

Network Mapping Software

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DETAILED DISCUSSION

This project will mainly focus on visualization of an existing local area network. Program will automatically generate a map of the whole network. User will be provided with many options that will allow him to decide what will be displayed. When network map will be generated it will automatically collapse least important nodes like end devices and switches. Program by default will only display the Routers. This can be easily changed by using a dropdown menu with radio buttons for each node type e.g. Routers, switches, PC's, printers etc. Root node will be the one connected to the internet and from there all the other nodes will be generated. Program will also give the ability to group the nodes by e.g. departments.

Program will also be capable of saving the information to the database for future analysis. Admin can specify how often the database would be updated, e.g. every 5min program will sent information to the database which all the details like working nodes, speed between the nodes, amount of users, time, date etc. Also there'll be an option to specify how often the network map will be refreshed, run-time, every few seconds or minutes. This will stop the program from using up the bandwidth. This data will be displayed as a graph or chart in the History menu where the user will be able to compare data from different times, days or weeks to see how the network is behaving.

User will also be informed about possible bottlenecks in the network or other issues with non-intrusive way e.g. high traffic on one of the links will be indicated by color red if speed is greater than e.g. 90%, then yellow if link is at 70%. Program will also check the delay between different nodes (ping).

System functionality:

- Ability to save custom display settings, map refresh time and database update
- Hide less important nodes
- Display only the nodes user is interested in
- Easy to follow network map
- Ability to display detail information about each node
- View current bandwidth utilization and its max speed
- User notifications

Since this type of system will required administrative rights it will be designed for administrators of the network.

EXISTING APPLICATIONS IN THIS DOMAIN

Software	Similarities	Differences
TopoMapper Plus	Uses a detailed map of devices in the network routers switches, end devices Displays detail information about each device is selected Links between the nodes are labeled Section for Reports or notifications	Uses inventory to detect changes in the network, e.g. added/deleted devices and their ip addresses There is no function to hide specific device type, everything is on the map Links do not display any extra information
Spiceworks	Customizable map Details about the bandwidth between the nodes Allows to quickly diagnose a problem with a network Display additional information about selected device	Graphically monitors ink and toner Uses inventory to store all the devices that were connected to the network

PLATFORM, TECHNOLOGIES AND LIBRARIES

Project is aiming to be designed for windows platform but if time constrains allow simpler version of this system will be deployed for an android or windows phone. For windows version program will be developed in C# with additional libraries necessary to establish a network connection and discover all devices on that network. The libraries will be mainly coming from SNMP side mainly because this service is more flexible and allows pulling down some extra details from devices that run SNMP service. However to obtain directly connected devices and create a map of the network system will possibly use telnet to pull down routing table from routers and switches. To store all the information gathered about the network a connection to Microsoft Azure will be necessary. This will provide more flexible use of the database for possible mobile devices. Visual Studio will be the main tool used for the development of that system since it has many useful libraries available to download and it support Microsoft Azure which is quite important in this project. For possible mobile deployment, for android or windows phone programs like Android Studio will be used and as mentioned before Visual Studio for windows. Both programs will require additional libraries for connecting to online database.

THE RISK

This project in order to run will require extra privileges that are not available from the user level, i.e. in college network the program will run correctly from the administrative account which has all the necessary rights for the program to run without any problems. Program will mainly be dependent on SNMP libraries to get the detail information about each node. Also SNMP will need to be enabled on all the devices to pull down the details. Also discovering all the nodes on a network might be problematic due to many restrictions in private networks. To get the necessary information about each node program will possibly have to telnet to each router and get its routing table in order to map all the devices connected to that router or switch. If time constraints allow another risk may line in implementing the system onto mobile devices. They will need to have simplified design and will requires access to Microsoft Azure to get all the necessary details, due to a fact that mobile platform is not as powerful as PC or a laptop there may be some optimization issues because a mobile device will have to generate a simplified map from the router that is connected to up to the main router connected to the internet. Depending on my choice for mobile deployment either Android Studio or Visual Studio will be used for the development. Possible risk with Android Studio is that it's still in Beta and may not provide all necessary features.