



DREAMLAB
TECHNOLOGIES

Quotation: **Monitoring system for iproxy-project**

Quoted for: Gamma International GmbH

Gamma International GmbH
Mr. Thomas Fischer
Baierbrunnerstr. 15
D-81379 Munich

Bern, 21. Dezember 2010

Quotation: Monitoring system for iproxy-project

Quotation number: 3104488

Dear Mr. Fischer

Thank you for your interest in our services.

We are pleased to submit the following quotation concerning the Monitoring system for iproxy-project.

The quotation shows a summary of the actions planned and lists the costs for every step.

If you have any further questions or comments concerning this quotation, do not hesitate to call us.

We are looking forward to support you in this project.

Yours sincerely,

Nicolas Mayencourt
CEO
Dreamlab Technologies AG

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1. Fundamentals

This offer is based upon a request of Thomas Fischer of Gamma International as well as on various conversations between Gamma International, Dreamlab Technologies AG and the end customer.

1.1 Starting point and objectives

During the integration tests in Oman in September 2010 the end customer figured out that not all of the components of the iproxy infrastructure are under their full control. It is, for example possible that changes of the Oman-network may occur without their knowledge. Thus, it might occur that ISPs may modify some of the current configuration. Therefore, the question arose whether it is possible to identify such a modification in the network setup by monitoring the whole iproxy infrastructure.

From this point of view, a request for an efficient and user-friendly monitoring of the iproxy infrastructure including all components of the systems was derived. This requirement is discussed and a proposal for solution is described in this offer.

The solution covers several aspects:

- All components of the iproxy infrastructure and all services running on the systems will be monitored.
- For defined critical outages of the hardware components, processes and/or services the system will send SMS- and/or e-mail-alarms to persons defined beforehand.
- A web-based management GUI offers a wide range of views, which allow the operators to easily identify system issues and outages.
- A set of reports offers possibilities to retrieve condensed information on the system like statistics on outages or performance problems.

2. Qualifications of Dreamlab

Since 1998, Dreamlab Technologies AG supports economical, governmental and educational institutions and organizations. Our main activities are strategical consulting and education as well as conception, realization, integration, operation and maintenance of IT solutions based on open standards.

Since 2003, Dreamlab officially represents the Institute for Security and Open Methodologies (ISECOM) in Switzerland, France and Germany. ISECOM is an international non-profit organization that develops open standards for IT security and business integrity testing. It is the editor of the Open Source Security Testing Methodology Manual (OSSTMM), the most widely spread standard for information security testing. Nicolas Mayencourt, CEO of Dreamlab Technologies, is a member of the board of directors of ISECOM and presides its units "Business Development" and "Academic Alliance".

Dreamlab is the only education partner of ISECOM in Switzerland, France and Germany and it offers OSSTMM certification courses for security professionals in collaboration with ISECOM and an international network of partner organizations and universities. In cooperation with the University of Applied Science of Berne, Dreamlab launches Switzerland's first OSSTMM certification courses. Dreamlab also provides a Hacker Highschool to help young people to become aware of responsible handling of IT technologies.

Through close partnership with ISECOM and an active collaboration in setting new standards, Dreamlab is always up-to-date and even ahead of the times. Being a honorary member of the security section of the Swiss Informatics Society, a member of the OpenTCPA Research Group and of the World Wide Web Consortium (W3C) means being part of the newest developments in IT security. Within W3C, Dreamlab is responsible for the Xforms Standard and is an active part of other working groups (e.g. HTML) to integrate security knowledge into processes of creation and maintenance of future standards. Customers of Dreamlab directly benefit from this body of knowledge, from the contact network and from the insight into developments and future marketplaces.

The Dreamlab staff consists of skilled OSSTMM professionals who constantly observe the security branch and have access to the latest developments and trends. To be able to advise their customers the best, they exchange knowledge at the most important international IT security conferences and keep on educating themselves continually.

Since 2005, Dreamlab has developed a software suite for lawful interception and data retention and has successfully implemented the solution with various Swiss and international customers. The Dreamlab LI-SW-Suite is unique with regards to security, performance, flexibility and price on the market. The software components are under permanent development, are compliant with the common ETSI-standard and cover most of the interception requirements on all relevant technologies of IP networks.

3. Project workflow and deliverables

3.1 Overview of the actual iproxy infrastructure

3.1.1 Network infrastructure for the iproxy infrastructure

In 2010, the infection proxy solution for the fixnet part was implemented on-site in Oman. The picture below shows the network infrastructure and the setup as currently implemented.

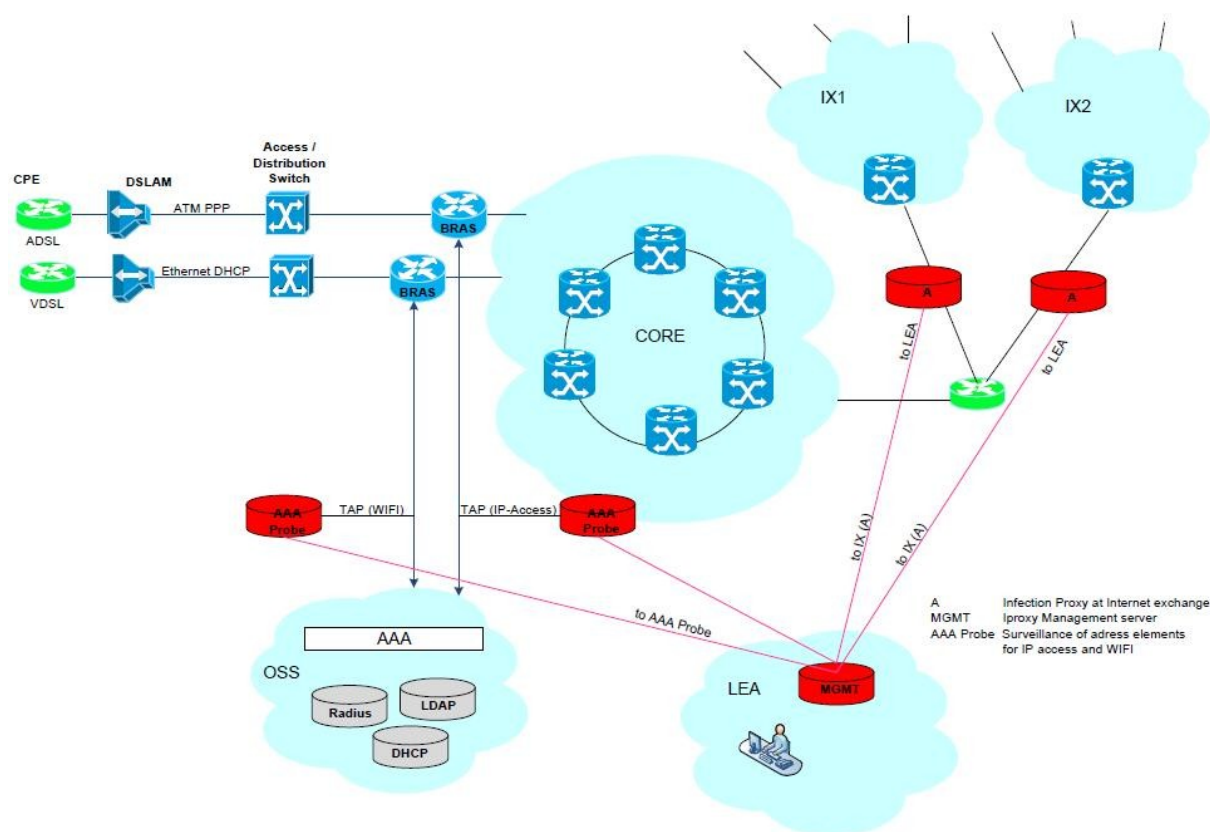


Illustration 1: Current topology of the network with infection proxies

During the tests in Oman, the end customer asked for a monitoring possibility of the iproxy infrastructure with the goal to identify changes and modifications of the setup.

The following quotation specifies the elements of the proposed monitoring system.

3.3 Functional overview of the monitoring solution

The proposed monitoring solution is based on Nagios-Munin, *the* state-of-the-art monitoring software.

Components to be monitored

The following system components of the iproxy infrastructure are subject to monitoring (see picture 2 on page 8):

- the management server at the LEA (ADMF)
- the 2 AAA-probes for the IP-access and WIFI
- the 2 iproxies at the internet exchange

For the named components the monitoring system will be configured with agents to monitor several layers (see Picture 3 below):

Hardware Layer Monitoring: Important hardware components will be monitored like disks, CPUs, raid-controller, power (on/off) or network cards, plugging / unplugging of cables. For these elements checks will be made in order to control the hardware condition .

System Layer Monitoring: System processes are monitored and important data and aspects like disc capacity, RAM capacity, CPU performance etc. will be checked. Errors and system critical values (for example: disc capacity over 80% etc.) are detected. Regular alive-checks are done.

Application Layer Monitoring: An overall process check on each machine gives important information on the overall condition of the monitored element.

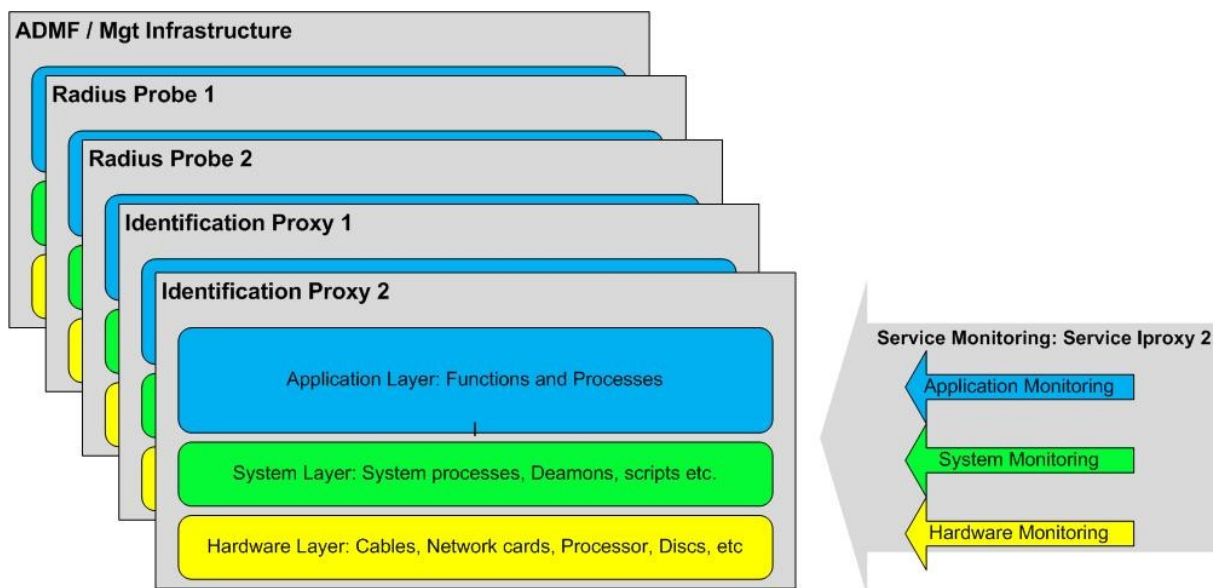


Illustration 3: The proposed monitoring consists of several levels. On the lower levels hardware components, system and application processes are monitored. On a higher level services (like iProxy 2) are monitored. Detailed presentations of the graphical user interface are shown in appendix in ch. 10, p. 23ff.

However, smart monitoring does include more than monitoring all the components. Only when combining and understanding the components as a whole service the results of a monitoring are good results. Thus, the monitoring is service-oriented where the components and its dependencies are included.

In our proposal we introduce two higher layers of services, while the first reflects “a site” (for example the NDP1). Thus, it is possible to easily drill down information concerning site “NDP1” or site “management infrastructure (ADMF)” and hence, to identify in the monitoring whether the service of site “NDP1” is correctly working or not.

On the highest level, dependencies between the sites are introduced to build a view of the whole service. In order to introduce this view related to monitoring, deep insight in the real implementation of a service is needed. As a result, the user gets qualified information about the service level of the monitored service, thus, reaching a level where monitoring is intuitively understood – also by non-application specialists.

Alerting and alarming

The monitoring system allows to set up alerts on nearly any kind of event. Typical alerts are outages of hardware components, exceeding of critical values like disc space usage, timeouts etc. Based on alerts, alarming mechanisms can be used to send an alarm by email or SMS to persons defined beforehand.

Example for an alarm: assuming a network cable is unplugged at NDP1. The monitoring system triggers an alarm set up beforehand, which alerts the person in charge at LEA (for example by SMS or Mail).

Views (for details also see the appendix on page 23)

The monitoring system will offer a set of views, which show the aspects of the monitoring system as described in the previous section, and which are helpful when analysing problems, alerts and outages. Detailed examples and short descriptions of the views are shown in the appendix on page 23ff.

| View | Short description |
|--------------------|--|
| Tactical view | The tactical overview always shows all service and host checks that are performed and gives an overview of the condition of the whole system and its corresponding services. The monitoring platform is service-aware and knows which services depend on what underlying systems. In case of outages or problems, this screen directly indicates the elements that need treatment. |
| Service details | The service overview pane dissects the rendered services in its components. Each component is actively monitored and in case of failure, the operator knows exactly, which element is causing the issue. |
| Host details | The host details pane shows all hosts participating in the system and its condition. From this screen the operator can drill in the detailed checks and their corresponding history. |
| Host group summary | Modern services usually need more than one host to be rendered correctly. In the host group pane the operator is shown the logical function blocks including its real |

| View | Short description |
|-----------------------------------|--|
| | time monitored condition, which is typically used for first line diagnosis of problems or anomalies. |
| Status host map | The host map shows the measured state in a topological manner. |
| Extended host process information | This detailed screen shows the specific monitoring configuration on a per-host-basis. |
| Trend host view | With the trending tool the overall availability and availability trends are being calculated in a format, which delivers the perfect basis to calculate SLA aspects. |
| Trend service view | This example shows service outages on a timeline. Perfect for reconstructing events or managing outages. |
| Service availability | This feature of the monitoring platform calculates on a per-host-basis the detailed service availabilities in a defined timespan. |
| Overview | With the Nagvis extension the whole monitoring infrastructure can be combined with informal layouts and graphs. This tool is of great value and helps visualising the very low-level technical measurements by transforming them into very informative and high-level views enabling the operator to quickly identify potential problems. |
| Map overview | Combining multiple views and graphs leads to considerably reduced debugging times. From the very high level layouts, the operator can access the rack view and therefore see, where problems need treatment on a physical layer. |
| Site Overview | This is another example of a very high-level and highly condensed system view. Bear in mind that the informal layouts get enhanced by the various real time checks, which, when correlated and condensed, lead to one working or not working statement per logical unit. |
| Virtualized system overview | With this monitoring platform, even virtualised systems can be dissected and shown in informal graphs. |
| System detail overview | This example shows all actual performance consumptions on all systems on one single page. |
| Screen overview | With the additional performance graphs, every measurement is shown in detail in tie series plots. Operators therefore get a very detailed view of every single aspect of a service and host. With means of the time series and the operational knowledge the operators get a very detailed insight on any impact from any service providing the systems. |

3.4 Project management

The project management must be assigned to project planning, communication, and co-ordination; this will ease the handling of all tasks that arise, such as in particular the co-ordination and communication within the teams, co-ordination of on-site work, collaboration with the parties involved, ordering and monitoring of duties to co-operate, guaranteeing of the provision of any existing dependencies, hardware assembly, factory testing, the provision of all project-related documentation such as system and instruction manuals.

3.5 Devices and infrastructure

Before the on-site installation, the hardware will be assembled, equipped and preconfigured with all software components at Dreamlab Technologies. Additionally, a detailed test will be accomplished before shipping. The systems are, as a matter of principle, delivered to the desired address ready-to-use. Dreamlab will deliver the following hardware and software components for the project:

Monitoring server cluster

The monitoring system will run on a HP DL 380 G7 server cluster. The servers must have internet access and access to the GSM network in order to send e-mails and SMS. In order to grant a very high monitoring service level, the monitoring system runs as a redundant cluster system. The monitoring servers are setup in a hotstandby-mode with heartbeat and a mirroring of the harddiscs. The Nagios and Munin platforms have to be clustered and configured accordingly.

Software components

The monitoring system is based on the Nagios system. The monitoring server will contain the following elements:

Server software setup

- Nagios platform
- Munin platform
- Nagvis visualisation platform

The installation contains the setup of the Nagios platform, the Munin platform and the Nagvis visualisation platform, as well as the following configurations:

- Webserver / web interface configuration
- Nagios Server configuration
- Munin Server configuration
- Nagvis visualisation server configuration

Client agent software setup

- Installation and preconfiguration of the Nagios agents on to the client systems (see overview picture Illustration 2 on page 8)
- Installation and preconfiguration of the Munin agents on to the Client systems (see illustration 2 on page 8)
-

Customized client agent checks

- Writing customized Nagios agent checks
- Writing customized Munin agent checks

Alerting

- Installation / configuration SMS / Mail alerting functionality

Testing

- Nagios server functional tests
- Munin server functional tests
- The infrastructure will be assembled, configured and subjected to a detailed burn-in test at Dreamlab

3.6 On-Site installation, integration to existing infrastructure and tests in Oman

The monitoring system will be finally configured and tested in Oman in accordance with the needs of the end customer.

Client agent software setup

- On-site Installation and final configuration of the Nagios agents on to the client systems (see illustration 2 on page 8)
- On-Site installation and final configuration of the Munin agents on to the client systems (see illustration 2 on page 8)

Alerting

- Installation / configuration SMS / mail alerting functionality in accordance with the needs of the end customer

Testing and fine tuning

- Nagios server on-site integration tests
- Munin server on-site integration tests

Customizing for the client

- Alerting and monitoring infrastructure adjusting to the clients wish

3.7 Training

Persons responsible will receive system training, including all necessary training documentation adapted for the client system in English.

3.8 System care

Support and maintenance covers all activities in support of the client operating with the installed systems in case service is needed.

3.9 On-site maintenance in Oman

The SLA can be fulfilled without remote access and in the scope of an annual visit at the client's location, during which, updates and tests can be carried out or open questions can be discussed with the customer. This can occur every year, every semester, or every quarter of the year. Since this is very much a security-related and sensitive infrastructure, which is located in a public network, Dreamlab advises that the maintenance work will be undertaken as frequently as possible (every quarter of the year, if possible).

3.10 Co-ordination Meetings

In addition to the system maintenance, a co-ordination meeting with the client takes place on-site once a year, during which the needs and requirements of the client can be discussed and where relevant information, news and current trends can be exchanged on a management level.

4. Terms and conditions

This quotation is valuable within the following limitations. The conditions listed below must be granted by Gamma International GmbH (in the following: client).

- I. The client will not claim any requirements concerning possible damage or harm connected to operations performed by the staff of Dreamlab Technologies apart from harms or damages due to carelessly or purposely wrong performed or neglect actions.
- II. The client will forego all assertion of claims on account of any possible adverse effects and/or damages that may arise in connection with the assignment. Reserved are damages that arise through serious negligence or deliberate actions or omissions by the staff of Dreamlab Technologies.
- III. The current approach for monitoring covers the actually implemented infection proxy system of Oman as delivered in PO-Nr: 3104256.1 ("Infection Proxy Project")
- IV. The management server cluster of the monitoring system must have Internet access and the ability to send SMS.
- V. The site where the monitoring servers are placed, must have GSM-coverage in good quality. Alternatively, a GSM-antenna must be placed, the signal must be received the server room.
- VI. The ISPs must provide a layer 2 ethernet network with sufficient bandwidth (at least 10mb/s) and guarantee a low latency from the LEA/LEMF to the infection proxy centres.
- VII. The networks used must be configured the way an IP-connection exists from the management server to the radius probes and the infection proxies. The infection proxies must be connected with the radius probes in the same way.
- VIII. If during the course of the on-site installations some of the above named preconditions and limitations should not be fulfilled, Dreamlab Technologies AG reserves the right to treat the work linked to such missing preconditions as change requests to this offer, which have to be paid. Based on time and material needed in addition.

Please do precisely document any additional information, differences, amendments or comments.

5. Obligation to cooperate

We assume Gamma International GmbHs (in the following: Client) cooperation and support of the project to cover the following points:

- I. The client will make available document templates and information necessary for the execution of the work.
- II. The client will inform parties involved in the project about the upcoming work.
- III. The client will organise all necessary information, accesses and entries that are required for the workflow of the project.
- IV. The client will organise meetings and establish contact with the parties involved.
- V. The client will make available the network connections and the network between the servers and the sites.
- VI. The client will make available sufficient network connections for the delivered components.
- VII. The client will make available housing space for the delivered turn-key solutions (Racks, UPS, cooling).
- VIII. The client will organise the transport of staff and material.
- IX. The client will organise all additional test equipment for the FAT / E2E tests.
- X. The client needs to prepare Internet access, which is needed for the monitoring system to run. The monitoring system must be able to send mails, thus an e-mail address is needed for the monitoring system too.
- XI. Two Sim-cards for access to the GSM-network in Oman have to be provided by the end-customer.
- XII. Rackspace is needed at the LEA.
- XIII.2 Network ports per server and a crosslink (minimum 1 Gbit) between both are needed for the monitoring system.
- XIV. A laptop with a mail account and a mobile phone are needed to test the monitoring solution.

6. Costs

Quotation number: 3104488

6.1 Services provided by Dreamlab Technologies

| Item | Description | Unit Price | Number | Net Value CHF |
|--------------|--|------------|---------|------------------|
| 001 | Project management and documentation Project Management for the co-ordination of all work that arises, production of all project-related documentation | 1'600.00 | 8 days | 12'800.00 |
| 002 | On site assembly, installation and test in Oman All the equipment will be assembled, the system will be preconfigured and shipped to Oman. The system will be thoroughly tested and handed over to the client. | 1'440.00 | 15 days | 21'600.00 |
| 003 | Option: Configuration and for redundant system The monitoring solution will be configured and tested as redundant cluster at Dreamlab | 1'440.00 | 4 days | 5'760.00 |
| 004 | Training Persons responsible will receive system training, including all necessary documentation adapted for the client system in English (2 days on-site, 1 day for preparation) | 1'800.00 | 3 days | 5'400.00 |
| Total | Services provided by Dreamlab Technologies | | | 45'560.00 |

Prices do not include VAT and shipping and are in CHF.

6.2 Monitoring and alarming system

| Position | Description | Unit price | Number | Net worth CHF |
|--------------|---|------------|--------|------------------|
| 001 | HP DL 380 Generation 7 (G7) With 6x 146GB SAS HDs, 6x2GB PC3-RAM, DVD, Red. PS. ILO.Package (With guarantee extension for 5 years) | 16'955.00 | 1 | 16'955.00 |
| 002 | Nagios Munin Installation Dreamlab monitoring centre Server software setup <ul style="list-style-type: none"> • Installation of Nagios platform • Installation of Munin platform • Installation of Nagvis visualisation platform • Webserver / web interface configuration • Nagios server configuration • Nagvis visualisation server configuration • Munin server configuration Client agent software setup <ul style="list-style-type: none"> • Installation and configuration of the Nagios agents on to the client system • Installation and configuration of the Munin agents on to the Client system Customized client agent checks <ul style="list-style-type: none"> • Writing customized Nagios agent checks • Writing customized Munin agent checks Alerting <ul style="list-style-type: none"> • Installation / configuration SMS / mail alerting functionality Testing and fine tuning <ul style="list-style-type: none"> • Nagios server integration and functional tests • Munin server integration and functional tests • The infrastructure will be assembled, configured, and subjected to a detailed burn-in test at Dreamlab Customizing for the client <ul style="list-style-type: none"> • Alerting and monitoring infrastructure adjusting to its clients wish | 60'000.00 | 1 | 60'000.00 |
| 003 | GSM modem alarming path | 1'000.00 | 1 | 1'000.00 |
| 004 | Customising of alerting rules | 1'800.00 | 3 | 5'400.00 |
| Total | Monitoring and alarming option | | | 83'355.00 |

Prices without VAT and in CHF.

6.3 Redundant monitoring and alarming

| Position | Description | Unit price | Number | Net worth CHF |
|--------------|--|------------|--------|------------------|
| 001 | HP DL 380 Generation 7 (G7) Redundant Server with 3x 146GB SAS HDs, 6x2GB PC3-RAM, DVD, Red. PS. ILO.Package (With guarantee extension for 5 years) | 16'955.00 | 1 | 16'955.00 |
| 002 | Nagios Munin Installation Dreamlab monitoring centre Setup, customising and testing in accordance with Position 002 of chapter 6.2 for the redundancy system | 40'000.00 | 1 | 40'000.00 |
| 003 | GSM modem alarming path | 1'000.00 | 1 | 1'000.00 |
| Total | Redundant monitoring and alarming | | | 57'955.00 |

Prices without VAT and in CHF.

6.4 System maintenance (on-site) per call-out

| Item | Description | Unit Price | Number | Net Value CHF |
|--------------|---|------------|--------|-----------------|
| 001 | On-site system maintenance Loading of updates, system tests, troubleshooting, depending on client's wishes up to four times a year (5 days per call-out). We recommend at least two visits (better four) on-site for system maintenance per year. | 1'600.00 | 5 days | 8'000.00 |
| Total | System maintenance/per call-out (on-site variant) | | | 8'000.00 |

Prices do not include VAT and shipping and are in CHF.

6.5 On-site co-ordination meetings per call-out

| Item | Description | Unit Price | Number | Net Value CHF |
|--------------|---|------------|--------|-----------------|
| 001 | Co-ordination Meetings Annual co-ordination meeting with the client, including exchange of information at management level, depending on client's wishes up to four times a year (3 days per call-out). We recommend at least 2 visits on-site for coordination meetings per year. | 1'800.00 | 1 days | 1'800.00 |
| Total | Co-ordination meetings per call-out | | | 1'800.00 |

Prices do not include VAT and shipping and are in CHF.

6.6 System maintenance for redundant system (on-site) per call-out

| Item | Description | Unit Price | Number | Net Value CHF |
|--------------|--|------------|--------|------------------|
| 001 | On-site system maintenance Loading of updates, system tests, troubleshooting, depending on client's wishes up to four times a year (5 days per call-out) | 1'600.00 | 2 days | 3'200.00 |
| Total | System Maintenance/per call-out (on-site variant) | | | 1'600.00 |

Prices do not include VAT and shipping and are in CHF.

6.7 Solution maintenance

The annual solution maintenance ensures that the solution built for the customer is permanently maintained and that a solution test environment is held and maintained at the Dreamlab offices in Berne.

| Item | Description | Unit Price | Number | Net Value CHF |
|--------------|--|------------|--------|------------------|
| 001 | Monitoring solution for the iproxy infrastructure | 24'000.00 | 1 | 24'000.00 |
| 003 | Option: Cluster extension of monitoring solution | 12'000.00 | 1 | 12'000.00 |
| Total | Annual solution maintenance | | | 36'000.00 |

Prices do not include VAT and shipping and are in CHF.

7. Order for quotation no. 3104488

Subscription details „Monitoring system for iproxy-project“

| | Description | Net worth CHF |
|-----------------------------|--|---------------|
| | Monitoring and alarming | 83'355.00 |
| | Services provided by Dreamlab | 34'400.00 |
| | Training | 5'400.00 |
| | Annual solution maintenance | 24'000.00 |
| Option redundant monitoring | | |
| | Redundant monitoring implmentation | 57'955.00 |
| | Services provided by Dreamlab for redundancy | 5'760.00 |
| | Annual solution maintenance for redundant system | 12'000.00 |

Please tick.

Subscription details: Recurring charges

| | Description | Unit Price | Nr. of c-o | Net worth CHF |
|--|---|------------|------------|---------------|
| | System maintenance per call-out | 8'000.00 | | |
| | On-Site coordination p. call-out | 1'800.00 | | |
| | Option: Redundant system System maintenance per call-out | 3'200.00 | | |

Please tick and give the total number of call-outs requested per year.

Conditions

Prices

All prices are in CHF without VAT.

Expenses

Travel expenses within Switzerland are included in the offer.

Payment Conditions

30% down payment, 30% at time of delivery, 20% after installation and 20% after the final acceptance of the end user/customer, in accordance with the co-operation agreement.

Deadlines

Deadlines are yet to define exactly.

Validity of this quotation

This quotation is valid for 4 weeks, starting from the date of issue.

Acceptance of general terms and conditions and obligation to cooperate.

| Locality | Date | Person responsible Gamma International GmbH |
|----------|------|---|
| | | Name: |
| | | Signature: |

8. Conditions

8.1 Prices

All prices are in CHF without VAT (MwSt.).

8.2 Expenses

Travel expenses within Switzerland are included in the offer.

8.3 Payment Conditions

30% down payment, 30% at time of delivery, 20% after installation, and 20% after the final acceptance of the end-user/customer, in accordance with the co-operation agreement.

8.4 Deadlines

Deadlines are yet to define exactly.

8.5 Validity of this quotation

This quotation is valid for 4 weeks, starting from the date of issue.

8.6 Attachment

General terms and conditions of business of Dreamlab Technologies AG.

9. Contact

9.1 Client

| | | |
|--------------------------|----------------------|---------------------|
| Gamma International GmbH | Address | Baierbrunnerstr. 15 |
| | Postal code and city | D-81379 Munich |
| Contact commercial | | |

| | | | |
|------------|---------------------------|--------|------------------|
| First name | Thomas | Name | Fischer |
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9.2 Service provider

| | | |
|--------------------------|--------------------------|--------------------|
| Dreamlab Technologies AG | Address | Monbijoustrasse 36 |
| | Postal code and locality | CH-3011 Bern |
| Contact commercial | | |

| | | | |
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| First name | Nicolas | Name | Mayencourt |
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| E-Mail | nicolas.mayencourt@dreamlab.net | | |

Contact technical

| | | | |
|------------|-------------------------|--------|------------------|
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| Function | | | |
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10. Attachment

10.1 Hardware infrastructure

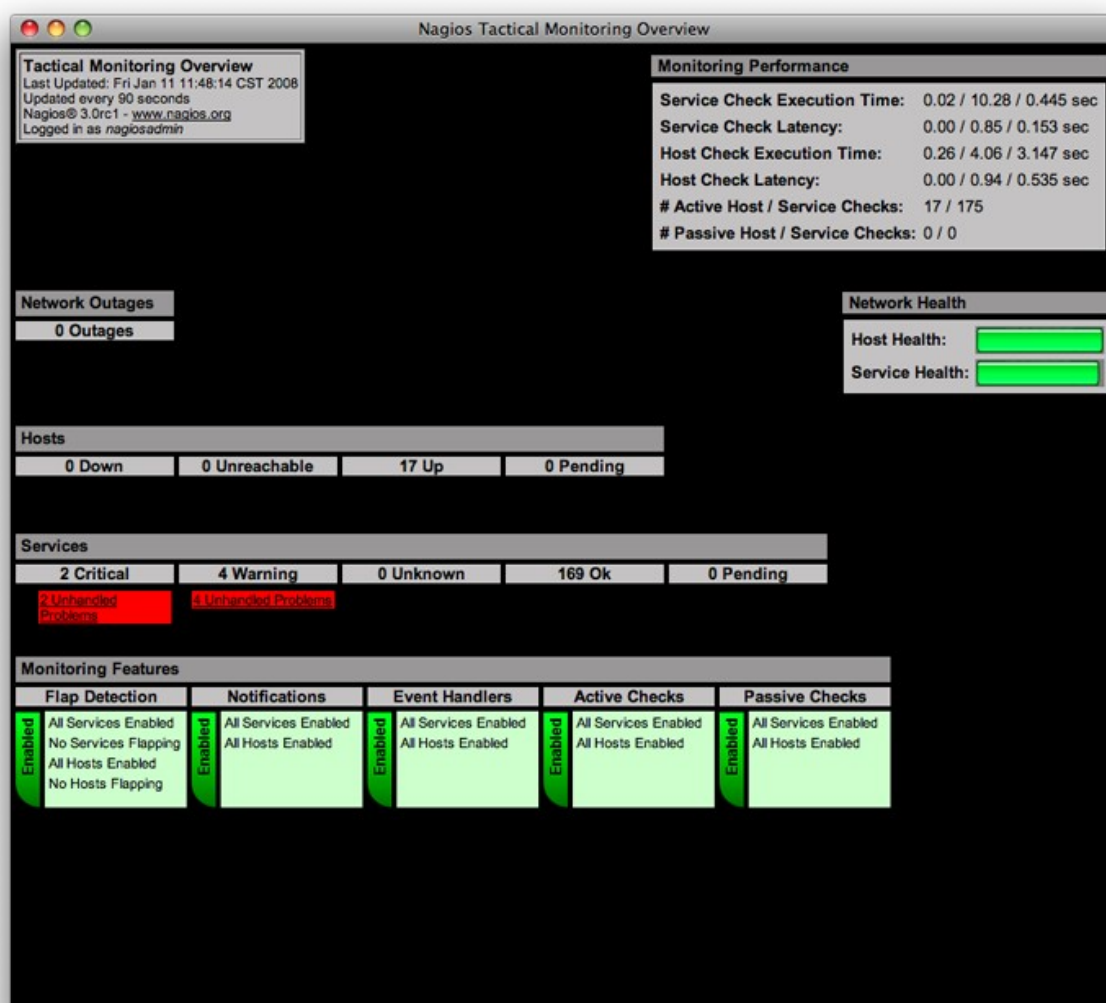
10.1.1 HP DL 380 Generation 7 (G7) with 3x 146GB HDs, DVD, Red. PS. ILO.



| | |
|--------------------|---|
| Processor | 2x Intel® Xeon® Processor X5650 (2.6 GHz, 8MB L3 Cache) six-core |
| Cache Memory | 8MB (1 x 8MB) Level 3 cache |
| Memory | 12 GB (6 x 2 GB) PC3-10600R (DDR3-1333) Registered DIMMs |
| Network Controller | Two BCM5709C with dual-port Gigabit Server Adapters |
| Storage Controller | HP Smart Array P410i/102MB with BBWC |
| Drives | HP Slim SATA DVD RW drive |
| Controller | Smart Array P410i Controller with Zero Memory (Raid 0/1/1+0) |
| Internal Storage | Standard: 8 SFF SAS/SATA HDD Bays Optional: 16 SFF SAS/SATA HDD Bays |
| Optical Drive | HP Slim SATA DVD RW drive |
| Power Supply | 2x 750W Hot Plug Power Supplies |
| Fans | 6x (N+1 redundancy standard) |
| Form Factor | Rack (2U), Height 3.38-inch (8.59 cm); Width: 17.25 (44.54 cm); Depth: 27.25 inches (69.98 cm) |
| Accessory | Without upgrade elements and rack mount kit |

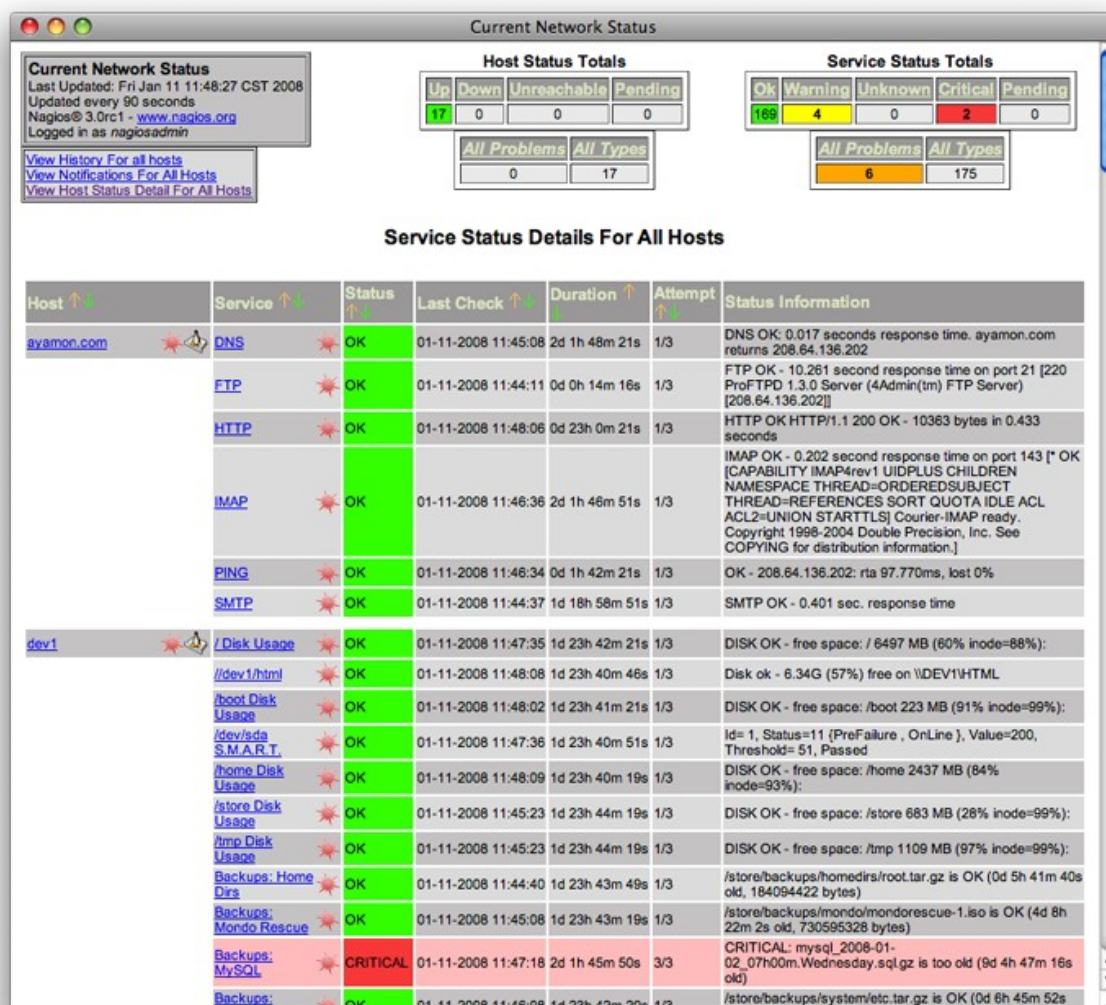
10.2 Alerting and monitoring infrastructure

10.2.1 Nagios Tactical Monitoring Overview



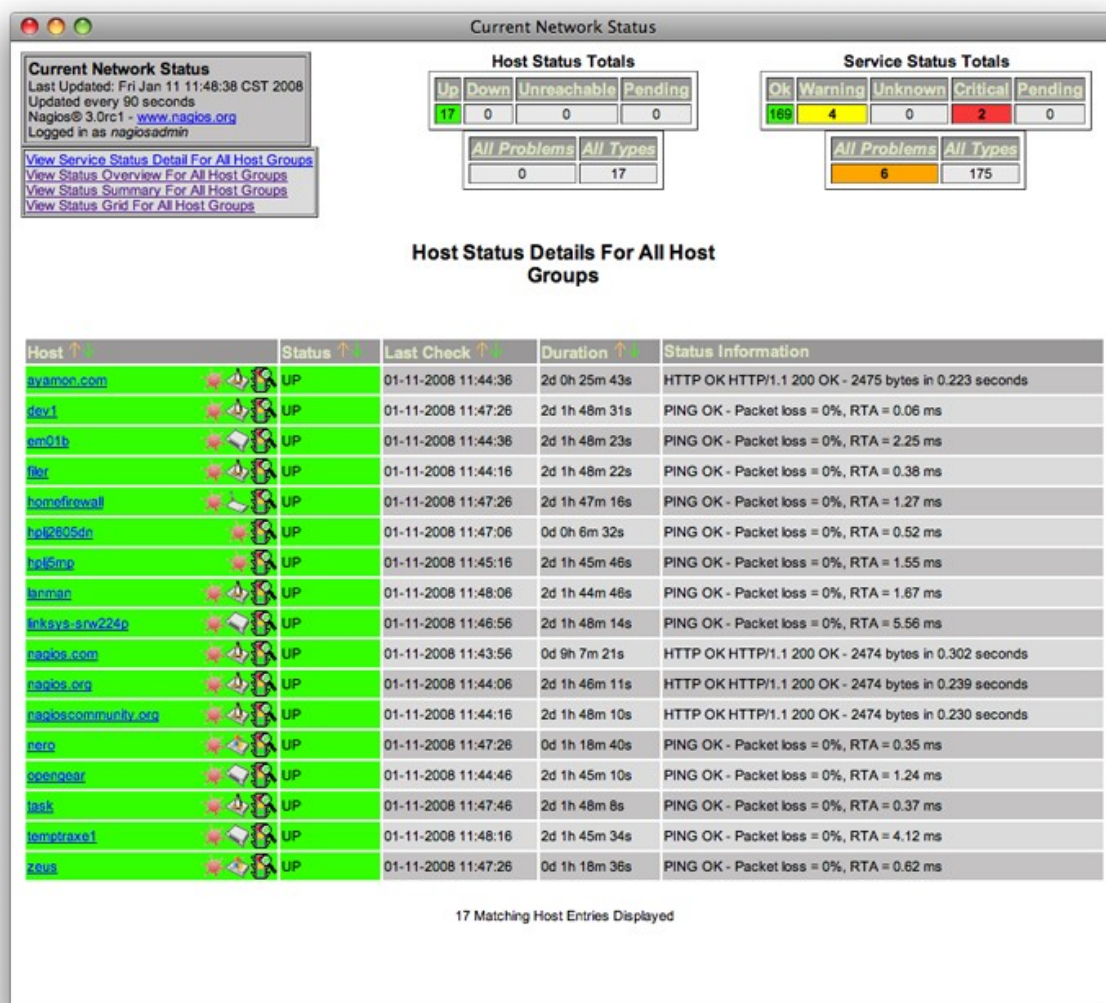
The tactical overview always shows all services and host checks that are performed and gives an overview of the condition of the whole system and its corresponding services. The monitoring platform is service-aware and knows which services depend on what underlying systems. In case of outages or problems this screen directly indicates the elements that need treatment.

10.2.2 Nagios Service Details



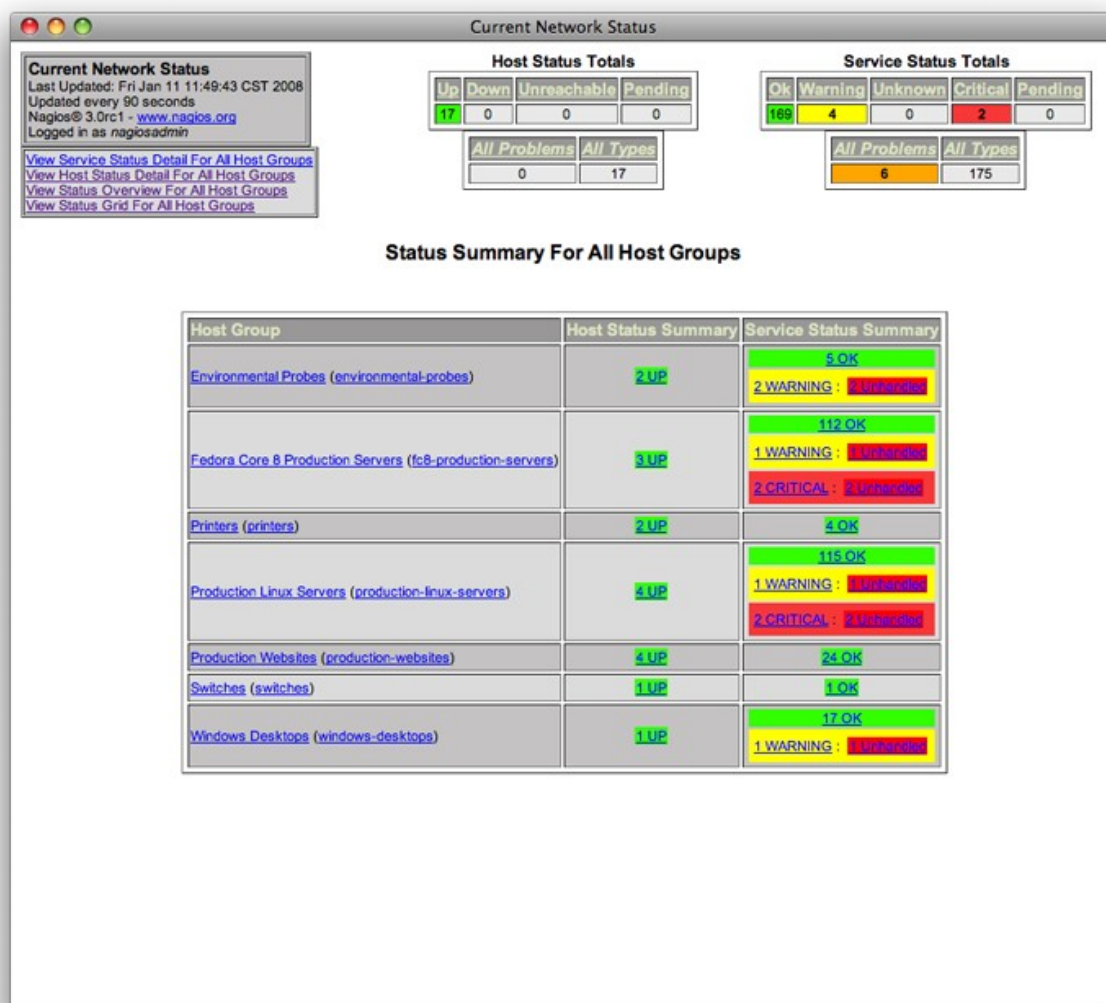
The service overview pane dissects the rendered services in its components. Each component is actively monitored and in case of failure the operator knows exactly, which element is causing issues. Of course, a history of all events is being kept.

10.2.3 Nagios Host Details



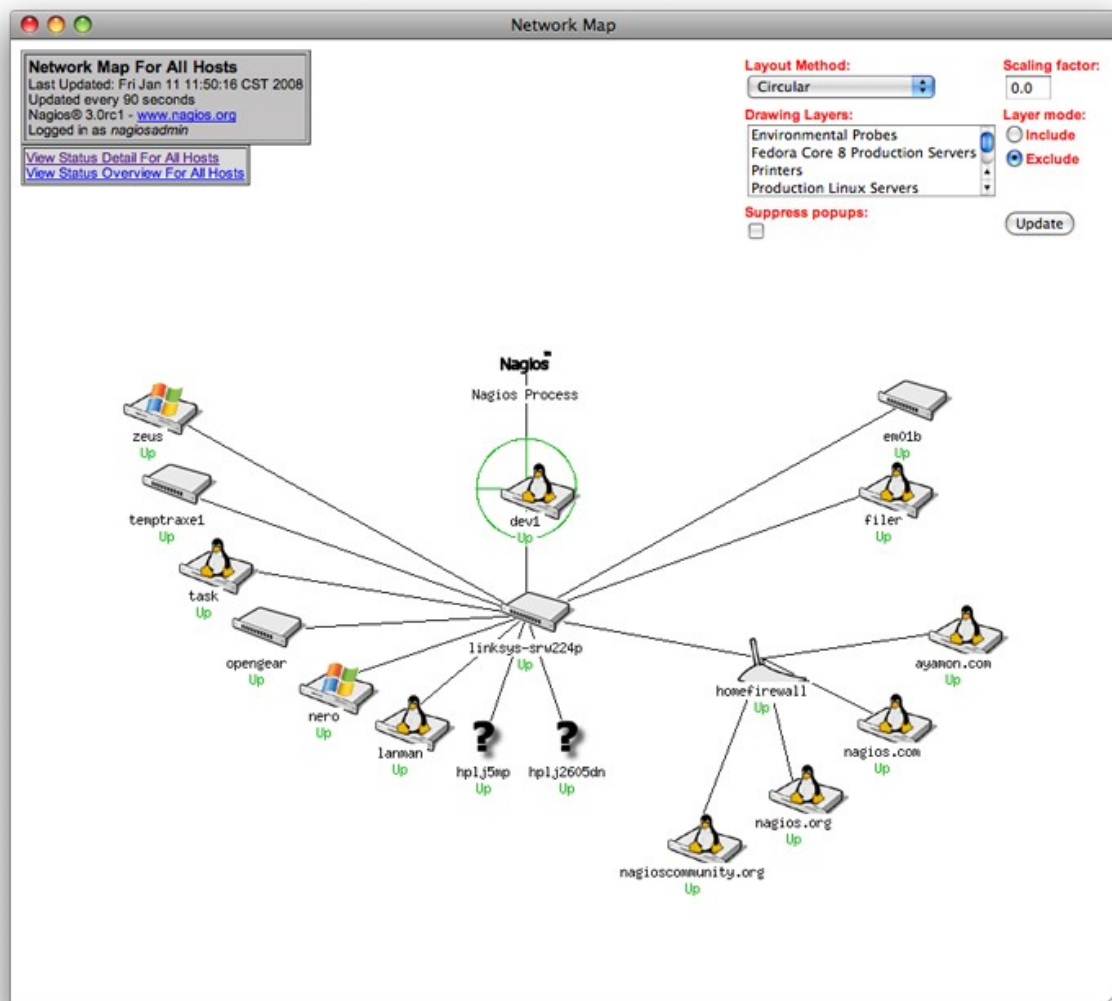
The host details pane shows all hosts participating in the system and its condition. From this screen the operator can drill in the detailed checks and their corresponding history.

10.2.4 Nagios Host Group Summary



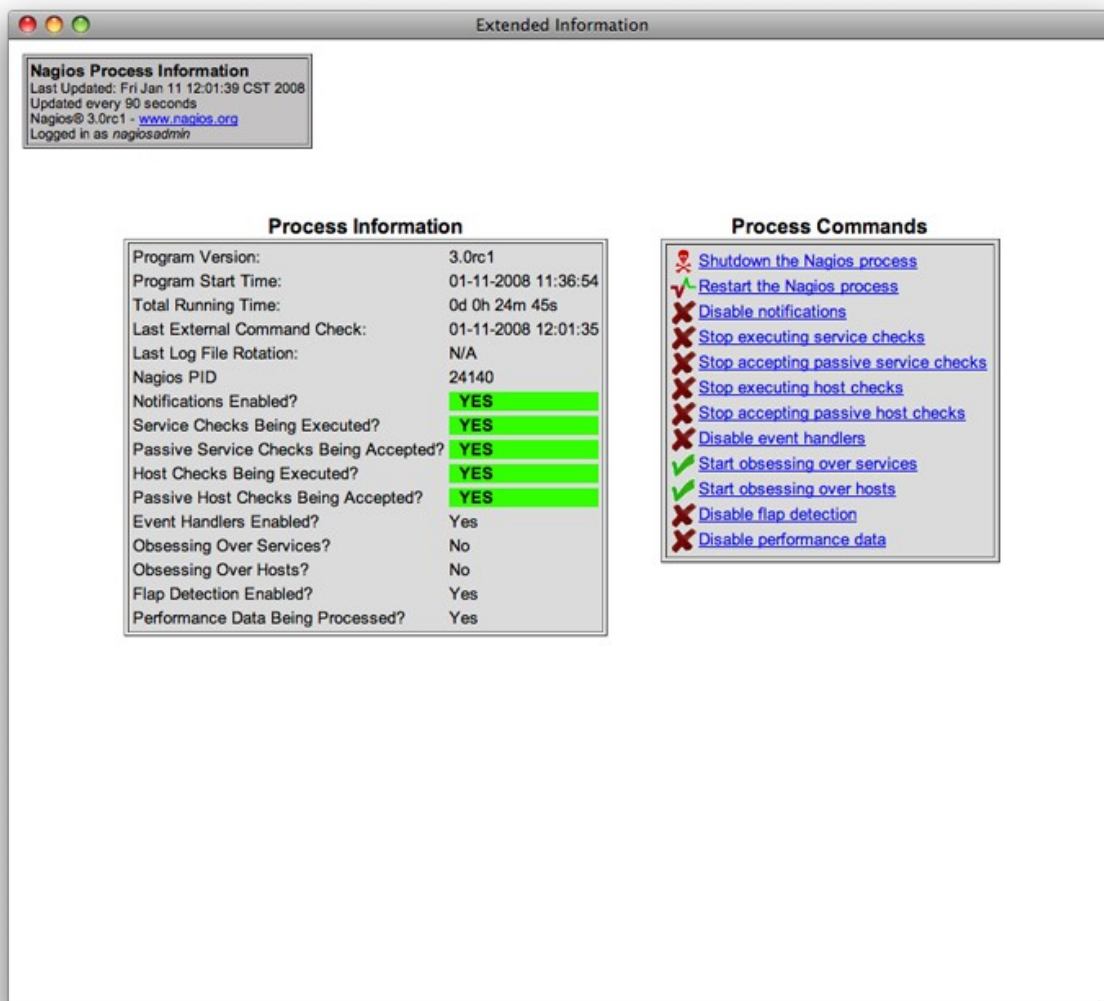
Modern services usually need more than one host to be rendered correctly. In the host group pane the operator is shown the logical function blocks including its real time monitored condition. This is a great tool for first line diagnosis of problems or anomalies.

10.2.5 Nagios Status Host Map



The host map shows the measured state in a topological manner.

10.2.6 Nagios Extended Host Process Information











The screenshot shows a web browser window titled "Extended Information". It contains two main sections: "Nagios Process Information" and "Process Commands".

Nagios Process Information

Last Updated: Fri Jan 11 12:01:39 CST 2008
Updated every 90 seconds
Nagios® 3.0rc1 - www.nagios.org
Logged in as nagiosadmin

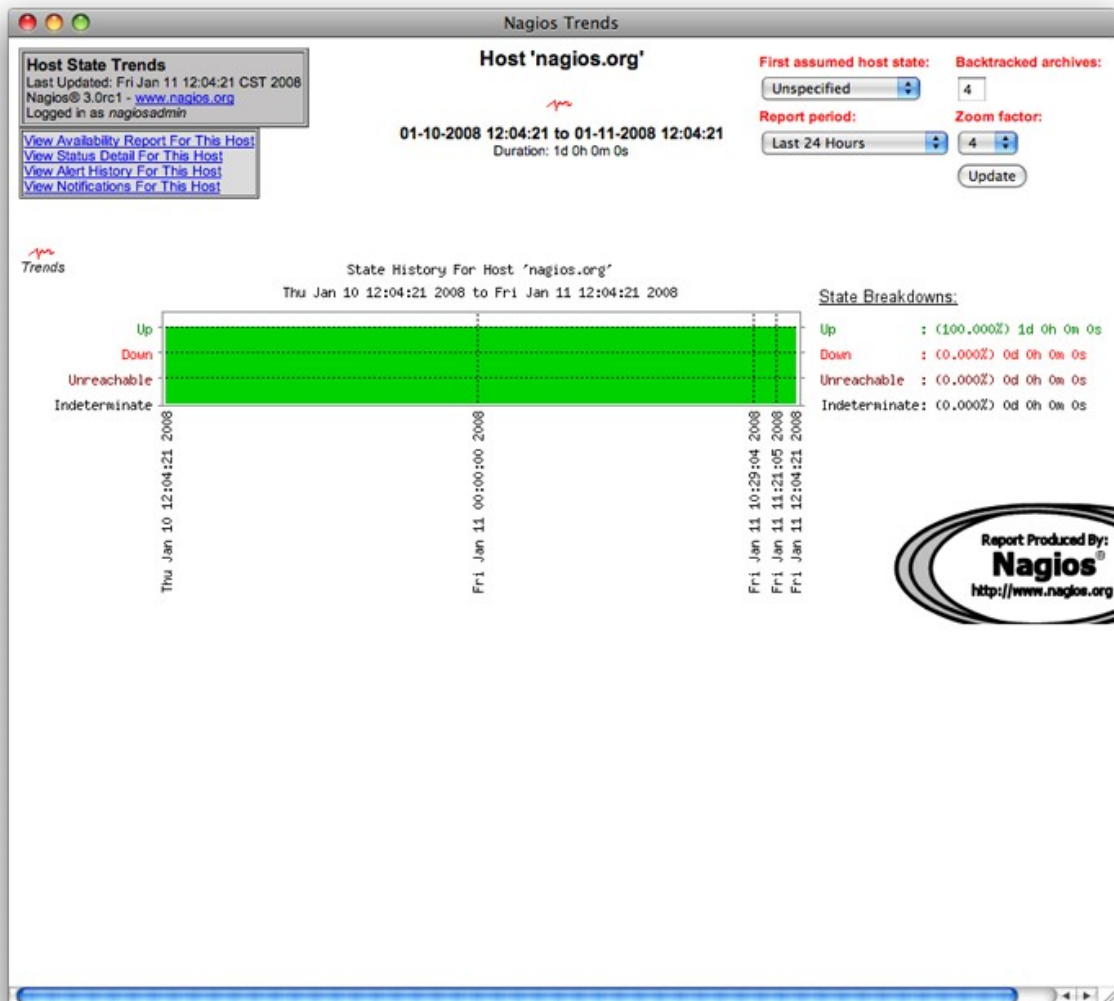
| Process Information | |
|--|---------------------|
| Program Version: | 3.0rc1 |
| Program Start Time: | 01-11-2008 11:36:54 |
| Total Running Time: | 0d 0h 24m 45s |
| Last External Command Check: | 01-11-2008 12:01:35 |
| Last Log File Rotation: | N/A |
| Nagios PID | 24140 |
| Notifications Enabled? | YES |
| Service Checks Being Executed? | YES |
| Passive Service Checks Being Accepted? | YES |
| Host Checks Being Executed? | YES |
| Passive Host Checks Being Accepted? | YES |
| Event Handlers Enabled? | Yes |
| Obsessing Over Services? | No |
| Obsessing Over Hosts? | No |
| Flap Detection Enabled? | Yes |
| Performance Data Being Processed? | Yes |

Process Commands

-  [Shutdown the Nagios process](#)
-  [Restart the Nagios process](#)
-  [Disable notifications](#)
-  [Stop executing service checks](#)
-  [Stop accepting passive service checks](#)
-  [Stop executing host checks](#)
-  [Stop accepting passive host checks](#)
-  [Disable event handlers](#)
-  [Start obsessing over services](#)
-  [Start obsessing over hosts](#)
-  [Disable flap detection](#)
-  [Disable performance data](#)

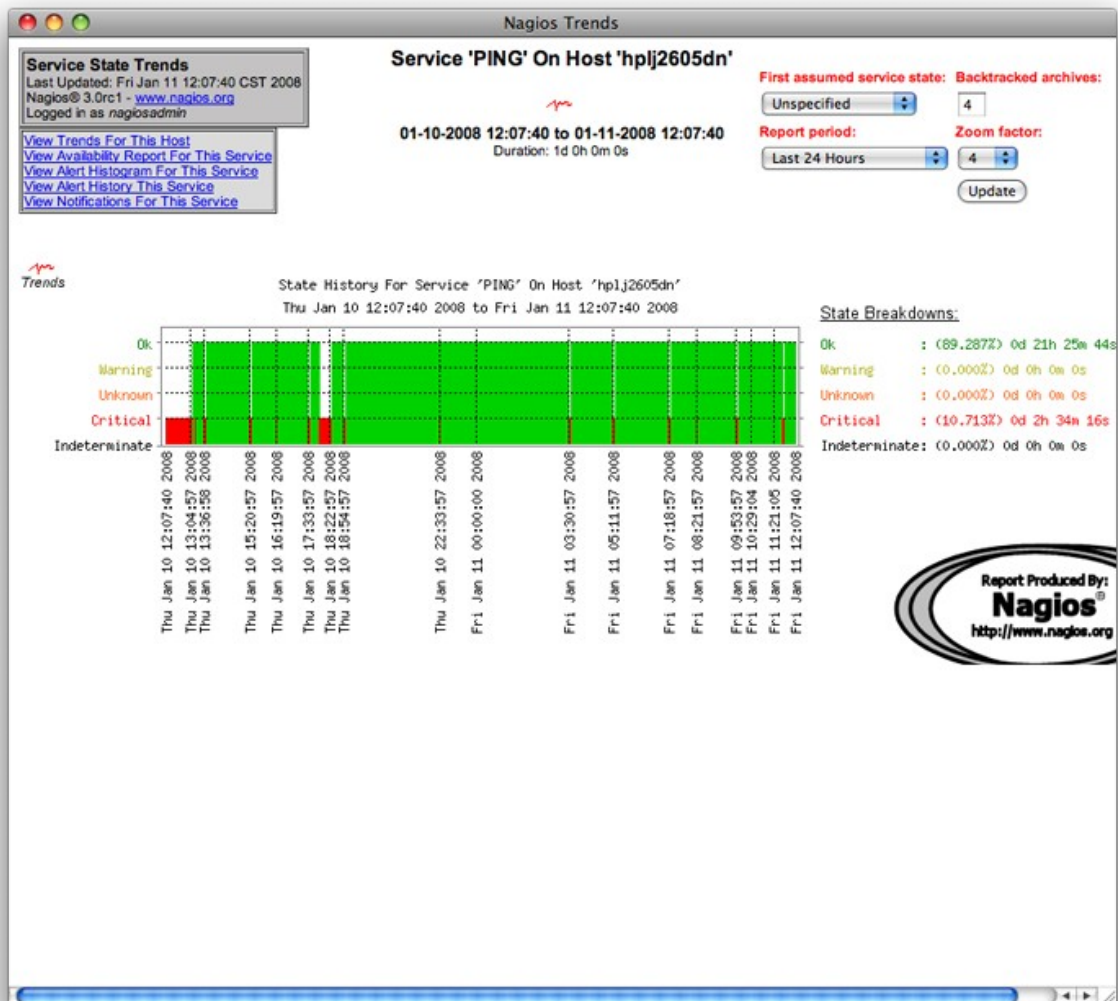
This detailed screen shows the specific monitoring configuration on a per-host-basis.

10.2.7 Nagios Trend Host View



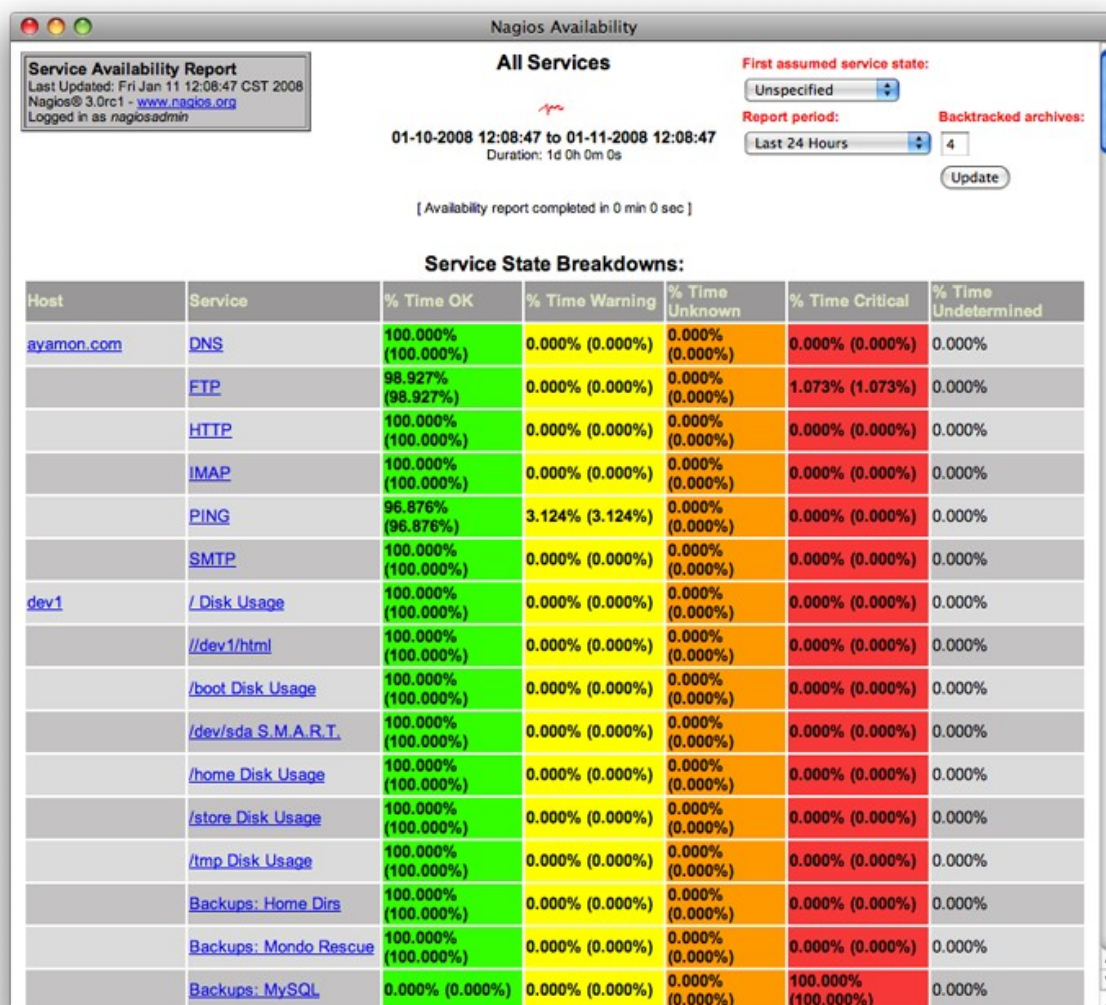
With the trending tool the overall availability and availability trends are being calculated in a format which delivers the perfect basis to calculate SLA aspects.

10.2.8 Nagios Trend Service View



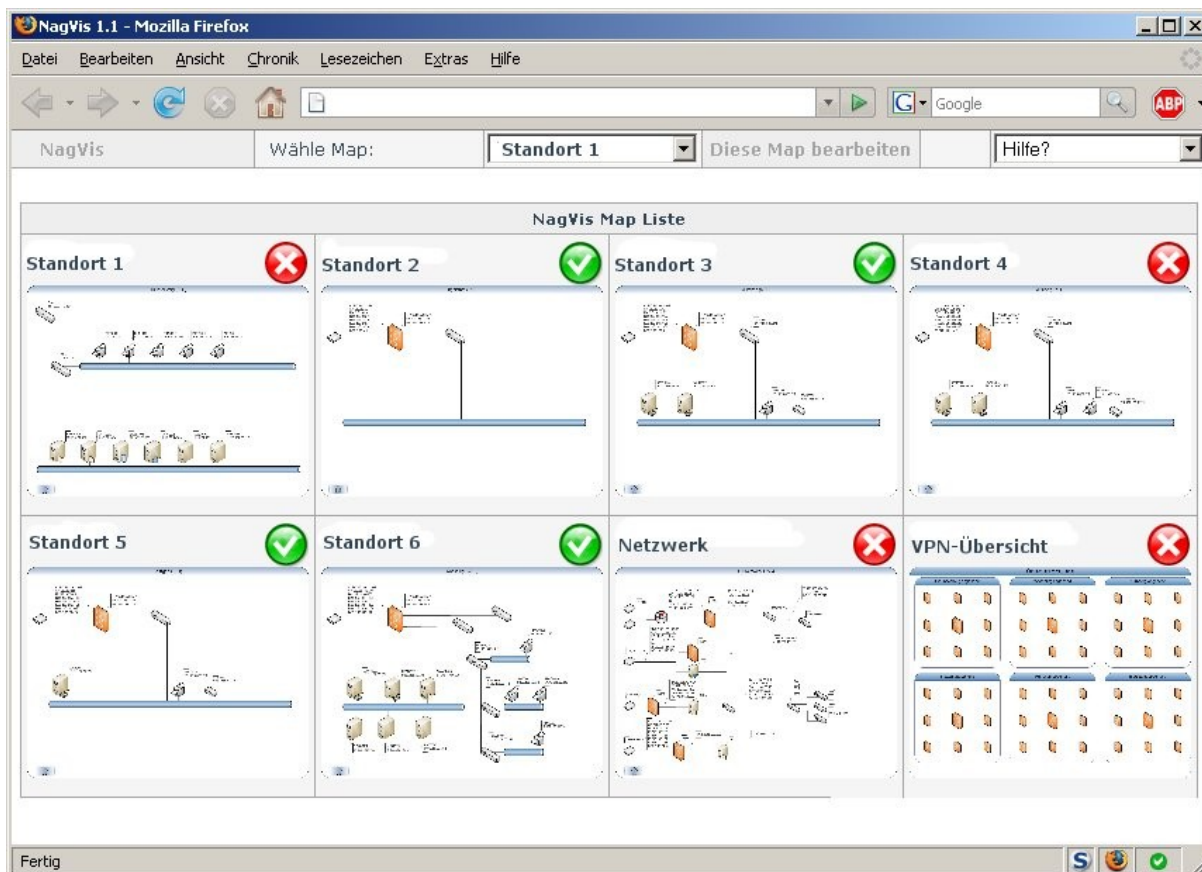
This example shows service outages on a timeline. Perfect for reconstructing events or managing outages.

10.2.9 Nagios Service Availability



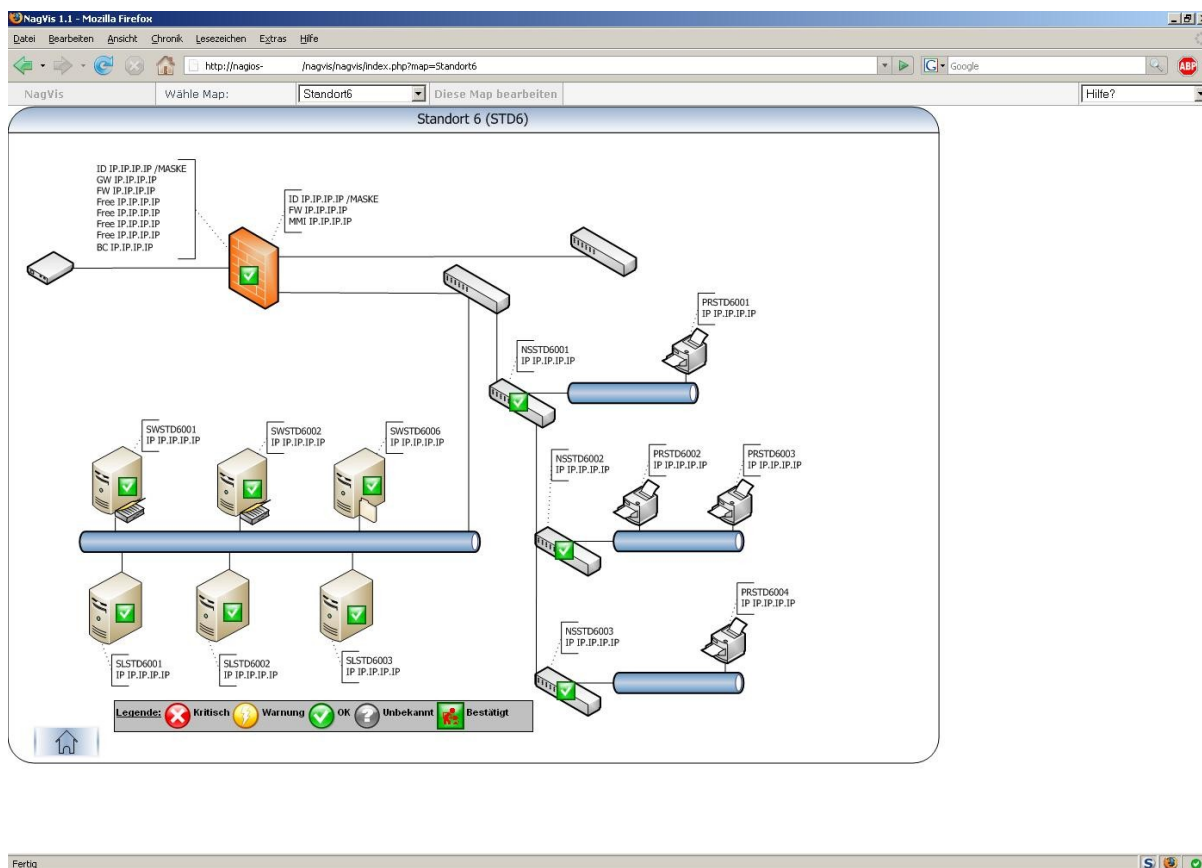
This feature of the monitoring platform calculates the detailed service availabilities in a defined timespan on a per-host-basis.

10.2.10 Nagvis Overview



With the Nagvis extension the whole monitoring infrastructure can be combined with informal layouts and graphs. This tool is of great value and helps visualising the very low-level technical measurements by transforming them to very informal and high-level views enabling the operator to quickly identify potential problems.

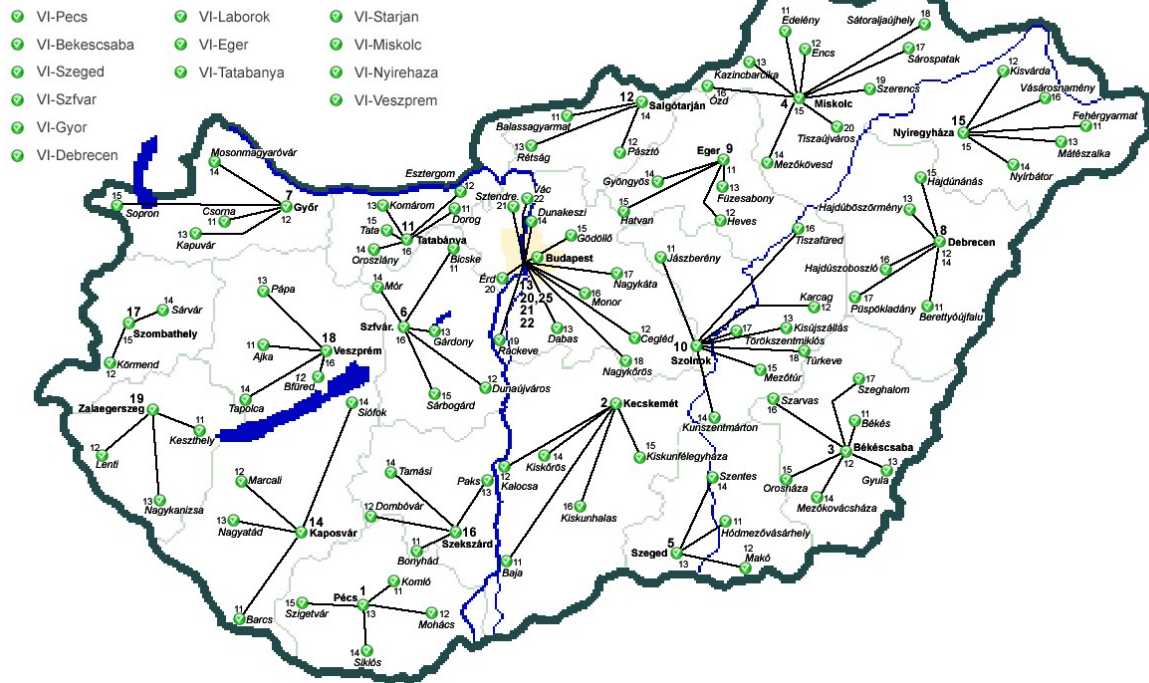
10.2.11 Nagvis Overview



With the Nagvis extension the whole monitoring infrastructure can be combined with informal layouts and graphs. This tool is of great value and helps visualising the very low-level technical measurements by transforming them into very informative and high-level views enabling the operator to quickly identify potential problems.

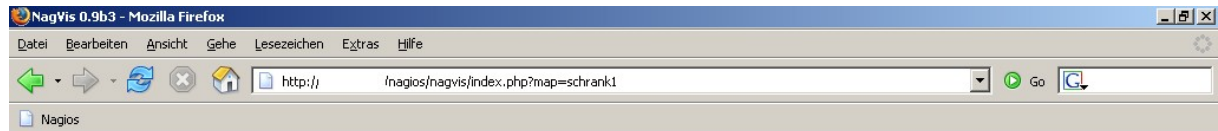
10.2.12 Nagvis Map Overview

Bérelt vonalak az országban

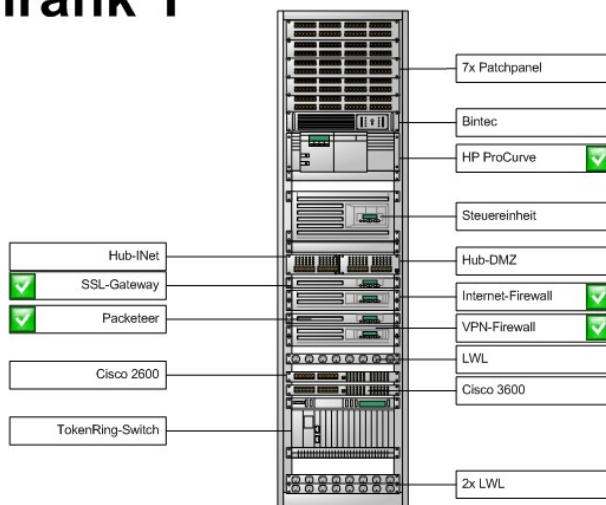


There is no limitation to the way the operator wants the service checks to be correlated and represented. In this example a very high-level country-wide overview of a system is shown.

10.2.13 Nagvis Rack Overview



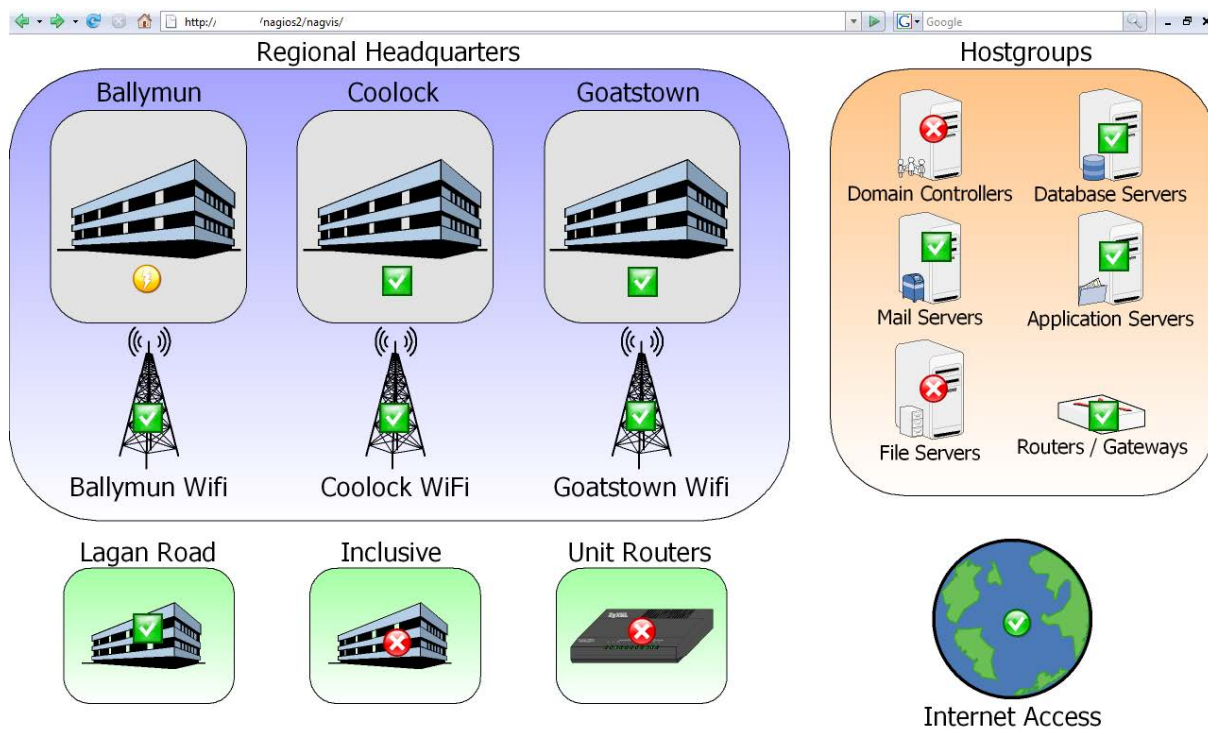
Schrack 1



Fertig

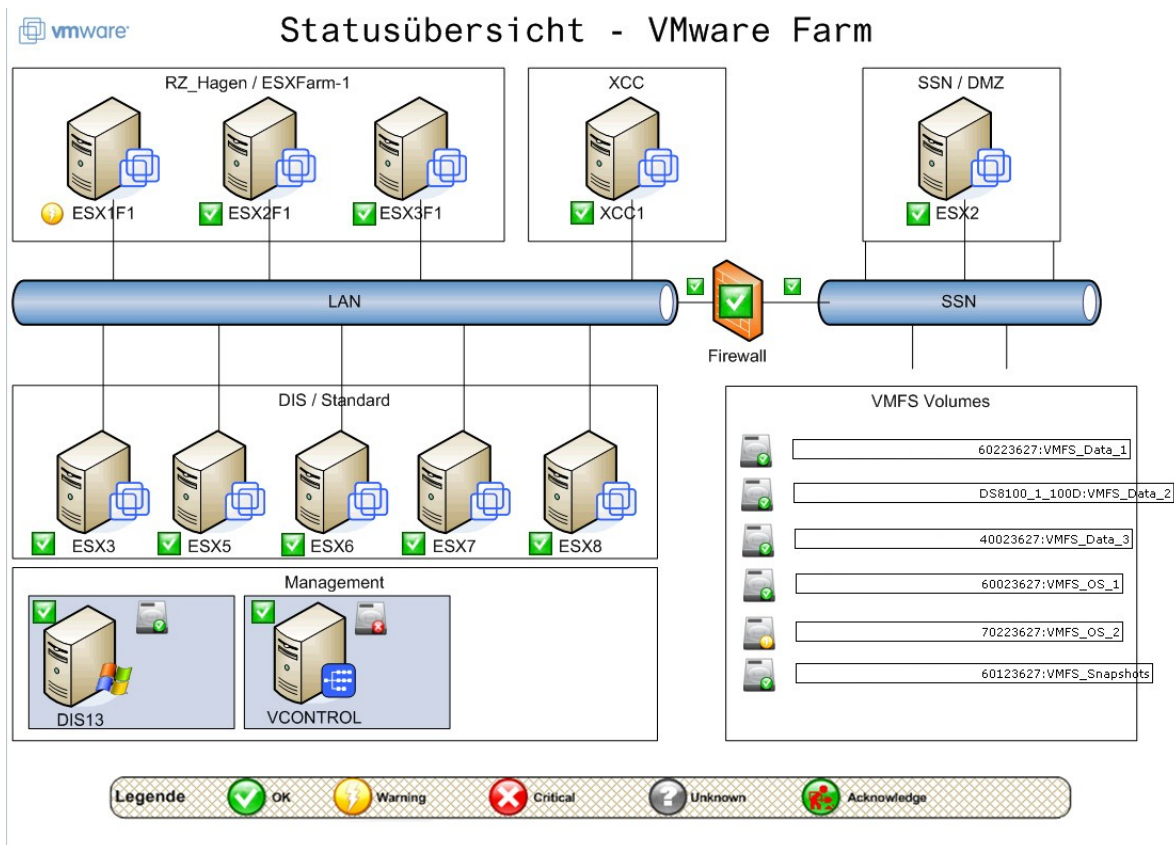
Combining multiple views and graphs lead to considerably reduced debugging times. From the very high level layouts the operator can access the rack view and see where problems need treatment on a physical layer.

10.2.14 Nagvis Site Overview



This is another example of a very high-level and highly condensed system view. Bear in mind that the informal layouts get enhanced by the various real time checks, which, when correlated and condensed, lead to one working or not working statement per logical unit.

10.2.15 Nagvis Overview



With this monitoring platform even virtualised systems can be dissected and shown in informal graphs.

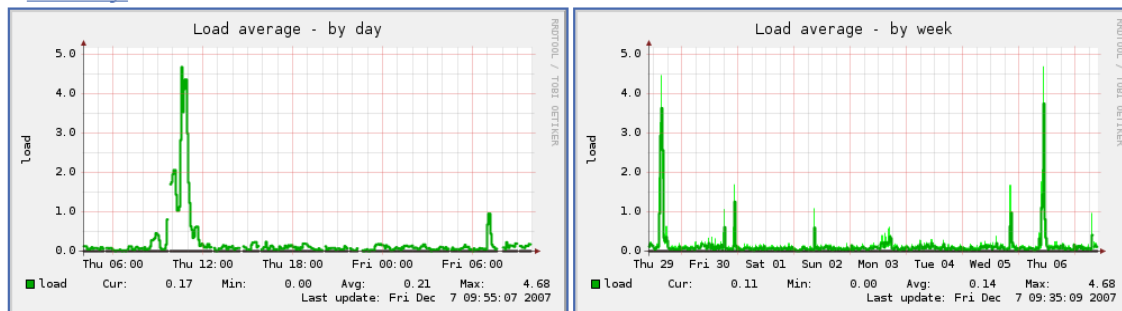
10.2.16 Nagvis System Detail Overview



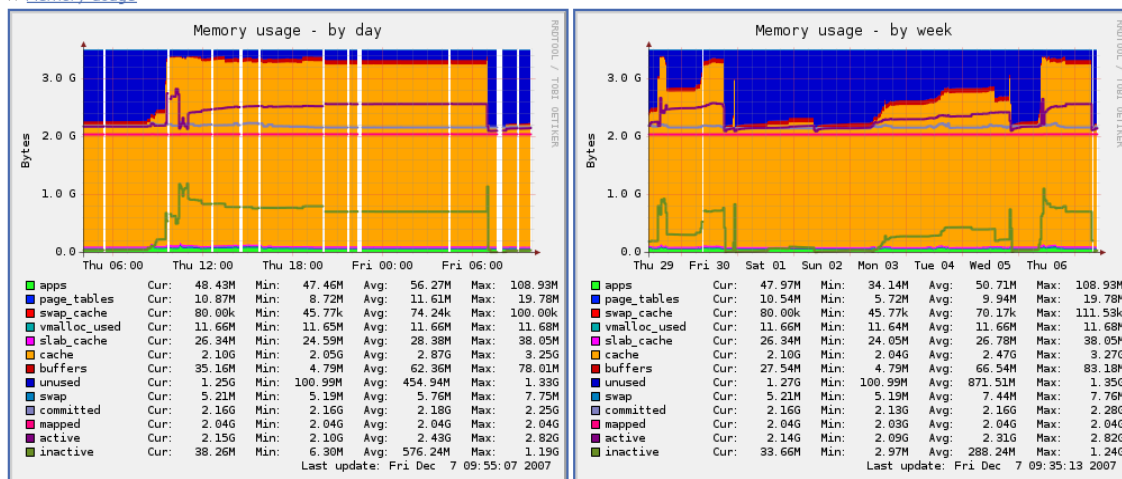
This example shows all actual performance consumptions on all systems on one single page.

10.2.17 Munin Screen Overview

:: [Load average](#)

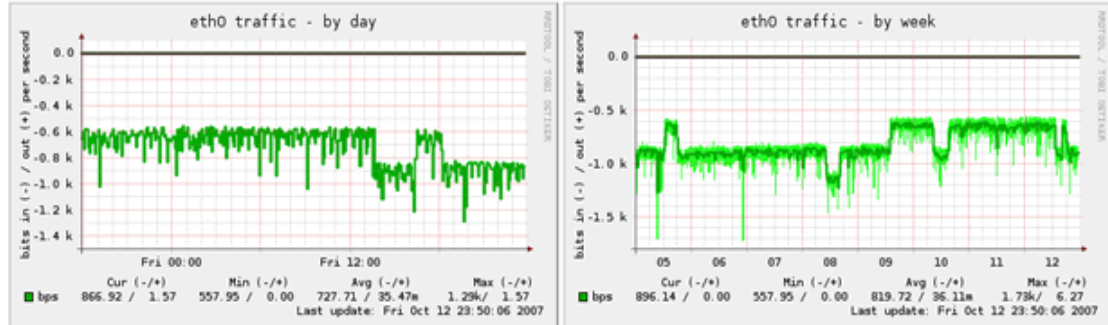


:: [Memory usage](#)

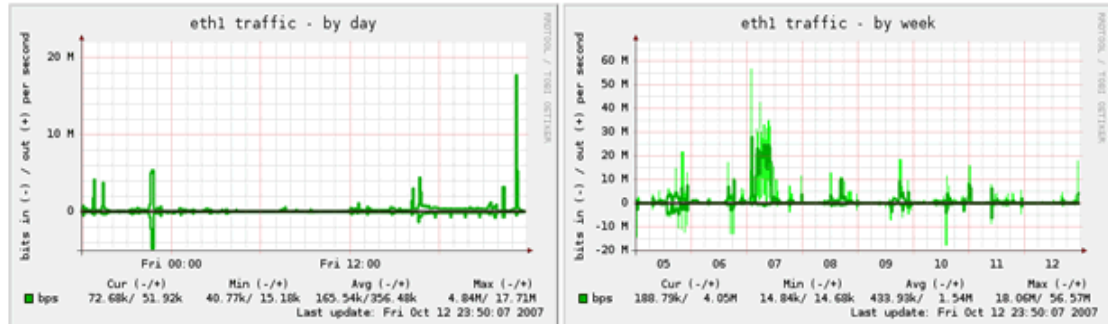


With the additional performance graphs, every measurement is shown in detail in the series plots. Operators therefore get a very detailed view of every single aspect of a service and host. With means of the time series and the operational knowledge the operators get a very detailed insight on any impact from any service providing the systems.

:: eth0 traffic



:: eth1 traffic



In this example the incoming and outgoing network traffic is shown. This is a great tool to identify performance bottlenecks and enables forecasts.