



SeaDataNet network services monitoring: Definition and Implementation of Service availability index

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SeaDataNet (SDN) is a standardized system for managing large and diverse data sets collected by the oceanographic fleets and the automatic observation systems. The SeaDataNet network is constituted of national oceanographic data centres of 35 countries, active in data collection. SeaDataNetII project's objective is to upgrade the present SeaDataNet infrastructure into an operationally robust and state-of-the-art infrastructure; therefore Network Monitoring is a step to this direction.

The term Network Monitoring describes the use of system that constantly monitors a computer network for slow or failing components and that notifies the network administrator in case of outages. Network monitoring is crucial when implementing widely distributed systems over the Internet and in real-time systems as it detects malfunctions that may occur and notifies the system administrator who can immediately respond and correct the problem.

In the framework of SeaDataNet II project a monitoring system was developed in order to monitor the SeaDataNet components. The core system is based on Nagios software. Some plug-ins were developed to support SeaDataNet modules. On the top of Nagios Engine a web portal was developed in order to give access to local administrators of SeaDataNet components, to view detailed logs of their own service(s).

Currently the system monitors 35 SeaDataNet Download Managers, 9 SeaDataNet Services, 25 GeoSeas Download Managers and 23 UBSS Download Managers .

Taking advantage of the continuous monitoring of SeaDataNet system components a total availability index will be implemented.

The term availability can be defined as the ability of a functional unit to be in a state to perform a required function under given conditions at a given instant of time or over a given time interval, assuming that the required external resources are provided.

Availability measures can be considered as a are very important benefit becauseT

- The availability trends that can be extracted from the stored availability measurements will give an indication of the condition of the service modules.
- Will help in planning upgrades planning - and the maintenance of the network service.
- It is a prerequisite in case of signing a Service Level Agreement.

To construct the service availability index, a method for measuring availability of SeaDataNet network is developed and a database is implemented to store the measured values.

Although the measurements of availability of a single component in a network service can be considered as simple (is a percentage of time in a year that the service is available to the users), the ipmlementation of a method to measure the total availability of a composite system can be complicated and there is no a standardized method to deal with it.

The method followed to calculate the total availability index in case of SeaDataNet can be described as follows:

The whole system was divided in operational modules providing a single service in which the availability can be measured by monitoring portal.

Next the dependences between these modules were defined in order to formulate the influence of availability of each module against the whole system.

For each module a weight coefficient depending on module's involvement in total system productivity was defined.

A mathematical formula was developed to measure the index.

