Picture: Nagios

The Nagios Core homepage is as plain as the range of functions of the entire package.

In PRTG sensors patiently wait to be added to a monitored device with a simple click of the mouse.

Picture: Paessler

Nothing Comes without a Price

Network monitoring – open source software is popular, and in the realm of open source network monitoring, 'Nagios' is a huge hit. funkschau investigated whether this free product can compete with the equally-popular, commercial product 'Paessler PRTG Network Monitor' in a comparison test.

Our networks are growing inexorably; every day new cable-bound and wireless devices in the form of desktop computers, laptops, tablets and smartphones are being added. This increasing number of end-user devices requires additional computing power, connectivity and memory space which we create with new servers, switches, routers and storage units. The network growth and thus the increasing complexity ensure that the demand for network monitoring products remains high. The market offers robust commercial and free open source network monitoring products that are chock full of features, so there seems to be a solution for every budget size. But do companies really save money using open source products instead of a commercial package? We've compared the popular network monitoring product Paessler PRTG Network Monitor (commercial) with Nagios Core (open source) in order to answer this and other questions.

Both products offer performance monitoring and event management for end devices such as servers, switches, routers and USVs as well as services like websites or business applications. They notify administrators regarding problems and create various reports using the collected data to document the status of the network, network devices and services. Both products use simple functions like ping requests, among others, for monitoring single devices as well as SNMP. The features of both products include automatic network searches and network device discovery ('Auto-Discovery'), distributed monitoring, maps, diagrams and graphs, alerts and support of IPv6. The products thus seem to share many similar functions but under the surface they differ considerably.

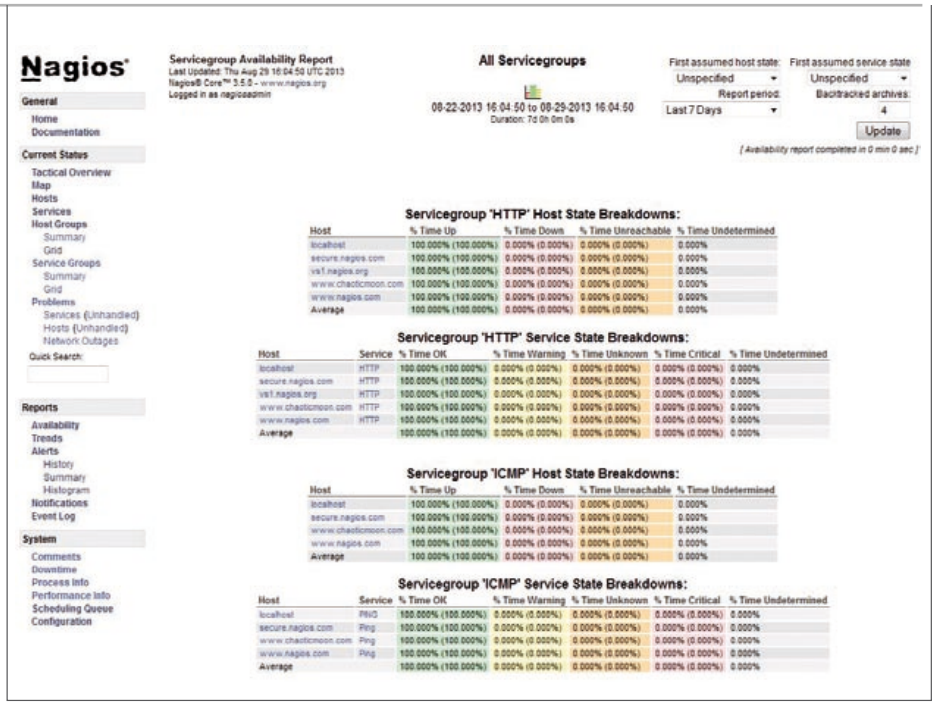
Nagios Core 3.5

Nagios, which first appeared in the late 90s, is most suitable for limited environments that don't include too many devices as the necessary provisioning for devices in large networks with many nodes is extremely time consuming. The product was designed for Linux but can be run on other Unix platforms relatively easily. Though Nagios Core is an open source software, commercial technical support is available through Nagios Enterprises.

Nagios monitors many network services, including SMTP, POP2, HTTP or NNTP and monitors the use of host resources, such as the CPU load,

memory and disk usage. Thanks to nearly 2000 plug-ins, the functionality of the product can be extended for example to monitor services that are not supported by the core product initially. Anyone with sufficient experience in using languages like C, Perl or Python can even write his own plug-ins.

Nagios Core really is free. However, Nagios Core does not include much more than the open source monitoring engine. You don't even get a quick start guide for setting up the product. Not to mention features like SNMP traps, dashboards, mobile app, configuration assistant or backend database. Anyone who isn't ready to agonize themselves by building up their monitoring solution using free add-ons – as far as that is possible at all – must be willing to invest money, at least $1995 to start. This will cover the Nagios XI Standard Edition for a maximum of 100 hosts and five support questions. The Nagios website still lists the Nagios Business Edition for $1295 but clicking on this link redirects the user to Nagios XI. The Nagios Core Student Edition is available for $50 and the Professional Edition costs $250. These packages are far less expensive than the Nagios XI Standard and offer more functions than the free version but do not include half of the XI Standard features. Things like a dashboard, database backend, report planning and configuration assistant are not included. On top of that, the student and professional editions are only available as preconfigured virtual machines based on CentOS 6 which makes it unsuitable for most companies. The bottom line is that minimal basic functionalities are free while a complete package that is comparable to commercial monitoring products starts at $1995.



Picture: Nagios

The reports created by Nagios Core are limited to the most necessary data and are generally not designed for export.

Nagios setup: simple to complicated

Nagios Core requires a Linux or Unix machine with a web server (preferably Apache) if the web interfaces included in the package should be used. In Nagios jargon these web interfaces are called CGIs (Computer Generated Interface).

To install Nagios, the respective package must be downloaded and various configuration settings must be made. The way this works depends on the Linux distribution. In many distributions, the Nagios packages are available in the repository which makes things easier. If no fitting package is available, the source code is downloaded and compiled. This also depends on the Linux version. The quick start guides on the Nagios website are based on hopelessly outdated Linux versions and are therefore not entirely useful. Generally, however, the following steps must be taken:

1. Create a user account for Nagios, create a Nagios group if necessary.
2. Download Nagios and the desired plug-ins.
3. Compile and install Nagios.
4. Adjust configuration by editing the configuration file.
5. Configure the web interface.
6. Compile and install the Nagios plug-ins.
7. Start Nagios and configure the automatic start.

Installing Nagios this way, the user should have a solid understanding of Linux and we also recommend looking online for relatively up-to-date documentation from third parties.

Nagios does not require agent programs or SNMP on the hosts to monitor 'public' services or protocols like HTTP, FTP or SMTP. However, the administrator won't get far with this. If he wants to monitor information like hard drive, CPU and memory usage, user information, running processes or services – all things that are considered 'private' services for Nagios – he will have to install agents on the hosts. Of course, there are different agents for different hosts, for example Linux and Windows servers, routers, switches and printers. Most of the time, installing the required agents isn't sufficient; various configuration files have to be updated in order to even begin monitoring. These configuration files have to be adjusted using an Editor – changing the configuration over the graphical user interface is not possible.

No Longer State of the Art: The Web GUI

The user interface in the browser is compiled from several of the abovementioned CGIs. The homepage shows the basic navigation on the left side and a section with information/messages and links in the center. Here, the administrator has access to software updates, support and other useful resources. Using the menu on the left side, the administrator can navigate to information gathered by Nagios, from

a general overview to detailed information and reports on the hosts and identified problems.
A 'Tactical Overview' shows the current system status. The view presents, for example, hosts and services with a summary of the related statuses, marked with 'ok', 'critical', 'warning', 'unknown', and 'pending'. The network diagram is a graphic display of all hosts with their related statuses and connections. Details on a host can be viewed by hovering the mouse pointer over the desired icon. The network diagram is great in theory as it offers a direct overview of the network infrastructure. However, this is not practical for larger networks with several hundred hosts.
The Nagios Core user interface is otherwise rather unimpressive with its plain and archaic appearance. It could definitely use an update to bring the GUI up to par and to make data tables more organized and easier to read. The plainness of the interface does have an advantage: navigation and the drilldown from host to host are fast. However, PRTG shows that modern interfaces can be just as fast.
Nagios Core comes with several preconfigured availability, trend and alert reports that are presented on the screen and allow administrators to execute several ad hoc reports. Parameters for these reports are generally available in dropdown lists. The reports are always based on hosts, host groups, services or service groups. The design of the reports is like that of the user interface: archaic. And I could not find an option to export a report – regardless of the format. There might be an add-on or a plug-in, but I didn't put in the effort to look for one on the Nagios Exchange website. This kind of basic functionality should be integrated in the product.
The messaging system looks a little better as the product can send messages via email or text message, for example. A function for notification escalation is available in the standard version as well, at least insofar as the program can notify different people according to the severity of a problem. Nagios sends notifications if status changes have been identified or if a host or service remains in a not-OK state for a predefined length of time. All users in a contact group assigned to the related host or service receive the notification.
All of this must be configured, of course. Nagios Core's graphical user interface is suitable for viewing configuration settings but administrators can only set parameters or change existing settings by editing the configuration file in an editor. This not only applies to the above-mentioned notification system, but is valid for all configuration settings for hosts, services, host groups, etc. Even if just a threshold value for a test should be changed, the related configuration file has to be found and edited. I don't find this to be user friendly but there are surely administrators out there who see that differently.
The word 'Core' in the product name 'Nagios Core' is a good indication of what can be expected from the product: basic functions for infrastructure monitoring. The product can be sufficient and even work well for certain environments, especially smaller ones. However, smaller environments are usually those where expertise in Linux/Unix is lacking and it can be difficult to configure the product properly and get it running without this expertise. Whoever can afford professional support quickly ends up in the same price class as a commercial solution like PRTG where professional support is included in the price.

Characteristics

Nagios Core

Manufacturer: Nagios Enterprises

Characteristic:
Network Monitoring Software

Price: Free, open source

Web: nagios.org

Pros/Cons

+ No purchase price
+ Good performance
- Setup can be complicated
- Minimal range of functions, few features
- Requires solid Linux know-how

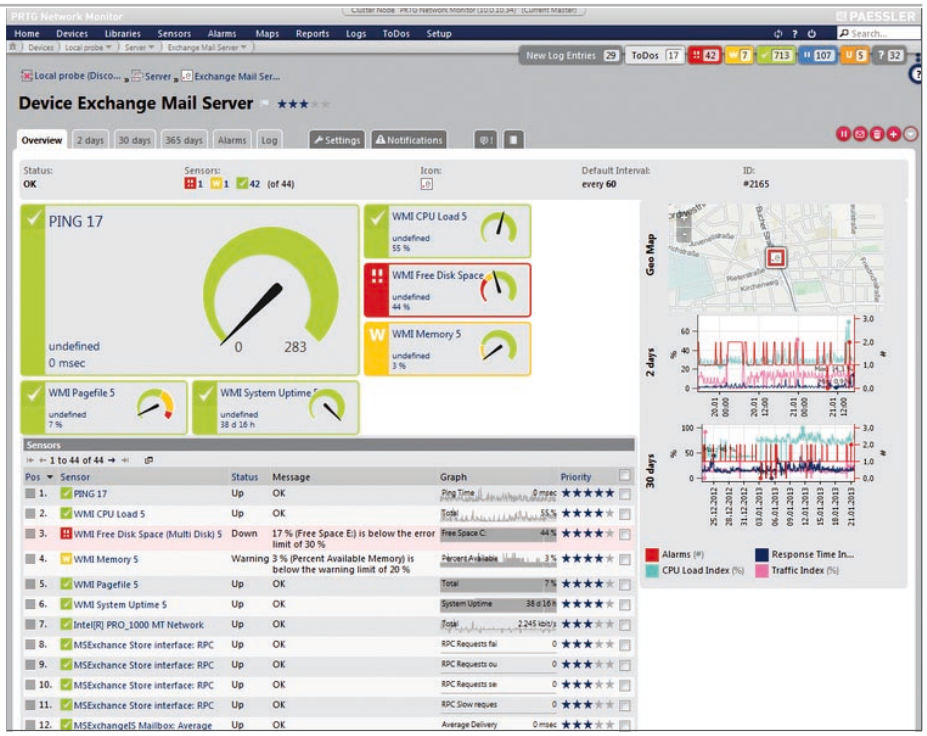
★ ★ ★ ★ ★

PRTG Network Monitor

PRTG Network Monitor 12.3.3 has always been running so well on our network that we hadn't run updates on the system for a long time. However, when I received notification that version 13.3.7 was downloaded from Paessler's Canary Release Channel, I decided to finally update the software, especially because I expected to find big changes and additions from the past year – and I wasn't disappointed.
The automatic update, or rather, the automatic installation of the automatically downloaded new software ran absolutely seamlessly as I'm used to with Paessler. The only criticism I have is that the installation routine restarted the computer. I am not certain that I was notified of this beforehand but that is irrelevant. I think nothing of this kind of reboot for a software installation or update as they usually come at inopportune times. I am convinced that software developers could find a better solution if they really tried.
Though this was an update of an existing PRTG instance, installing a new PRTG product on a Windows machine is not much more difficult: the administrator downloads the product from Paessler's website and starts the executable file. In a few minutes, the PRTG installation is complete, including all supporting components, like the database engine. I mention the database engine for a reason: many comparable monitoring applications from other manufacturers use Microsoft SQL Server for data storage but this is not optimal for saving a lot of small, constantly changing data records and the startup configuration isn't always as easy as the manufacturers would have us believe. Integrating the data storage in PRTG eliminates these difficulties and it's swift as an arrow.
Starting the management interface in the browser for the first time activates the Configuration Guru which takes the administrator step by step through necessary or useful settings for the PRTG configuration and thus ensures that nothing is forgotten. For example, this little program informs users that it could

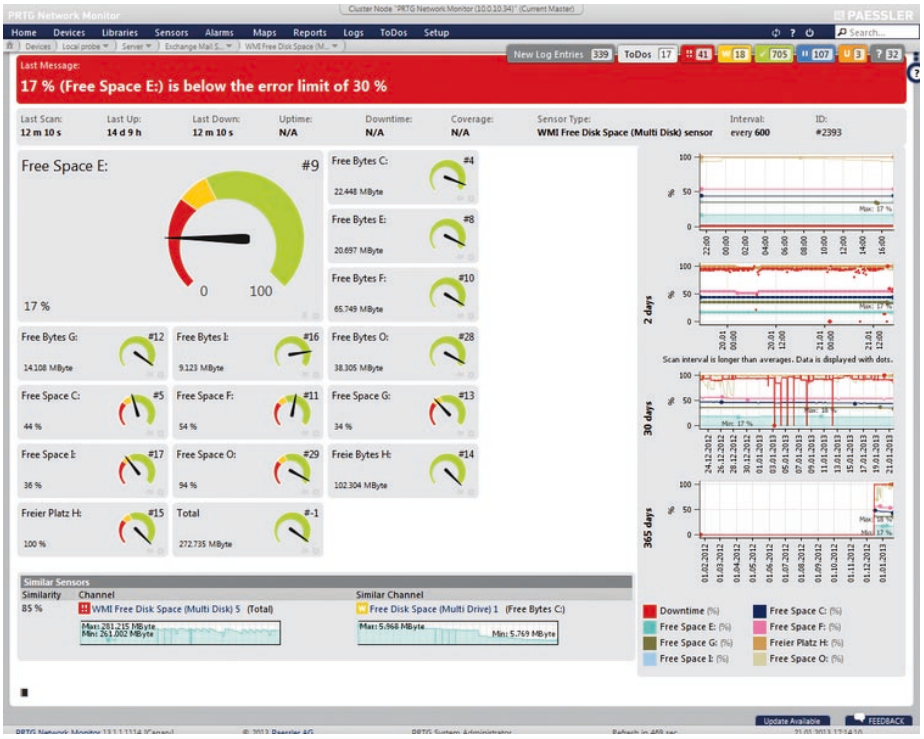
be a good idea to activate SSL encoding. With this kind of guidance, configuration settings like login information for Windows, Linux, Solaris and Mac OS systems, VMware, Xen server and SNMP login data and other server settings for domain controllers, Exchange and mail servers that should be monitored can be made without difficulty. Before the Guru returns to his bed of nails for some much deserved rest, he suggests running a full network search. It's a good idea since it refers to the network discovery typical to network management applications. The administrator enters the name of a group to which found devices should be added, specifies a basis address for IPv4 as well as a start and end address, clicks on 'Save and Continue' and can start familiarizing himself with the management interface while the discovery runs in the background.

A device must be created in the PRTG configuration for every device in the network that should be monitored by the PRTG network monitor. The term 'device' cannot be taken literally as websites, clouds and Internet connections are considered devices in addition to servers, workstations, switches or APs. These devices are assigned sensors, each of which monitors a specific aspect of the network or device. With Nagios, these settings are made manually in various configuration files. With PRTG on the other hand, the type of device found is determined automatically during the discovery and the required sensors are installed automatically by which process the program creates a solid foundation that the administrator can build upon later. Like the term 'device', the term 'sensor' must be interpreted differently than users of other management applications might think: a sensor is not software that runs on the monitored devices. Instead, the sensors run on a central probe. From there, they call information from the clients using WMI or SNMP, for example.



Picture: Paessler

The device pages of the PRTG management interface show what is important to the user.



Picture: Paessler

The wide, colored status bar in PRTG shows the administrator clearly whether the monitored resource is alright or not.

Interface with Turbocharger

I was very curious about the new interface – whether it would use HTML, XHTML or HTML5 is probably not important to the user but the intensive use of Ajax should be. If used properly – which Paessler does by the way – Ajax reduces repeated loading and processing of HTML, CSS and Javascript which allows faster use and is thus positive for the user. PRTG rarely reloads entire pages, but reloads single elements instead. Most of the tasks are displayed in popup windows within the browser instead of on new pages that have to be loaded individually. As a whole, this simplifies navigation – the user can concentrate on present tasks and can find his way back to the start page easily. All dialogues are implemented as popups so the user never loses the context of the current task. Even if new data must be entered within the user interface, the user ends up where he was before as soon as the data has been entered.

Paessler advertised the new web interface as having a single page design. I couldn't even begin to imagine what this should look like. Thankfully, Paessler and I have different ideas of what single page

design should be. For me, a single page design is a design where the entire website is contained in a single page and all information can be found by scrolling up and down. Of course, a navigation menu is available for this type of design as well where clicking on the menu items does not open and load new pages but jumps to an anchor on the same page. Paessler did not use this method – it would be ridiculous for this type and complexity of application. What Paessler did mean is the following: if the user clicks on a link or button on a page, the click usually does not load a new page, but starts or refreshes a specific element. Paessler also includes more information on a page than before. The application still consists of separate pages for devices, sensors, alarms, etc. This 'single page design' is used in combination with Ajax as mentioned above, the advantages of which have also been mentioned above. And yes, the application and interface are very, very fast.

While the Nagios user interface achieves its speed rather through omission and reduction, PRTG is able to achieve high performance using modern web technique and skillful programming while maintaining highly interactive web pages with an abundance of clearly presented information and supporting graphic elements.

Many Detail Improvements

The sensor pages present the user with obvious changes including colorful graphical presentation of current live data. The settings for the individual sensor channels can be changed by clicking on the sensor icon – the administrator doesn't have to change configuration files in an editor like with Nagios. A wide colored bar clearly displays the current status of the sensor. If a sensor offers top lists, for example for Netflow and sniffing, PRTG shows the respective graphic directly on the sensor page. The device pages have undergone similar changes. These pages now show the device sensors in varying sizes.

The user can set priorities and favorites in PRTG, sort lists, and show lists of favorites. This has been made even easier as it is now possible to change the priority and favorite status of a device or sensor at any time and in various places using a corresponding symbol, for example in the device tree. PRTG uses this information to determine the order of display and the relative display sizes of the devices and sensors on the pages, among other things. Paessler's opinion is that the user should be able to decide what he finds important. I have to agree and think this is the perfect feature to achieve that goal.

A new heuristic calculation now shows 'similar sensors.' PRTG searches the monitoring database every day for sensors that show similar behavior on that day. This analysis is completely automated and is independent of sensor types. What is the point of the feature? It helps the user find links in the network. For example, one result might be that port 12 of router A generally shows the same bandwidth consumption pattern as port 2 from server B – and the administrator had no idea of the connection. This feature thus delivers information that supports behavior and error analysis that otherwise would not have been recognizable.

Of course, the new version includes a multitude of error corrections as well as various improvements and enhancements for the sensors and some other features. Whether social network integration was really necessary is arguable – I don't really feel the need to become a PRTG Facebook fan via the web interface. I've already written about the PRTG app for iOS and Android in a First Look – overall, it is just as accommodating as the new web interface. PRTG has done a lot for SNMP. For example, the internal system for SNMP monitoring has been majorly revamped. It now supports SNMP-v3 with AES encoding. The error handling for many SNMP sensor types has also been improved.

Characteristics

PRTG Network Monitor 13.3.7

Manufacturer: Paessler

Characteristic:
Network Monitoring Software

Price: up to 10 sensors free, otherwise from 300 Euro for 100 sensors

Web: www.paessler.com

Pros/Cons

+ Very fast, modern web interface
+ High usability
+ Simple setup, simple configuration
+ Great cost-performance ratio

★ ★ ★ ★ ★

The Catch

The transition to the new web interface has one catch: since PRTG 7 users have had the freedom to change CSS code, images, icon sets and colors and to add new elements. Many organizations probably even gave PRTG their own branding. PRTG is still open for this kind of changes, however a lot of code was changed in the process of redesigning the web interface. This means that user-defined changes are not automatically transferred. The users will probably have to rework these changes manually. Luckily, Paessler will describe how the new interface can be adapted in the new API documentation.

The Cost

The license model for PRTG is designed around the number of sensors. PRTG Network Monitor is available as a free download for up to ten sensors. This is sufficient to test the product. A 30-day test version is available for those who want to test the product in a large network with an unlimited number of sensors. If more than ten sensors are needed for operative use, pricing starts at 300 Euros for 100 sensors. Sensor packages are available with 100, 500, 1000, 2500 or unlimited sensors. Of course, the larger the package, the less each individual sensor costs. The maximum cost of the product with unlimited sensors and a core server is 8000 Euros (PRTG Network Monitor Unlimited), for unlimited sensors and unlimited core servers, 24000 Euros (PRTG Network Monitor Corporate).

Conclusion

Nagios, or rather, Nagios Core, is a popular open source monitoring tool that can be downloaded and used for free by anyone. Whether a network administrator can get far using this software or whether it is really less expensive than

using a commercial monitoring package, was to be determined in a comparison with the just-as-popular PRTG Network Monitor. It quickly became obvious that this was a comparison like 'Dacia Logan vs. Mercedes S-Class'. First: Yes, Nagios Core can be acquired for free while PRTG costs 300 Euros or $400 for 100 sensors. In this price, however, the first 12 months of software maintenance are included which not only includes free software updates but also professional priority email support. Comparable professional support for Nagios Core starts at $2995/year and only includes 5 support tickets. Those wanting or needing professional support are therefore better off with PRTG. Those who think they can do without could save a few dollars, at least off the purchase price, by going with Nagios Core.

Of course, it all comes down to the contents of the package. Nagios Core does not contain much more than a monitoring engine which enables infrastructure monitoring. Features and functions like a web configuration interface, performance graphics, SNMP trap support, a mobile app, business process monitoring, custom maps, a database backend, integrated user interfaces, dashboards, planned reports, configuration assistant, reports for business management, bulk management and audit logging are not included in the free package. PRTG on the other hand comes with all these features and then some more and is fully equipped with all available sensors. These sensors are immediately integrated and are easy to use via the web administration interface. Of course, Nagios uses something like sensors or agents as well but they are not all immediately available – the administrator has to find out what is available on the Nagios Exchange website, for example, and download and integrate them in the form of add-ons or plug-ins. Configuration of a suitable collection for a company and the related setup can take up a significant amount of time.

Speaking of setup: I've already discussed how easy the setup for PRTG is and how complicated Nagios can be – PRTG takes the lead not only for installation and the startup configuration but also for configuration changes, user management and report creation. If no assistant is available for a certain configuration, changes can always be made directly in the graphical interface while in Nagios Core, even simple things like adding a new user demands an excursion into the Linux operating system level. Sovereign usage of Nagios Core is impossible without advanced Linux know-how.

A world of difference lies between the graphical user interfaces of the two products: on one side a fast, modern, complete and optically pleasing interface – on the other a rather archaic, rudimentary interface. Both, however, are fast.

Despite my love for open source software, I have no choice but to name PRTG Network Monitor as the clear winner of this comparison. I think that even if I would use the 2500-sensor version of PRTG for 3500 Euros, PRTG would still end up less expensive than Nagios Core as the costs for the Nagios solution are incurred during operation instead of acquirement. Anyway, anyone who wants to even come close to PRTG's functionality would have to invest in Nagios-XI, which starts out at around $2000 for 100 hosts.

Dirk Jarzyna,
funkschau editor

Features

Feature	Nagios Core	PRTG Network Monitor
Platform	Linux/Unix	Windows
User-defined Customization	N	Y
Monitoring Engine	Yes, open source	Y
Complete Infrastructure Monitoring	Y	Y
Quickstart Guides	On Website	Y
Web Configuration Interface	N	Y
Performance Graphics	N	Y
SNMP Trap Support	N	Y
Mobile App	N	Y
Business Process Monitoring	N	Y
Custom Maps	N	Y
Database Backend	N	Y
Integrated UI	N	Y
Dashboards	N	Y
Configuration Assistant	N	Y
Planned Reports	N	Y
Report Export	N	Y
Bulk Management	N	Y
Forum Support	Y	Y
Professional Email Support	optional, with costs	Y