

Introducing NEMS Linux: Part 2 – Monitoring a Local Linux Server

November 1, 2018 Robbie Ferguson, Linux, Tutorial

The Nagios logo is displayed in a white, stylized, hand-drawn font against a black background. The letter 'N' is underlined. A registered trademark symbol (®) is located to the upper right of the 's'.

The Industry Standard In
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Last month I introduced you to NEMS Linux, the Nagios Enterprise Monitoring Server for ODROID devices. If you haven't read that article yet, please start there. It will take you through the initial setup of NEMS Linux and arm you with some important information to help you get started. This month, we're jumping right into our first exercise as we learn to configure NEMS Linux to monitor a local Linux server's uptime. Through this article, I will demonstrate how some of the features of NEMS Configurator (NConf) are interconnected, and will prepare you for adding IP-based hosts to your NEMS server.

A "Host" in NEMS Linux is any device you wish to monitor. This can be a computer, or a thermostat; it can be a router or a printer. The options are truly endless, and while NEMS Linux is free to download and use, there are no software-based limitations on how many hosts you can have set up. As NEMS Linux on a Raspberry Pi 3 can easily handle over 100 hosts, I have strong suspicions the ODROID community will be able to push things even harder. After all, the XU4 is a very powerful little piece of kit.

Adding a Host: Monitoring a Linux Computer on Your Network

Adding a host for monitoring within NEMS is done through the NEMS Configurator (NConf) user interface. You'll find this tool on the Configuration menu of your NEMS Dashboard. Within NConf, click the "Add" link next to "Hosts" on the left navigation. This will present you with the Add Host screen.

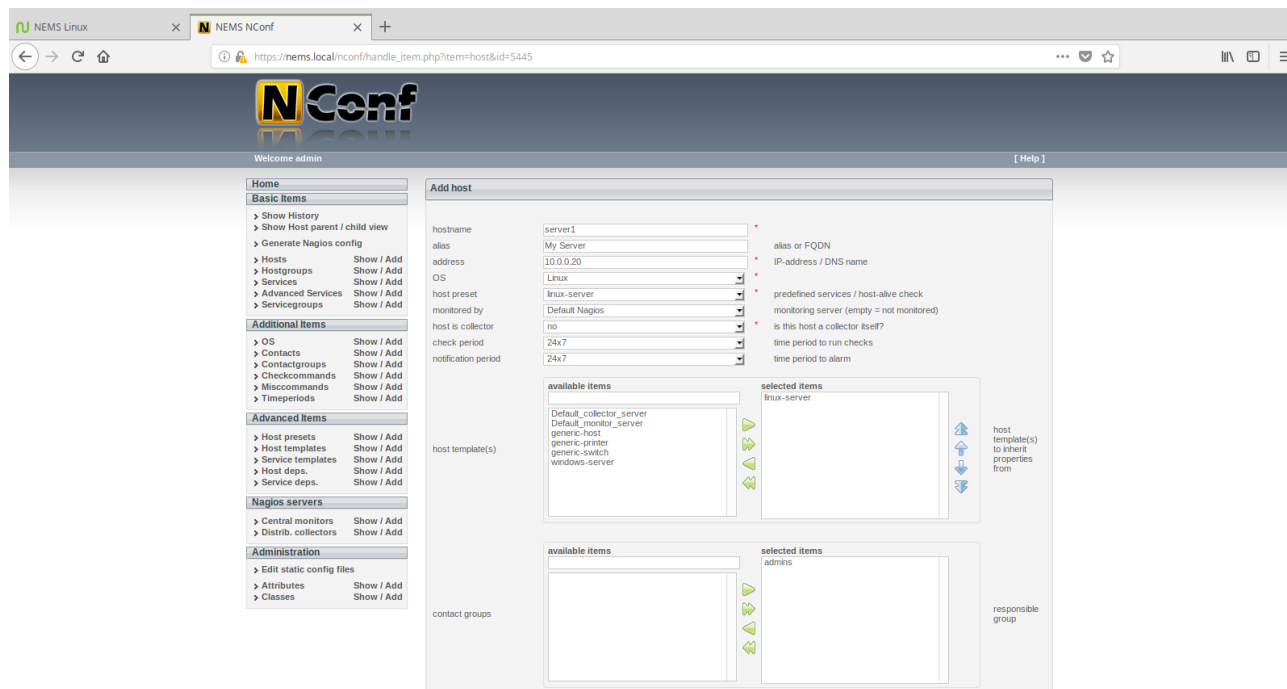


Figure 1 – Add a host to NEMS Linux using the NEMS Configurator

As illustrated in Figure 1, enter the hostname—a friendly alias for your own reference as well as the IP Address of the host. As a side note, you'll want to make sure your hosts have static IP addresses so they don't change. Personally, I prefer to add DHCP reservations to my router rather than manually assigning the IP on the device. This keeps things simple and make it easier to ensure devices on my LAN always receive the same IP address, and that I don't accidentally assign the same IP to two devices.

Next, in the OS drop-down on the same screen, select your host's operating system. Note that if you don't see an appropriate type, you may also add operating systems under "Additional Items" in the left navigation menu. However, for our example we'll be adding our Linux server. "linux-server" is an out-of-the-box preset, so we will choose that. Refer to Figure 1.

A "Host Preset" allows you to add checks that are always used for this type of host. To help us understand what this is actually doing, let us digress for a moment and take a look under the hood. You can see what checks are going to be automatically applied via the selected Host Preset by pressing the "Show" link next to "Host Presets" on the left navigation menu.

A screenshot of a web form for configuring a host preset. It has two rows: the first row is labeled 'host preset name' and has a text input field containing 'linux-server'; the second row is labeled 'host-alive check' and has a dropdown menu with 'check-host-alive' selected. Both input fields have a small red asterisk to their right.

Figure 2 – linux-server Host Preset

Realizing that the linux-server Host Preset initiates the `check_host_alive` check command, we can review what that actually does by clicking the “Show” link next to “Misccommands.”

A screenshot of a web form showing details for the 'check-host-alive' command. It has two rows: the first row is labeled 'misc command name' and has a text input field containing 'check-host-alive'; the second row is labeled 'misc command line' and has a text input field containing '\$USER1\$/check_ping -H \$HOSTADDRESS\$ -w 30'. Both input fields have a small red asterisk to their right.

Figure 3 – check_host_alive check command details

It’s running `check_ping`—a Nagios check command to simply ping the IP address we provide. The nice thing is, you didn’t even have to script that (refer to this statement from Part 1: “[NEMS] does away with the old Nagios scripting requirement”). I wanted to show you how it works, but as you’re just getting started with NEMS Linux, you will just select linux-servers and carry on, knowing that this will initiate a ping on that host (based on this example).

Next, we need to change “Monitored By” to the only option available: Default Nagios. That is the preconfigured Nagios Core instance running on your NEMS Linux server.

Host Template != Host Preset

A Host Template differs from a Host Preset in that it tells NEMS how we want our Host Preset to be performed: the monitoring schedule, the alert thresholds, and so-on. Based on the included linux-server Host Template, our linux-server Host Preset will check if the host is alive by pinging it every 10 minutes, and will send notifications during working hours if there is a problem. These defaults can always be changed by editing the Host Template. Of course, you can create your own presets and templates as you learn to use the system, though I recommend starting with the samples until you have a few hosts working.

In the Host Templates section of our Add Host screen, we’ll highlight linux-server and press the right arrow icon to move it to the “Selected Items” list as shown in Figure 1.

The only other item we must add to our host is who to contact if it is having problems. If we don’t specify this, no notifications will ever be received. By default, there is only one option, Admins. Highlight Admins and press the green arrow icon to move it to the Selected Items list. Refer again to Figure 1.

Because we are using the Host Template, we do not need to specify our check or notification intervals: they are specified within the Host Template. If you were not using a Host Template, you’d need to specify those values here. Because we are using a Host Template which carries these values, we can just save the new host by pressing “Submit.”

On the next screen, you will be given the opportunity to add more service checks to this host, but for the sake of our example and because we are using Host Presets and Templates, we can skip this part.

Tip: In some cases, you may desire that your host checks occur at different intervals than are specified within the Host Template. For example, you may wish your mission critical server to be pinged every minute rather than every 10 minutes. In these cases, rather than editing the Host Template (and thereby impacting all hosts which use that template) you can specify unique values on the Add Host screen, which will override the Host Template values for this host.

Generate Nagios Config: Make Your Changes Live (In Review)

To make your changes live and begin monitoring your new host, press the Generate Nagios Config link on the left navigation. You should see 0 errors. If you do see errors, press the syntax check bar and review where you went wrong. NConf is very good at showing you where to find the error is so you can go back and fix it.

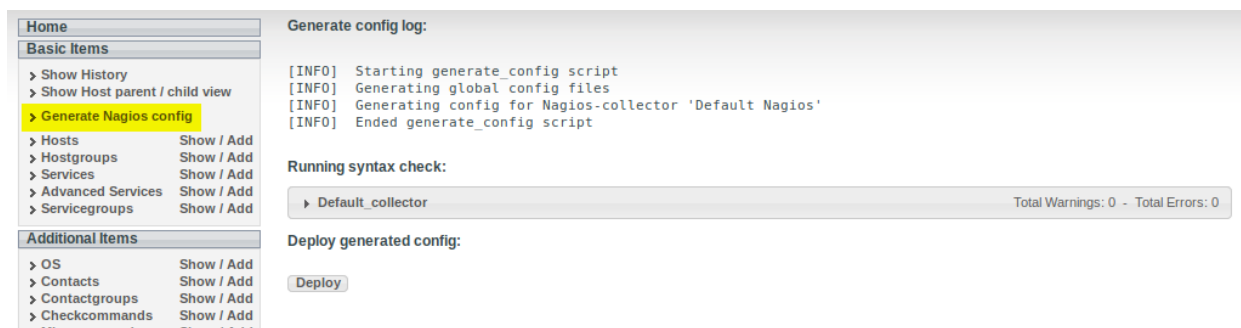


Figure 4 – Generate Nagios Config with the NEMS Configurator

If everything checks out, press “Deploy,” and your new host will instantly be activated in Nagios.

Monitoring Your Assets

Now that we’ve configured our first host, let’s see how to check its status. There are several ways to keep tabs on your assets with NEMS Linux. For the Nagios purists, Nagios Core is included on the Reporting menu. We’ll instead look at Adagios, found on the same menu. Adagios offers the same overall functionality of Nagios Core’s front-end but replaces it with a modern, responsive web interface.

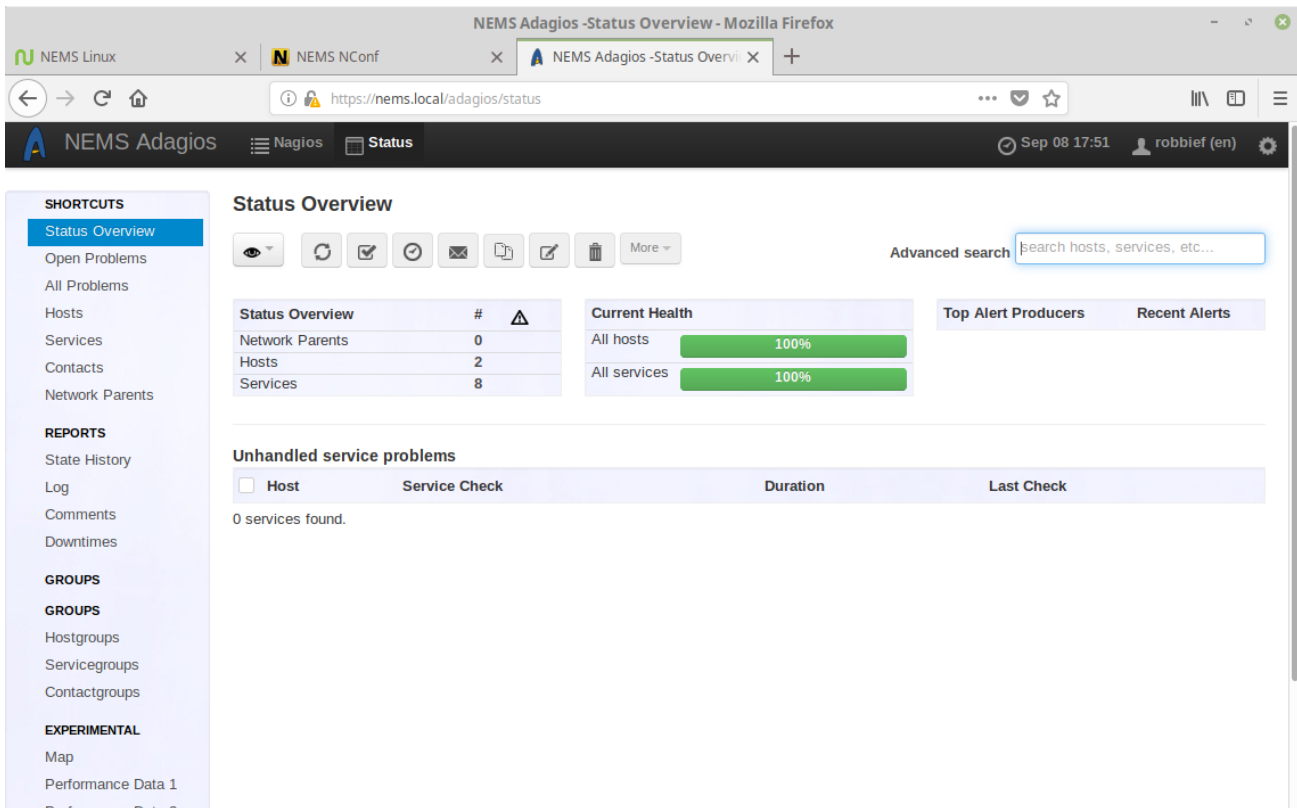


Figure 5 – Adagios interface on NEMS Linux 1.4.1

To check the status of our hosts, simply click “Hosts” on the navigation to the left.

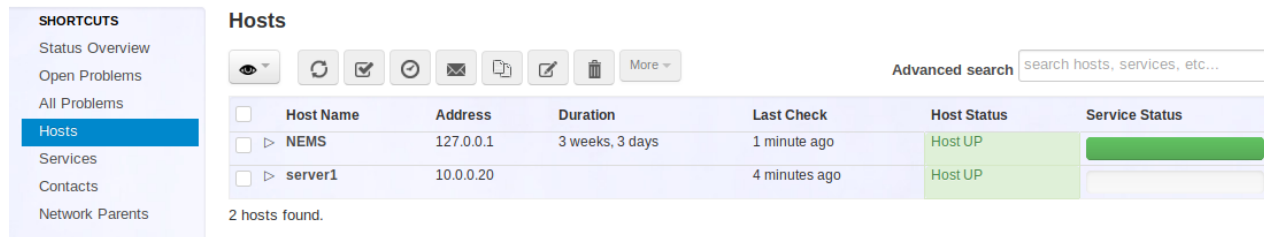
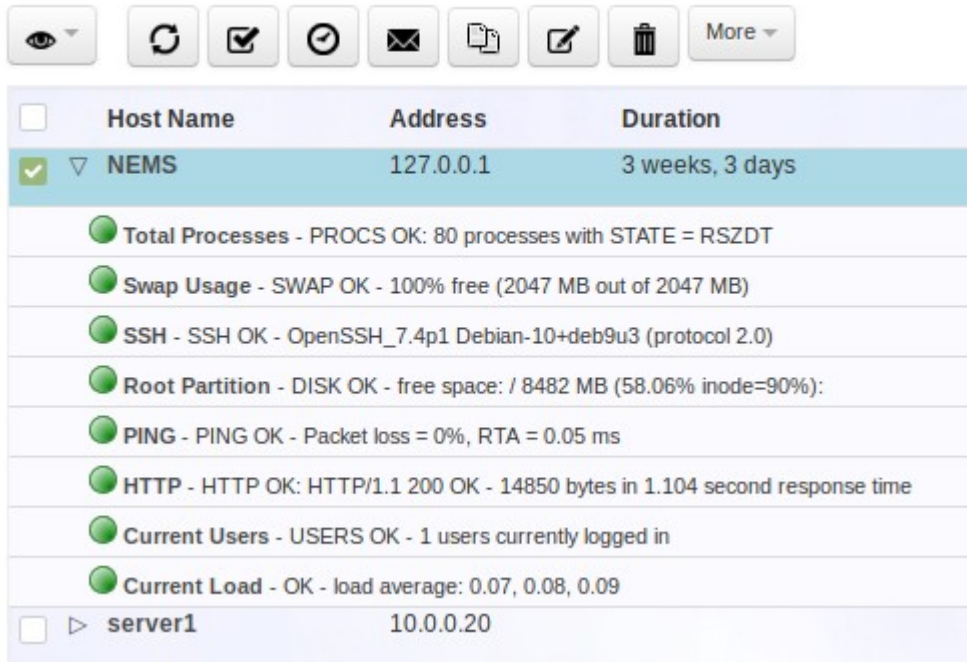


Figure 6 – Adagios hosts view

You’ll see the host we added–server1 in my example–is showing with the status of UP. This means the ping replied. There is no Service Status, since we did not add any extra service monitors. To see an example of what is possible, expand the NEMS host (which is included on your NEMS Linux server) by clicking the triangle next to its name.

Hosts



The image shows a web interface for managing hosts. At the top, there is a toolbar with icons for eye, refresh, checkmark, clock, envelope, document, pencil, trash, and a 'More' dropdown. Below the toolbar is a table with columns for Host Name, Address, and Duration. The first host, 'NEMS', is selected and expanded to show a list of service checks, each with a green status indicator and a description. The second host, 'server1', is not selected and is not expanded.

<input type="checkbox"/>	Host Name	Address	Duration
<input checked="" type="checkbox"/>	▼ NEMS	127.0.0.1	3 weeks, 3 days
<input checked="" type="checkbox"/>	Total Processes - PROCS OK: 80 processes with STATE = RSZDT		
<input checked="" type="checkbox"/>	Swap Usage - SWAP OK - 100% free (2047 MB out of 2047 MB)		
<input checked="" type="checkbox"/>	SSH - SSH OK - OpenSSH_7.4p1 Debian-10+deb9u3 (protocol 2.0)		
<input checked="" type="checkbox"/>	Root Partition - DISK OK - free space: / 8482 MB (58.06% inode=90%):		
<input checked="" type="checkbox"/>	PING - PING OK - Packet loss = 0%, RTA = 0.05 ms		
<input checked="" type="checkbox"/>	HTTP - HTTP OK: HTTP/1.1 200 OK - 14850 bytes in 1.104 second response time		
<input checked="" type="checkbox"/>	Current Users - USERS OK - 1 users currently logged in		
<input checked="" type="checkbox"/>	Current Load - OK - load average: 0.07, 0.08, 0.09		
<input type="checkbox"/>	▶ server1	10.0.0.20	

Figure 7 – Expanded view of Host reveals configured service checks

I would also like to encourage you to test both NEMS Mobile UI and NEMS TV Dashboard, both of which are also found on the Reporting menu of the NEMS Dashboard. The first is meant to offer you a complete mobile interface for monitoring your assets, and the latter allows you to set up a TV display in your server room that shows a real-time tactical overview of your NEMS host and service checks.

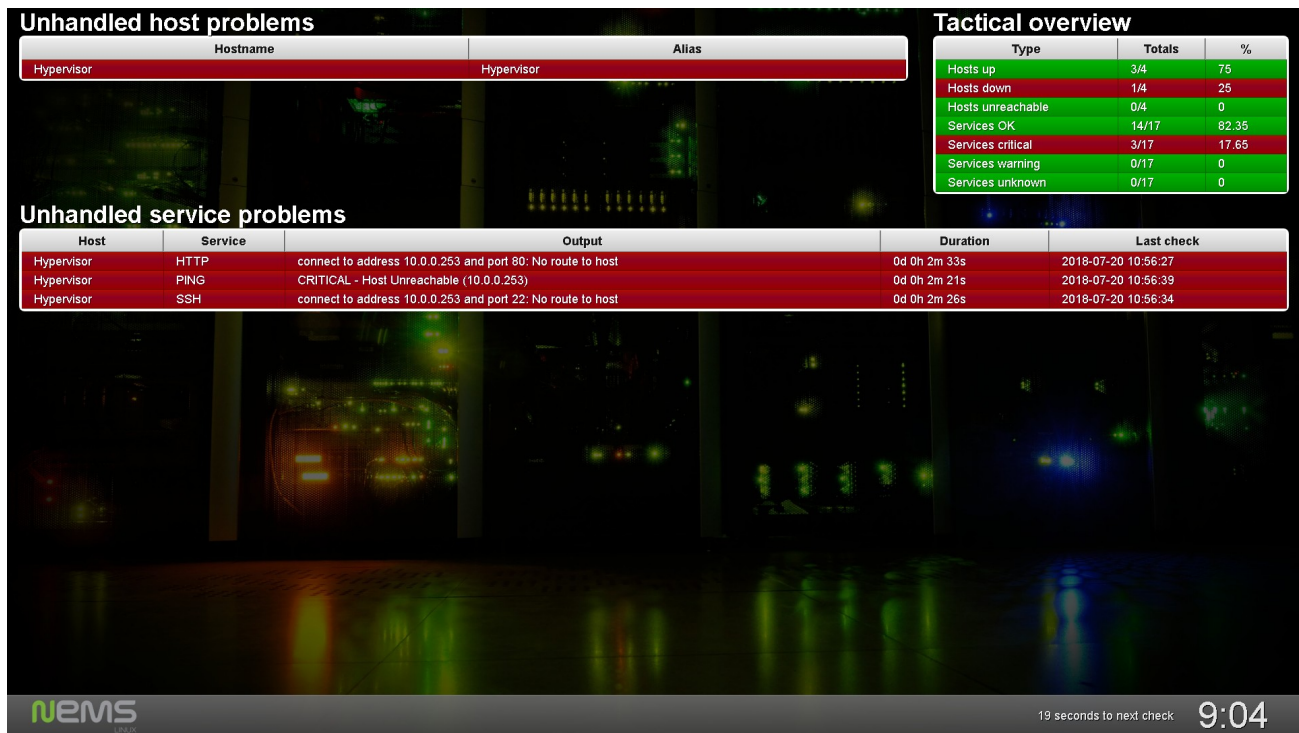


Figure 8 – NEMS TV Dashboard on NEMS Linux 1.4.1

Learn More

NEMS has an active Community Forum. I check in quite regularly to provide free support to users. I also offer commercial one-on-one priority support for those needing a higher level of support. NEMS Linux is free to download and use. Its source code is available on GitHub. Download NEMS Linux for ODROID at <https://nemslinux.com/>

Be sure to join me again in next month's edition of ODROID Magazine as we go through our next exercise: Configuring Service Monitors on NEMS Linux. We'll learn how to monitor specific network ports for uptime.

Robbie Ferguson is the host of Category5 Technology TV and author of NEMS Linux. His TV show is found at <https://category5.tv/> and his blog is <https://baldnerd.com/>.