

Nagios XI Application Architecture Overview

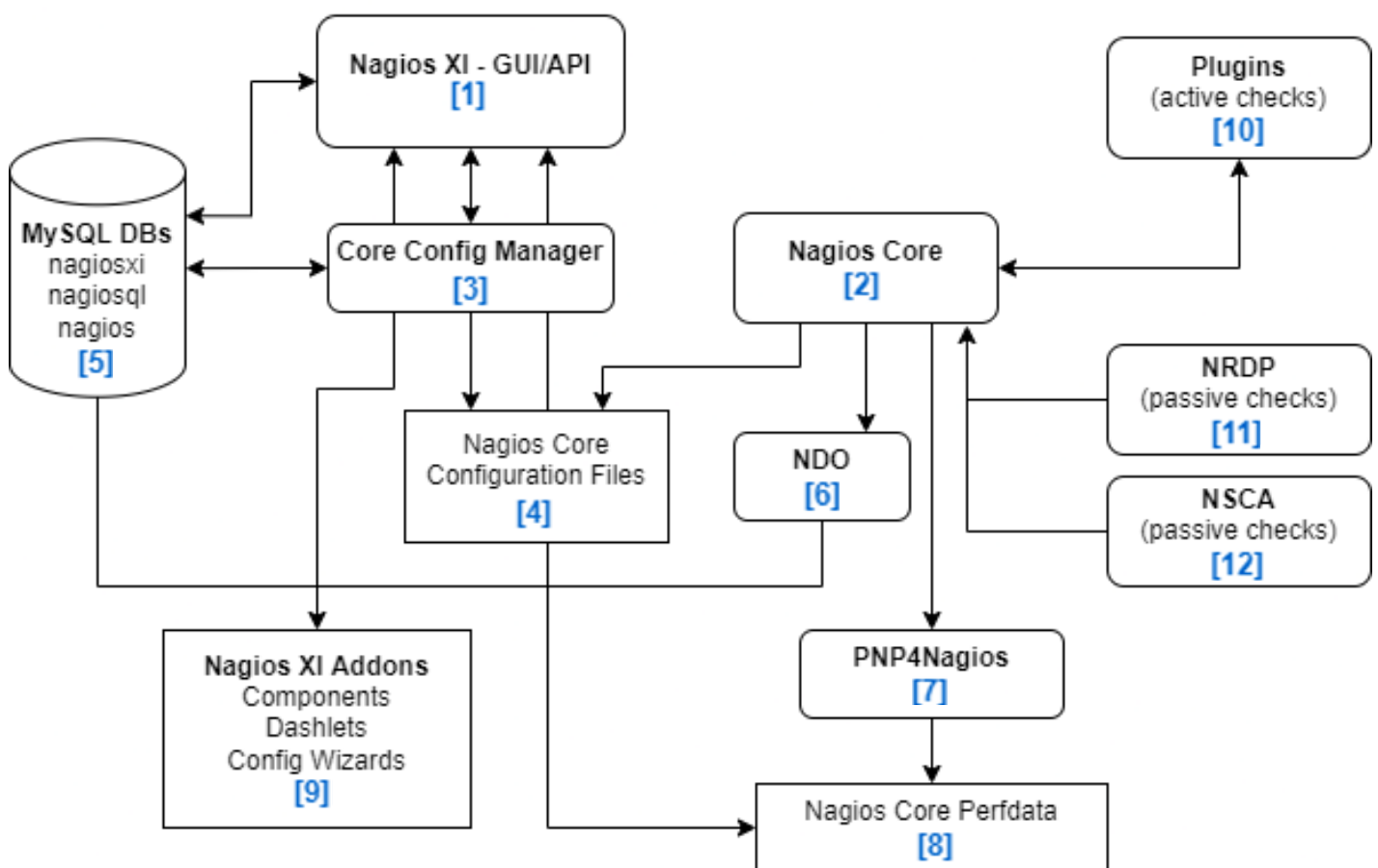
Purpose

This document provides an application architecture overview of Nagios XI, including a diagram of key components and how they interact with each other.

Nagios XI Architecture

Each of the numbers in the following diagram can be clicked to jump directly to the section detailing the related component:

Nagios XI Architecture



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1. Nagios XI - GUI/API

Location: `/usr/local/nagiosxi`

Languages: PHP, HTML, CSS, JavaScript (jQuery)

Database: nagiosxi

Description: Nagios XI's API and GUI is what you see when you navigate to your Nagios XI system. There are lots of different locations inside Nagios XI that are used for different things, so here is a list of the common areas that you may need to look for things:

`/usr/local/nagiosxi/cron`

This is the location of all the cron scripts that are ran by Nagios XI. There are a variety of cronjobs that run constantly to do multiple different processes. You can see the `nagiosxi.cron.d` file which gets installed into the operating systems `cron.d` directory.

One important cronjob that you'll see a lot of is the "cmdsubsys" (`cmdsubsys.php`) which continuously runs and pulls commands out of the MySQL database `nagiosxi_commands`, these commands are command-line style commands ran on the system, generally they run a script in the `scripts` directory or do something necessary for the operation of Nagios XI, such as applying a configuration.

`/usr/local/nagiosxi/html`

This directory mostly contains files that are viewed in your browser. In fact, the apache configuration that is installed on the system during Nagios XI installation points to this directory as the server's home directory. That means if you go into this folder you'll find an `index.php` file, and that's the file you hit when you got to `http://<ip addr>/nagiosxi/` in your browser.

`/usr/local/nagiosxi/scripts`

This directory contains scripts that are either manually run by system administrators or, normally, ran by the Nagios XI GUI behind the scenes. A lot of these scripts are used by the `cmdsubsys` command processor.

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`/usr/local/nagiosxi/var`

This directory is used to store the log files for Nagios XI. There are a lot of files in here, however one of the most important ones will likely be the `cmdsubsys.log` which will allow you to view what the `cmdsubsys` is doing, you can view it live in real time by running the following command:

```
tail -f cmdsubsys.log
```

You can even apply a configuration to see an example of the output. This file is cleared every minute due to the way the `cmdsubsys` is set up.

2. Nagios Core

Location: `/usr/local/nagios`

Languages: C

Repo: <https://github.com/NagiosEnterprises/nagioscore>

Description: Nagios Core is the heart of the Nagios XI system. When you make configuration changes inside XI using Config Wizards or using the Core Config Manager, you are writing configuration files out to the disk. These configuration files are read by Nagios Core, which does the actual monitoring. Nagios Core itself does not put the results of it's monitoring into a database by default, that is done by a NEB (Nagios Event Broker) module called NDO. Perfdata (performance data) from checks is also passed off to PNP4Nagios and that data is stored in time-series RRD data storage for use in graphs within Nagios XI. Nagios Core is an open source project.

3. Core Config Manager

Location: `/usr/local/nagiosxi/html/includes/components/ccm`

Languages: PHP, HTML, CSS, JavaScript (jQuery)

Database: nagiosql

Description: While not actually a separate part of the Nagios XI system, the CCM looks like a component, because it was at one time a separate piece of code. However, over time it was more thoroughly integrated into XI and now it is heavily integrated, things like adding/removing hosts and services from the CCM will remove them from BPI and other areas. As well as removing a user from XI will remove the user from the CCM, etc.

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Due to it being its own separate piece, the CCM has its own database called `nagiosql`, which is what the CCM was based on in the past. This DB holds all the configuration information and when you **Apply Configuration** in Nagios XI (or finish a config wizard) you are writing all the contents of the DB to disk in a format that Nagios Core can understand.

4. Nagios Core Configuration Files

Location: `/usr/local/nagios/etc`

Description: The written out Nagios Core files are located in their own directory. When Nagios Core is restarted, it reads the files that are in the directory and creates all the hosts and services, groups, etc that are in the configuration. This directory on a Nagios XI system is managed by the CCM and does not need to be edited manually, and generally changes will be overwritten unless they are in the `/usr/local/nagios/etc/static` directory. You can also import Nagios Core configuration files by placing them in the `/usr/local/nagios/etc/import` directory and doing an **Apply Configuration** inside Nagios XI.

5. MySQL Databases

Location: Local MySQL server

Description: There are 3 different MySQL databases (on older systems < XI 5, the `nagiosxi` database is actually in postgresql) and these databases serve as the foundation for Nagios XI and how it grabs and processes data for the web interface.

6. NDO

Location: `/usr/local/nagios/bin`

Languages: C

Database: nagios

Repo: <https://git.nagios.com/open-source/ndo>

Description: NDO, formerly NDOutils, is a part of the core of Nagios XI and is directly connected with Nagios Core. NDO takes all the information from Nagios Core and puts it into the `nagios mysql` database. During Nagios XI installation, NDO is installed alongside Nagios Core and the binary for NDO is stored in the `/usr/local/nagios/bin` directory. This binary is used in the Nagios Core configuration file `/usr/local/nagios/cfg/nagios.cfg` and tells Nagios Core to add this module when it runs. Nagios XI handles all this for you, and logs for NDO are shown inside the standard

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Nagios Core logs. NDO is an open source project, but the version (NDO 3) that is used in Nagios XI is located in GitLab.

7. PNP4Nagios

Location: `/usr/local/nagios/bin`

Languages: C, Perl

Description: When Nagios Core runs checks, some (most) checks return perfdata (performance data) and that data needs to be stored somewhere. Nagios Core passes this perfdata off to PNP4Nagios which then stores it into RRD time series storage files. This runs as a daemon called npcd, which is located in `/usr/local/nagios/bin` and runs as a service.

8. Nagios Core Perfdata

Location: `/usr/local/nagios/share`

Description: Perfdata is collected when checks are ran and stored in RRD files thanks to PNP4Nagios. These files are only readable by the rrdtool command and are generally used for Highcharts inside of Nagios XI. There are helper functions inside Nagios XI that can get you this data without reading these files directly or making command-line calls on your own, see `utils-graphs.inc.php` and use the `fetch_rrd()` function to get this data inside Nagios XI.

9. Nagios XI Addons

Location: `/usr/local/nagiosxi/html/includes`

Description: Nagios XI is extensible via Components, Config Wizards, and Dashlets. Each one allows a user to extend the feature set of Nagios XI either through addons made by the company or 3rd party addons made by other Nagios XI users and developers. Types of addons available and where they are located once installed:

Components

Location: `/usr/local/nagiosxi/html/includes/components`

Components are generally extensions of the Nagios XI system. Some components are encrypted and are part of the main XI installation while a lot of components are not and are their own individual pieces that are not actually required for Nagios XI to function. Components generally add new pages or features with a menu item, or link somewhere in the UI.

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Config Wizards

Location: `/usr/local/nagiosxi/html/includes/configwizards`

Config Wizards generally come with a plugin (or use one that is default inside Nagios XI) and a step-by-step process that allows a user to configure the plugin and then applies that configuration to the system. All

Dashlets

Location: `/usr/local/nagiosxi/html/includes/dashlets`

Dashlets are small pieces of code that are used inside Dashboards. Generally they are AJAX-called HTML that is put into it's own container in the Dashboard page.

10. Plugins (active checks)

Location: `/usr/local/nagios/libexec`

Languages: C, Python, PHP, Perl, Bash, etc

Description: Plugins can be written in any language and are run from the command line by Nagios Core. You can also generally run plugins manually for testing purposes. Most plugins in the nagios-plugins project are written in C, and the nagios-plugins are installed by default in Nagios XI during the installation process. This gives the system a default level of plugins to begin with. However, Nagios XI also installs a lot of it's own plugins during install. We also have a lot of plugins that are inside the config wizards that get added during the config wizard installs. Nagios plugins generally follow the [Nagios Plugins Development Guidelines](#).

11. NRDP (passive checks)

Location: `/usr/local/nrdp`

Languages: PHP

Repo: <https://github.com/NagiosEnterprises/nrdp>

Description: NRDP is a system that is inside Nagios XI that allows for sending XML or JSON data to an endpoint (`http://<ip addr>/nrdp`) and NRDP will take that formatted data and pass it into the Nagios Core command pipe using the passive check command, which submits a passive check to Nagios Core. NRDP is an open source project and is a replacement for NSCA.

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12. NSCA (passive checks)

Location: `/usr/local/nagios/bin`

Languages: C

Repo: <https://github.com/NagiosEnterprises/nsca>

Description: NSCA is an open source project that is similar to NRDP where it takes incoming data, passed by the `send_nsca` file to your NSCA installed on the Nagios XI system. By default Nagios XI installs NSCA on the system, it uses `xinetd` to run it and its binary is located in `/usr/local/nagios/bin`. Due to its complexity, NSCA has been mostly deprecated in favor of NRDP but it is still a part of Nagios XI due to legacy uses in certain environments.

Finishing Up

This completes the documentation on Nagios XI Application Architecture. If you have additional questions or other support-related questions, please visit us at our Nagios Support Forum, Nagios Knowledge Base, or Nagios Library:

[Visit Nagios Support Forum](#)

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