default mode of configuration during the Fabric Manager VM's initial bootup cycle.
- The DNS Server needs to map the name `extremecontrol.<domain-name>` to the IP address of the Extreme Management Center server.

Once Extreme Management Center and the ZTP+ device are pre-configured, you can add the site definition to the Extreme Management Center database. For information, see How to Add Fabric Manager.

Related Information

For information on related topics:

- Sites
- Profiles
- Add Device
How to Create a Service Application

You can create a service application via the Sites tab in Extreme Management Center. Service definitions display information from service applications. Once created, service applications are added to sites in your network and are used to build a topology map.

Create a Service Application

To create a service application:

1. Access the Devices tab.
2. Select Sites from the left-panel drop-down list.
3. Expand Service Definitions in the left-panel.
4. Right-click the service definition in which you want to create the service application.
5. Click Create Service Application.

The Create Service Application window opens.
6. Enter a name in the Name field.
7. Click OK.
8. Click the newly created service application.
9. Use the Services tab and a Service Summary tab to configure the service application.
The service application is created. Once the service application is created and configured, you can apply it to a site within your network. Once services have been assigned to a site, they cannot be deleted.

**NOTE:** A Service Application must have the same fabric type as its associated Service Definition. For example, if a Service Definition is created with Fabric Connect type, it can only have Service Applications of Fabric Connect type. Currently, Fabric Connect is the only fabric type available.

Once the service application is created, it is available in the left-panel tree and a new right panel opens that includes a Services tab and a Service Summary tab.

### Rename a Service Application

To change the name of a service application:

1. Open the Devices tab.
2. Select Sites from the left-panel tree drop-down list.
3. Expand Service Definitions in the left-panel.
4. Right-click the service application you are renaming.
5. Click Rename Service Application.
6. Enter a new name in the Name field.
7. Click OK to change the name of the service application.

### Delete a Service Application

You can delete all user-defined service applications, unless the service application or any of its associated service definitions are assigned to a site.

To delete a service application:
1. Open the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Expand **Service Definitions** in the left-panel.
4. Right-click the service application you are deleting.
5. Click **Delete Service Application**.
6. Click **Yes** to delete the service application.

### Related Information

For information on related topics:

- **Services**
- **Fabric**
- **Sites**
- **Devices**

### How to Add Fabric Manager

Once you install the Fabric Manager virtual machine (VM), you can add it to Extreme Management Center and enable it via ZTP+ (Zero Touch Provisioning Plus) functionality.

#### Adding Fabric Manager to Extreme Management Center

Prior to adding the Fabric Manager engine, you must create an Administration Profile for the Fabric Manager with CLI credentials. Fabric Manager uses the Administrator Profile as an additional user account.

#### Add CLI Credentials

1. Launch Extreme Management Center.
2. Open the **Administration > Profiles** tab.
3. In the bottom panel, click the **CLI Credentials** tab.
4. Click the **Add** button ( ![Add](add_symbol.png)) to open the **Add CLI Credential** window.

5. Enter a name for the CLI Credential in the **Description** field.

6. Enter **root** in the **User Name** field.

7. Select **SSH** from the **Type** drop-down list.

8. Enter a password in the **Login Password** field.
   This password must be the same password that you provided in Step 2b of the Fabric Manager Installation Static Mode topic.

9. Enter a password in the **Enable Password** field.

10. Enter a password in the **Configuration Password** field.

11. Click **Save**.

**Create Administration Profile**

1. At the top of the **Profiles** tab, select the **Add** button ( ![Add](add_symbol.png)) to open the **Add Profile** window.
2. In the **Profile Name** field, enter a name for this profile.

3. In the **SNMP Version** field, select **SNMPv1**. Fabric Manager does not use SNMP; the SNMP credentials here are just placeholders.

4. In the **Read** field, select **Ping Only**.

5. In the **Write** field, select either **No Access** or **Ping Only**.

6. In the **CLI Credential** field, select the same CLI Credential that you created in Step 4 of the Add CLI Credentials topic.

7. Select **Save**.

### Add Administration Profile to the Fabric Manager engine

1. Open the **Network > Discovered** tab in Extreme Management Center.

   **NOTE:** The Fabric Manager appears as a device on the Discovered tab. It is listed with a **Status** of ZTP+ Pending Edit, indicating the configuration needs to be edited before adding it to the Extreme Management Center server.

2. Right-click the new Fabric Manager file and select **Configure Devices** tab from the drop-down list.

   The **Configure Device** window opens.
3. Select the profile you created from the Administration Profile drop-down list.

4. Select ZTP+ from the Poll Type drop-down list.

5. Click the ZTP+ Device Settings tab in the Configure Device window.

6. Configure the fields on the ZTP+ Device Settings tab to determine how the Fabric Manager is managed by Extreme Management Center using ZTP+ functionality.

### ZTP+ Discovery

Once the ZTP+ discovery process is complete, the Fabric Manager engine is added to the Extreme Management Center database and moves from the Network > Discovered tab to the Network > Devices tab. The ZTP+ discovery process may take up to five minutes to complete.

**NOTES:** If you did not select Automatically Add Devices on the Site tab, the Fabric Manager engine remains on the Discovered tab with a Status of ZTP+ Complete. Select the file, click the Add Devices button (the Add Device window appears), and click the Add button to add the device to the Extreme Management Center database.

In the event a configuration is not correctly transmitted to the switch or if connectivity is lost during any part of this process, the file resets and allows the process to restart.

The Fabric Manager engine Status (displayed on the Discovered tab) is now ZTP+ Staged, indicating Extreme Management Center will push the configuration to the device the next time the device contacts Extreme Management Center.
Applying Fabric Services

When Extreme Management Center pushes the configuration to the Fabric Manager engine, the **Status** is **ZTP+ Complete**.

Related Information

- Extreme Management Center Fabric
- Fabric Connect

Applying Fabric Services

Once you have created and configured your fabric topology, service and service application services, you can apply them to sites within your network. Once fabric topology and services have been assigned to a site, they cannot be deleted.

**NOTE:** Services not assigned to a service definition (where NONE has been selected) can be deleted from a site after they have been assigned to that site.

Applying a Fabric Topology to a Site

1. Open the **Network > Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Click a site in the left-panel tree.
4. Click the site name tab in the **Devices** sub-tab.
5. Click the **Topologies** tab.
6. Select the topology you want to apply to the site from the **Topology Definition** drop-down list.
7. Select the DVR Domain from the **DVR Domain** drop-down list.
8. Click the checkboxes in the **Features** section to include the features you want to assign to the topology.
9. Click **Save**.

**NOTE:** Only one Fabric Topology and one DVR Domain can be assigned a site in Extreme Management Center.

### Applying a Service Application to a Site

1. Open the **Network > Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Click a site in the left-panel tree.
4. Click the site name tab in the **Devices** sub-tab.
5. Click the **Services** tab.
6. Select the service definition you want to apply to the site from the **Service Definition** drop-down list. The service application details that you configured to the service definition display in the L2 VPN and L3 VPN tables.
7. Click **Save** to apply the services to the site.
Applying Fabric to Port Templates

The Port Templates Configuration window enables you to configure ports with a Fabric role. Once complete, you can apply the Port Templates configuration to a device.

Extreme Management Center supports the following Fabric roles:

- None
- NNI
- Fabric Attach
- Switched UNI
- Transparent UNI
- Fabric Attach and Switched UNI

**NOTE:** The Fabric Attach (FA) and Switched UNI (S-UNI) option means that the port is configured for both features, but only one feature is active at any one time. The mode is determined by which mapping request the port receives first (FA or S-UNI). Ports receive mapping requests via LLDP TLVs.

The following screen capture shows the Port Templates window, which you can access from either the World view or from a specific Site.

Use the following steps to configure a port template:
1. Open the **Network > Devices** tab.
2. Select **World** or a specific Site, and then the **Port Templates** tab.
3. Select a template, and then the **Edit (Edit)** button.
5. Under **Fabric Auth Type**, select an authentication type.
6. Under **Fabric Auth Key**, select an authentication key if available.
7. Select **Save**

**Applying Fabric to Ports**

The Port Configuration window enables you to edit the fabric information about the ports on a device.

Extreme Management Center supports the following Fabric roles:

- None
- NNI
- Fabric Attach
- Switched UNI
- Transparent UNI
- Fabric Attach and Switched UNI

**NOTE:** The Fabric Attach (FA) and Switched UNI (S-UNI) option means that the port is configured for both features, but only one feature is active at any one time. The mode is determined by which mapping request the port receives first (FA or S-UNI). Ports receive mapping requests via LLDP TLVs.

The following screen capture shows the Port Templates window, which you can access from either the World view or from a specific Site.
Use the following steps to configure a port template:

1. Open the Network > Devices tab.
2. Select Devices.
3. Select the Menu icon (≡) or right-click on a device.
4. Select Configure.
   The Configure Device window opens.
5. Select Ports.
6. Select a port, and then the Edit (Edit) button.
8. Under Fabric Auth Type, select an authentication type.
9. Under Fabric Auth Key, select an authentication key if available.
10. Select Save.
Applying Fabric Services to a Device

Once you have applied fabric topologies and services to a site, you can also apply the fabric services to devices assigned to that site.

Applying Fabric Topology to a Device

1. Open the Network > Devices tab.
2. Select Sites from the left-panel tree drop-down list.
3. Right-click a site in the left-panel tree.
4. Click Configure Device from the drop-down list. The Configure Device window opens.
5. Click the Fabric Topologies tab.
6. Click the Sync from Site button to populate the tab with the fabric topology details you applied to the site. The topology details you applied to the site will be applied to the device, as long as the device you have selected is assigned to the same site.
7. To populate the tab manually, click the Enable Fabric checkbox.
8. Select a Fabric Role from the drop-down list.
9. Enter a system ID number in the System ID field.
10. Enter a nickname in the SPBM Nickname field.
11. Check the Multicast checkbox, if needed.
12. Check the IP Shortcuts checkbox, if needed.
13. Enter the system name in the System Name field.
14. Click the Enforce Preview button.

Applying Fabric Services to a Device

1. Open the Network > Devices tab.
2. Select Sites from the left-panel tree drop-down list.
3. Right-click a site in the left-panel tree.
4. Click Configure Device from the drop-down list. The Configure Device window opens.
5. Click the **Services** tab. The service details that you configured to the site display in the L2 VPN and L3 VPN tables.

6. Click the **Sync from Site** button to populate the tab with the fabric service details you applied to the site. The service details you applied to the site will be applied to the device, as long as the device you have selected is assigned to the same site.

7. Click the Add (Add) button to add an L2 VSN or L3 VSN service to the device.

8. Click the Edit (Edit) button to edit service details that were populated from the site.

9. Click the **Enforce Preview** button.

**NOTE:** The L3VPN table is disabled when the device is set as a DVR Leaf node.

**Adding and Deleting VRF Definitions**

1. Open the **Network > Devices** tab.

2. Select **Sites** from the left-panel tree drop-down list.

3. Right-click a site in the left-panel tree.

4. Click **Configure Device** from the drop-down list. The **Configure Device** window opens.

5. Click the **VRF Definition** tab.
The VRF Definition tab in the Configure Device window displays read-only VRF details you applied to the site. You can add a new VRF to the device.

1. Click the Add (Add) button.
2. Enter the name of a VRF in the Name field.
3. Enter the ID number in the VRF ID field.
4. Click Update to add the VRF to the device.
5. Click the Enforce Preview button.

You can delete a VRF from the VRF Definition tab.

1. Select a VRF in the table.
2. Click the Delete (Delete) button.
3. Click Yes to remove the VRF.

Adding and Deleting VLAN Definitions

1. Open the Network > Devices tab.
2. Select Sites from the left-panel tree drop-down list.
3. Right-click a site in the left-panel tree.
4. Click **Configure Device** from the drop-down list. The **Configure Device** window opens.

5. Click the **VLAN Definition** tab.

![Configure Device Window](image)

The **VLAN Definition** tab in the Configure Device window displays read-only VLAN details you applied to the site. You can add a new VLAN to the device.

1. Click the **Add** button.
2. Enter the name of a VLAN in the **Name** field.
3. Enter the ID number in the **VLAN ID** field.
4. Click **Update** to add the VLAN to the device.
5. Click the **Enforce Preview** button.

You can delete a VLAN from the **VLAN Definition** tab.

1. Select a VLAN in the table.
2. Click the **Delete** button.
3. Click **Yes** to remove the VLAN.

**Enforcing the Fabric Configurations**

Once you enforce previews on the **Topologies**, **Services**, and **VRF Definitions** tabs, use the **Compare Device Configuration** window to enforce the configurations to the device.
Additionally, the **VLAN Definition** tab allows you to enforce the **VLAN** and **Ports** fabric configurations.

### Enforcing Fabric Topology

1. Click **Enforce Preview** on the **Topologies** tab in the **Configure Device** window.
2. The **Compare Device** window opens.

![Image of Configure Device window](image)

3. Click the Topologies Enforce Option.
4. Click **Enforce**.

### Enforcing Fabric VRF

1. Click **Enforce Preview** on the **VRF** tab in the **Configure Device** window.
2. The **Compare Device** window opens.

![Image of Configure Device window](image)
3. Click the VRF Definition tab.
4. Click Enforce.

Enforcing Fabric Services

1. Click Enforce Preview on the Services tab in the Configure Device window.
2. The Compare Device window opens.

3. Click the Services Enforce Option.
4. Click the L2 VPN tab.
5. Click Enforce.
6. Click the L3 VPN tab.
7. Click Enforce.

Enforcing Fabric VLAN

1. Click Enforce Preview on the VLAN tab in the Configure Device window.
2. The **Compare Device** window opens.

![Compare Device window](image1)

3. Click the VLAN Definition Enforce Option.
4. Click **Enforce**.

**Enforcing Fabric Port**

1. Click **Enforce Preview** on the **Ports** tab in the **Configure Device** window.
2. The **Compare Device** window opens.

![Configure Device window](image2)

3. Click the Ports Enforce Option.
4. Click **Enforce**.
Related Information

- Services
- Fabric
- Sites
- Devices

**Service Summary**

The Service Summary tab displays a summary of the fabric services you create and the sites to which they are assigned.

<table>
<thead>
<tr>
<th>Path</th>
<th>Name</th>
<th>Service ID</th>
<th>VRF</th>
<th>VLAN</th>
<th>Sites</th>
</tr>
</thead>
</table>

**Path**

The path to the Service Application in which the service is located.

**Name**

The name of the fabric service included in the service application or definition.

**Service ID**

The I-SID, which is the system-defined ID number assigned to the service.

**VRF**

The ID number assigned to the VRF definition.

**VLAN**

The ID number assigned to the VLAN.

**Sites**

The site to which the fabric service is assigned.

**Related Information**

For information on related topics:

- Services
- Fabric
How to Create a Fabric Topology Definition

You can create a Topology Definition and a LAG (link aggregation group) Topology Definition on the Sites tab in Extreme Management Center. Once you create topology definitions, you can add them to sites in your network to build a fabric topology map.

Create a Topology Definition

To create a topology definition:

1. Access the Devices tab.
2. Select Sites from the left-panel drop-down list.
3. Navigate to Topology Definitions in the left-panel tree.
4. Right-click Topology Definitions.
5. Click Create Topology Definition.

The Create Topology Definition window opens.

6. Enter a name in the Name field.
7. Select Fabric Connect from the Fabric Type drop-down.
8. Click OK to create the topology definition.

Configure a Topology Definition

Once the topology definition is created, it is available in the Sites tab left-panel tree. Click it to open a new right panel that includes the Fabric Name tab and a Fabric Summary tab.
Fabric Name Tab

Use the **Fabric Name** tab to configure the topology definition.

To configure the topology definition:

2. Enter the Primary Backbone VLAN (BVLAN).
3. Enter the **Secondary BVLAN**.
4. Click the **Add** button in the DVR Interface Settings section.
5. Enter a DVR Domain name in the **Name** Field.
6. Enter an ID number in the **Domain ID** field.
7. Click **Update**.
8. Click **Save**

Once the topology definition is created and configured, you can apply it to a site within your network. Once fabric topologies have been assigned to a site, they cannot be deleted.

**Fabric Summary tab**

The Fabric Summary tab lists any fabric topologies you have created and the sites to which they are assigned.
Rename a Topology Definition

Once a topology definition has been created and configured, you can change or modify its name.

To rename a topology definition:

1. Open the Devices tab.
2. Select Sites from the left-panel tree drop-down list.
3. Expand Topology Definitions in the left-panel.
4. Right-click the topology definition you are renaming.
5. Click Rename Topology Definition.
6. Enter a new name in the Name field.
7. Click OK to change the topology name.

Delete a Topology Definition

Once a topology definition has been created and configured, you can delete it; however, a topology definition cannot be deleted once it has been assigned to a site.

To delete a topology definition:
1. Open the **Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Expand the **Topology Definitions** in the left-panel.
4. Right-click the topology definition you are deleting.

5. Click **Delete Topology Definition**.
6. Click **Yes** to delete the topology definition you selected.

---

**Related Information**

For information on related topics:

- **Services**
- **Fabric**
- **Sites**
- **Devices**

---

**How to Create a Fabric Service Definition**

You can create a service definition in the **Sites tab** in Extreme Management Center. Service definitions display information configured in service applications definitions.
Once created, service definitions are added to sites in your network and are used to build a fabric topology map.

**Create a Service Definition**

To create a service definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Select **Service Definitions** in the left-panel.
4. Right-click **Service Definitions**.
5. Click **Create Service Definition**.

![](image)

The **Create Service Definition** window opens.

6. Enter a name in the **Name** field.
7. Select **Fabric Connect** from the **Type** drop-down list.
8. Click **OK** to create the service definition.

Once the service definition is created and configured, you can **apply** it to a site within your network. Once fabric services have been assigned to a site, they cannot be deleted.

**Service Definition Panel**

Once the service definition is created, it is available in the left-panel tree. Click it to open a new right panel that includes a **Services** tab and a **Service Summary** tab.

**Rename a Service Definition**

Once a service definition has been created and configured, you can change or modify its name.
To rename a service definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Expand **Service Definitions** in the left-panel.
4. Right-click the service definition you are renaming.
5. Click **Rename Service Definition**.
6. Enter a new name in the **Name** field.
7. Click **OK** to rename the service definition.

**Delete a Service Definition**

Once a service definition has been created and configured, you can delete it; however, a service definition or any of its associated service applications cannot be deleted once it has been assigned to a site.

To delete a service definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Expand **Service Definitions** in the left-panel.
4. Right-click the service definition you are deleting.
5. Click **Delete Service Definition**.
6. Click **Yes** to delete a service definition.

**Related Information**

For information on related topics:

- Services
- Fabric
- Sites
- Devices

**Upgrading Fabric Manager**

Use the following procedure to upgrade your version Fabric Manager.

**Prerequisites**

- Upgrade Extreme Management Center to the later version before you upgrade Fabric Manager to the corresponding build number.
- Ensure that both the current and target Extreme Management Center and Fabric Manager build numbers are the same.
- Download the latest upgrade bundle from the Extreme Networks software download Portal.
- Change **Login Information** from **Anonymous** to appropriate SCP credentials in the SCP Server Properties section in the **Administration > Options > Inventory Manager > File Transfer** tab.

**NOTE:** After you deploy Fabric Manager and then register with Extreme Management Center, only the user credential associated with the Fabric Manager profile has SSH login access.

**Upgrade Procedure**

1. Open the **Network** tab in Extreme Management Center.
2. Click the **Firmware** tab.

3. On the left panel, click **Upload**.

4. In the Directory field, select the **SCP** radio button and click **Upload**.

5. Click on **Drop files here or click to browse** and select the previously downloaded upgrade bundle.

6. Click the **Upload** button to initiate the bundle upload to the Extreme Management Center server.
   Once the upload is completed successfully, if not previously added after clicking on the **Refresh** button, a new entry appears under Device Type called Fabric Manager.
7. Navigate through the newly added Device type until you see the bundle image listed.

8. Right click on the bundle listed on the main panel and click on Set as Reference Image.

This step sets this image bundle as the Reference upgrade image for Fabric Manager. The upgrade process to get triggered by default can take up to five minutes depending on the poll interval set on Extreme Management Center.

9. Open the Operations log on Extreme Management Center and wait until a log of type ‘ZTP+’ with the message Successfully upgraded FabricMgr_appliance_upgrade_bundle_<version_number>.zip appears.

This is followed by a message Finished without error to indicate the upgrade operation has been completed by the ZTP+.
10. When the upgrade is complete, the details on Fabric Manager are updated to the latest version.

Post Upgrade Steps

1. Ensure that the same user credential associated with the Fabric Manager profile has SSH login access.

2. Navigate to the previously added and referenced upgrade image and un-reference it by right clicking on the bundle and then clicking Unset as Reference Image.

Related Information

- Extreme Management Center Fabric
- Fabric Connect
## Troubleshooting

This troubleshooting guide provides a list of items to check when Extreme Management Center functionality is failing to perform correctly. Locate a problem in the left column and then review the troubleshooting information in the right column.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Troubleshooting Steps</th>
</tr>
</thead>
</table>
| **Error contacting a wireless controller.** The controller shows a Warning icon. | 1. Verify that the Configuration password in the CLI Credential used for this device is properly configured.  
   a. From Extreme Management Center, access **Administration > Profiles** tab.  
   b. Select the **CLI Credentials** subtab.  
   c. Select the CLI Credential being used by the controller's Profile, and click **Edit**.  
   d. Verify the user name and password used in the credential. For wireless controllers, add the Login password to the Configuration password field instead of the Login password field. The username and Configuration password specified here must match the username and Login password configured on the controller.  
   e. Verify the SSH connection type is selected.  
   f. Click **OK**.  
   g. Use this CLI Credential in the controller's Profile.  

   **NOTE:** When configuring profiles for ExtremeWireless Controllers, you must ensure that controllers are discovered using an SNMPv2c or SNMPv3 profile. The profile must also contain SSH CLI credentials for the controller. Wireless Manager uses the controller's CLI to retrieve required information and to configure managed controllers. |
| 2. Verify that the following ports are accessible through firewalls for the Extreme Management Center Server and Wireless Controllers to communicate:  
  SSH: 22  
  SNMP: 161, 162  
  Langley: 20506 |