Deploying the BIG-IP LTM with the Cacti Open Source Network Monitoring System

Version 1.0
Deploying F5 with Cacti Open Source Network Monitoring System

Welcome to the F5 and Cacti deployment guide. This guide provides detailed procedures for configuring F5 devices with the Cacti Open Source Network Monitoring System.

Network Management Systems (NMS) provide insight to device and application performance, system stability, network trouble spots and a host of other items that affect a company's ability to provide computer network services. Recent advances in automated event correlation, data storage and retrieval, as well as open source systems that allow greater integration, have greatly improved today's Network Management Systems.

Cacti is a complete network graphing solution designed to harness the power of RRDTool's data storage and graphing functionality. Cacti provides a fast poller, advanced graph templating, multiple data acquisition methods, and user management features out of the box. All of this is wrapped in an intuitive, easy to use interface that makes sense for LAN-sized installations up to complex networks with hundreds of devices.

For more information on the Cacti project, see http://www.cacti.net/.

For further Cacti resources and information, see http://cactiez.cactiusers.org/.

For more information on F5 devices described in this guide, see http://www.f5.com/products/big-ip/.

To provide feedback on this deployment guide or other F5 solution documents, contact us at solutionsfeedback@f5.com.

Prerequisites and configuration notes

The following are prerequisites and configuration notes about this deployment:

- The BIG-IP LTM system must be running v9.0 or later. We highly recommend using v9.4 or later. Examples shown in this document are from a v10.0 system.

- While many versions of Cacti exist, examples shown in this document are from a CactiEZ v0.8.7c deployment. As with many open source projects, development is ongoing and Cacti v0.8.7d was recently released. There have been no changes to the user interface between releases that would affect information contained in this guide.

- This document is written with the assumption that the reader is familiar with BIG-IP LTM systems, open source tools, Linux server systems administration and the Cacti monitoring platform.

- Additionally, the system administrator should be familiar with the basic concepts of the Simple Network Management Protocol (SNMP). For more information on configuring these products, consult the appropriate documentation.
Product versions and revision history

Product and versions tested for this deployment guide:

<table>
<thead>
<tr>
<th>Product Tested</th>
<th>Version Tested</th>
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<tbody>
<tr>
<td>BIG-IP Local Traffic Manager (LTM)</td>
<td>v10.0</td>
</tr>
<tr>
<td>Cacti Network Graphing Solution</td>
<td>v0.8.7c</td>
</tr>
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<td>SNMP</td>
<td>v2c</td>
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Revision history:

<table>
<thead>
<tr>
<th>Document Version</th>
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<tbody>
<tr>
<td>1.0</td>
<td>New deployment guide</td>
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Configuration example

The BIG-IP LTM system is used to add high availability and traffic management to a pool of servers providing network services and enterprise applications such as web (HTTP) traffic. Many network administrators deploy management solutions on a dedicated network to monitor and managed their hardware. A typical deployment of a monitored BIG-IP LTM is shown in the following illustration.

![Logical configuration example](image)

*Figure 1  Logical configuration example*
Configuring the BIG-IP LTM for monitoring with the Cacti Network Graphing Solution

This deployment guide is divided into the following sections:

• Performing the initial configuration tasks, on page 3
• Importing existing Cacti templates, on page 7
• Adding the F5 devices to the Cacti configuration, on page 10
• Configuring the Cacti Monitoring Server to display monitored data collected from the BIG-IP LTM, on page 13

We recommend you save your existing BIG-IP configuration before you begin the procedures in this Deployment Guide. For information on backing up or restoring a BIG-IP LTM configuration, refer to the BIG-IP LTM manual appropriate to your version, available on Ask F5.

Performing the initial configuration tasks

In this section, we configure the BIG-IP LTM with the required SNMP settings to allow communication from the Cacti monitoring server. This section contains the following procedures:

• Configuring SNMP, on this page
• Configuring the community name strings, on page 4

Configuring SNMP

The first procedure in this deployment is allow the BIG-IP LTM system to accept requests and reply with data to specific SNMP requests from the monitoring system.

To allow SNMP Communication

1. On the Main tab, expand System, and then click SNMP. The SNMP configuration screen opens.
2. In the Contact Information box, type the name of the person who administers the SNMP service for this system. In our example, we type BIG-IP System Administrator.
3. In the Machine Location box, type the location of this device. In our example, we type East Coast Data Center.
4. From the Client Allow List section, in the Address box, type the address of your Cacti server, and then click the Add button.
**Note:** You may want to enter the entire monitoring network IP address range in this step. This is useful if you have additional monitoring systems on the management network that are also monitoring the BIG-IP LTM. To provide a more secure environment the administrator may wish to add only individual IP addresses. Examples of both conditions are shown in Figure 2.

5. Click the **Update** button.

![System - SNMP](image)

**Figure 2** Configuring SNMP information on the BIG-IP LTM

**Configuring the community name strings**

Next, we need to set the community name strings to allow the SNMP agent on the BIG-IP LTM to communicate with the Cacti server. The community name strings are essentially passwords used to authenticate an SNMP **Get** request.

**To configure the community name strings**

1. On the Main tab, expand **System**, and then click **SNMP**. The SNMP configuration screen opens.
2. From the Menu bar, point your mouse at **Agent**, and then click **Access (v1, v2c)**.
3. Click the **Create** button. The New Access Record page opens.
4. In the **Community** box, type a name for the community. In our example, we type **private**.

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Archived
5. In the **Source** box, type the IP address of the Cacti monitoring server. In our example, we type **10.10.50.136**.

6. In the **OID** box, type the start of the object identifier (OID) you want to monitor. You must at least type `.1` in this box (which is the first portion of any OID string).

7. From the Access list, select the appropriate access level. In our example, we select **Read Only**.

8. Click the **Finished** button.

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**Figure 3 Creating a new access record**

This concludes the initial configuration tasks.
Manually creating Cacti templates for the BIG-IP system

The Cacti platform uses a series of templates to build sets of data collections and graphs that are specific to a network device type. Creating monitoring templates allows system administrators to collect the same data across several similar devices. Additionally, when a new device is deployed in the managed environment, an existing template can be applied to monitor that device. There are three types of templates that are used to populate the data tables; Data Templates, Graph Templates and Host Templates. The information the templates collect is used for monitoring thresholds, and graphing.

You can either manually create the templates, or import existing templates (see the following section). It is outside the scope of this document to reproduce the Cacti documentation for manually creating Cacti templates. For specific information on creating Cacti templates, see Chapter 13, Templates, in The Cacti Manual (http://www.cacti.net/downloads/docs/html/templates.html). You can also visit the Cacti forums, where users contribute additional templates and make them available for download.

If you decide to manually create Cacti templates for the BIG-IP system, BIG-IP version 10.0 and later offers a dashboard view of various performance metrics. You can use these metrics for a number of purposes including observing system performance, monitoring throughput, capacity planning, or troubleshooting network problems. To replicate the collected dashboard data in your Cacti system, you can use the BIG-IP OIDs when creating new templates for your environment. See the Collecting Performance Data section in Chapter 17, Configuring SNMP of the TMOS Management Guide for BIG-IP Systems, available on Ask F5 (For versions 10.0 and 10.0.1: https://support.f5.com/kb/en-us/products/big-ip_ltm/manuals/product/tmos_management_guide_10_0_0/tmos_snmp.html#1042852).
Importing existing Cacti templates

As mentioned in the previous section, the Cacti user community provides a number of monitoring templates. Templates for basic SNMP monitoring of a number of devices can be found on the Cacti web site. The templates for F5 devices can be found on F5’s DevCentral site.

Appendix A: F5 MIB, on page 15 includes information about the F5 MIBs.

To Import a template on the Cacti Server

1. Download and unzip the F5 template file to a temp directory on the Cacti device (such as `/var/tmp`). The template is located at http://devcentral.f5.com/wiki/default.aspx/AdvDesignConfig/CactiF5HostTemplate.html.

2. Copy the files that support the BIG-IP template, using the following commands:
   ```
   cp f5_*.xml /var/www/html/resource/snmp_queries
   cp f5_*.pl /var/www/html/scripts/
   ```

3. Verify the group and owner for the files you moved in step 3 are set to apache. If the files do not have the apache group or owner, we recommend you change them using the following commands:
   ```
   chown apache:apache f5_*
   ```

4. Next, move the scripts file. Here we need to change not only the ownership of the file we’ve copied, but the permission sets to allow execution of the script in this directory. Use the following commands:
   ```
   chown apache:apache f5_bigip_cpu.pl
   chmod 755 f5_bigip_cpu.pl
   ```

Figure 4  Verifying the file permissions and ownership
5. Log on to the Cacti server user interface (GUI) as an administrator.

6. From the Navigation pane, under Import/Export, click Import Templates (see Figure 6 on the following page).

7. In the Import Template from Local File section, click the Browse button, and navigate to the location you saved the F5 template.

8. Click the Save button. You see a report on the success of the import (see Figure 7 on the following page).

For further information on templates, please refer to the Cacti reference pages.
**Figure 6** Importing a template from the Cacti server

**Figure 7** Results of the import in the Cacti UI (truncated)
Adding the F5 devices to the Cacti configuration

Now that the BIG-IP LTM has been set up to be monitored and the monitoring templates are available in the Cacti deployment, the BIG-IP device can be added to the monitored device lists. Once added, the Cacti server will begin polling the BIG-IP at the intervals defined in the crontab file of the Cacti server.

To add a monitored device

1. Log on to the Cacti server user interface (GUI) as an administrator.
2. From the Navigation pane, under Management, click Devices. The Devices page opens.
3. From the right side of the Devices screen, click Add.
4. In the Description box, type a meaningful description. In our example, we type BIG-IP1.
5. In the Hostname box, type the IP address of the BIG-IP device. You should use IP address, or edit the local hosts table to include this device. Your configuration should not be dependent on additional devices such as remote DNS servers in order to monitor the network hardware. In our example, we type 10.10.50.135.
6. In the Host Template list, select the name of the template you imported in the previous procedure. In our example, we select F5 BIG-IP.
7. In the Monitor Host row, check the Monitor Host box.
8. In the Down Host Message box, type a message to send when the host is down. In our example, we type BIG-IP v10 is not responding.
9. In the SNMP Options section, verify your SNMP community name strings are correct and agree with what you configured on the BIG-IP device previously.
10. Click the Create button (see Figure 8).
11. To verify the BIG-IP has been properly added, from the left navigation pane, under Management, click Devices. You should see the device you just added, with a Status of UP.
12. Repeat this procedure for any additional BIG-IP devices you want to monitor.
### Figure 8 Adding the BIG-IP LTM to the Cacti configuration
Creating graphs for a specific host

Now that we have added devices as well as the graphing and polling templates, we can add specific items we would like to graph for a particular host.

To create graphs for a host

1. From the Navigation column on the left, click Devices, then click the host for which you want to add the graphs.
2. Click *Create Graphs for this Host*, found on the right side of the page.
3. Select the graphs you want to add by clicking the check boxes on the right hand side and click Create.

![Figure 9 Selecting the templates for graphing](image-url)
Configuring the Cacti Monitoring Server to display monitored data collected from the BIG-IP LTM

After adding the monitored devices and the specific data collections to populate the database, the next task is to display the collected information. The primary method, made easy with the Cacti server, is through the graphing tool.

**To add graphs to your environment**

1. Log on to the Cacti server user interface (GUI) as an administrator.
2. From the Navigation pane, under Management, click *Graph Trees*. The Graph Trees page opens.
3. On the right side of the page, click *Add*.
4. In the Name box, type a useful name for this graph. In our example, we type *BIG-IP1*.
5. From the *Sorting Type* list, select *Manual Ordering (No Sorting)*.
6. Click the *Create* button. The Tree Items section appears.
7. On the right side of the Tree Items box, click *Add*.
8. From the *Parent Item* list, select a parent item. In our example, we leave this at the default, *root*.
9. From the *Tree Item Type* list, select an item type. In our example, we select *Graph*.
10. From the *Graph* list, select a graph to add to the tree. In our example, we select *BIG-IP1 - Memory Utilization*.
11. From the *Round Robin Archive* list, select a time frame to control how this graph displays. In our example, we select *Hourly (1 minute Average)*.
12. Click the *Create* button.

*Figure 10  Creating the Tree Items*
To view the graphs, click the Graphs tab at the top of Cacti main page:

![Graphs](image)

**Figure 11** Example of BIG-IP LTM graphs

**Conclusion**

Open source monitoring tools provide the platform to collect and display performance and availability data based on the administrators' preference. F5 provides the means to identify and collect specific data elements from their devices through their SNMP MIB. Together, long term performance data and information useful for troubleshooting network problems can be made available.

This completes the BIG-IP LTM and Cacti Monitoring Server deployment guide. To provide feedback on this deployment guide or other F5 solution documents, contact us at solutionsfeedback@f5.com.
Appendix A: F5 MIB

The F5 MIB is available for download directly from the Welcome Screen of the BIG-IP Configuration Utility (you can return to the Welcome screen by expanding Overview in the left navigation pane, and then clicking Welcome). The link to the F5 MIBs is in the Downloads box on the lower right, in the SNMP MIBS section (Download F5 MIBs (mibs_f5.tar.gz)). The NET-SNMP MIB is also available from this location. The NET-SNMP MIB is an extensible MIB that provides hardware monitoring of the platform, for example temperature, CPU utilization, and so on. The F5 MIB contains specific Application delivery variables.
Appendix B: Additional Resources

The following are additional resources:

DevCentral Wiki page for the F5 Host Template:

Example of Creating a Cacti Graph Template:
http://devcentral.f5.com/Default.aspx?tabid=63&articleType=ArticleView&articleId=346

Example of creating an SNMP Indexed Data Template:
http://devcentral.f5.com/Default.aspx?tabid=63&articleType=ArticleView&articleId=2314

For more information on the Cacti project, see http://www.cacti.net/.

For further Cacti resources and information, see http://cactiez.cactiusers.org/.