

# Network monitoring application

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## 1 Background

Companies with larger networks of varying nodes (servers, workstations, tablets, etc.) make use of network monitoring solutions such as SolarWinds in order to ensure high availability for the devices. These solutions are often accessible through a web interface. They are able to dispatch notifications by e-mail to the responsible network/system administrators upon the detection of an unscheduled downtime for a given device in the network.

## 2 Description

### 2.1 Problem

These network monitoring applications, more often than not, over-complicate things. This will in turn demotivate the administrators to operate the applications in a proper way (e.g. update nodes; add new nodes and remove old ones). The plethora of features that usually come with these solutions have added too many points of failures. Another issue is that the UI/UX appears to be very dated in a lot of these applications and a much better job could have been done in that regard.

### 2.2 Areas of focus

We need to maintain a minimal set of important features so that we can conform to the requirements of administrators all around the world. Focus on:

- Web interface with proper UI/UX for easy access and usage.
- Visual network maps, e.g. over all the servers in a given country.
- Downtime notifications.
- Making use of NP-complete problems in order to determine which downed nodes to act on first, given the circumstances, in order to retain high availability.

## 2.3 End product

The end product will be a network monitoring application which is capable of being used for a longer period of time, without the need for regular maintenance and administrator intervention.

## 3 Suggested literature

### 3.1 Books

- Designing Interfaces: Patterns for Effective Interaction Design 3rd Edition
- About Face: The Essentials of Interaction Design 4th Edition
- Design Patterns: Elements of Reusable Object-Oriented Software 1st Edition
- Clean Code: A Handbook of Agile Software Craftsmanship 1st Edition
- Computers and Intractability: A Guide to the Theory of NP-Completeness 1st Edition

## 4 Authors

Anwarr Shiervani

## 5 Relevant programs

DV, IT and D.

## 6 Recommended prerequisites

### 6.1 Courses

- DAT216 / TIG091 Design och konstruktion av grafiska gränssnitt
- DAT355 / DIT045 Requirements and User Experience
- TDA367 / DIT212 Objektorienterat programmeringsprojekt
- DAT026 / DIT992, LGMA65 Mathematical modelling and problem solving

## 6.2 Miscellaneous

- Minimal network knowledge. An understanding of how to check whether or not a device is down, such as by making use of pings.
- Good knowledge of virtualization. An understanding of how to deploy virtual machines, and of how to use Docker and/or Kubernetes; in order to replicate a large-scale, real-world network for testing with the application.

## 7 Supervisor

N/A.