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# Progress

|  |  |  |
| --- | --- | --- |
| **What** | **Done?** | **When?** |
| First contact e-mail | DONE | 27.09.2018 |
| Fixed meeting time | DONE | Response: 01.10.2018 |
| Prepare meeting questions | Miro - DONE  Roger - DONE  Tim - DONE  Jules - DONE  Jan -DONE |  |
| Hold meeting | DONE | 02.10.2018 08:45 - 09:45 |

# Know the company

## Stakeholder description from project description

### Stakeholder

ICE Center @ETH

### Problem

In a world where more and more critical services converge on IP, even slight network downtimes can cause large financial or reputational losses. This strategic importance contrasts with the fact that managing a network is surprisingly hard and brittle. Out of high-level requirements, network operators have to come up (often manually) with low-level configurations specifying the behavior of hundreds of devices running complex distributed protocols. A single misconfiguration can bring down the network infrastructure, or worse, a piece of the Internet in case of BGP-related misconfigurations. Every few months downtimes involving major players such as NYSE, Google, Facebook, or United Airlines make the news. Actually, studies show that human-induced misconfigurations, not physical failures, explain the majority of downtimes.

### Solution

To address this challenge, new systems that are capable to automatically configure a network have emerged. To use these systems, network operators define the desired behavior of the network by specifying high-level requirements (security, host reachability, load-balancing, etc.) and then the system compiles these to low-level configurations to be deployed at each individual router of the network. The main benefit of these approaches that they are guaranteed to avoid mis-configurations, provided that the high-level requirements fully capture the desired behavior of the network. Therefore, these systems still require a usable interface that would enable network operators to specify the requirements in an intuitive and usable way.

### Goals

The goals of this project are:

1. to provide an intuitive way to network operators to define the desired behavior of a network, and
2. to visualize the network configuration to the network operators to help them understand how the network forwards packets and foresee missing requirements.

## Project 1: Programmable networks

### Requirements

## Basic background in networks

### Goal

## Investigate how network operators can specify and visualize common network requirements:

## Investigate common network requirements (reachability, security)

## Come up with a simple interface where network operators can easily specify the requirements

## Understand how to visualize the network requirements to the users and how they affect the behavior of the network

## Additional Resources

### Website

<https://netcomplete.ethz.ch/>

### Paper

<https://netcomplete.ethz.ch/files/netcomplete-nsdi2018.pdf>

### Presentation

<https://netcomplete.ethz.ch/files/netcomplete-slides-nsdi2018.pdf>

# Questions

Idea: Everyone suggests three questions. Max. two adapted from those of the slides and one additional. Maybe specific questions that are unclear to you when you read the e.g. the presentation.

## Questions to adapt (max. 2 per person)

Move used questions to “Already used”.

### Not used

* Tell us about your company?
* Can you walk us through how you develop products?
* Which goals are you trying to accomplish with {X}?
* Which goals should your target audience accomplish with {X}?
* What are the constraints you are operating in?

### Already used

* Which skills does your target audience need to use {X}?
* Can you talk about your target audience?
* What challenges did you previously face with {X}?

## Proposed questions

* Miro
  + Are the high-level requirements an additional input to the configuration sketches, which the operator also creates?
  + You have high-level requirements, which are translated to logical formulas and then solved with the rest of the equations. Does point 1 of the goals (“Investigate common network requirements (reachability, security)”) mean that we should create a list of high-level network requirements, which would later (by someone else) be translated to formulas and put into NetComplete? I.e. are the requirements for NetComplete flexibly changeable or was the intention of that goal, that we make us familiar with the existing, built in network requirements of NetComplete?

Or maybe it’s better to just ask (to let the customer talk):

What output do you expect from us on point 1 (“Investigate common network requirements (reachability, security))?

* + Which skills does you target audience need to use NetComplete? Is the visualization in point three also only for the network operator to help him define the right requirements?
  + Do you know (future) users of your product, that we could interview?
* Roger
  + Can we assume that the topology of the network is fully specified by the user or will we also have to account for 'holes' in the network topology?
  + Is NetComplete supposed to be used in an iterative way, where operators try something out and then extend their input based on NetComplete's output, or will a user's input rarely change during one invocation of the program?
  + How would operators specify abstract high-level requirements like 'security' or ‘reachability’?
* Tim
  + Are the network sketches completely coded by the network operators? Are the sketches limited as to not allow them to be blown up (overspecified) or unencodable? Or will this be a requirement our interface should satisfy ?
  + will there be network sketches that include “holes” which NetComplete cannot autocomplete? How should these cases be handled?
  + What will happen if 2 network operators with overlapping networks optimize their network with NetComplete? Will it consider the other optimization or just act according to the local preference 1 of the operators entered on his programm and ignore the other?
* Jules
  + What are the difficulties you’ve encountered so far for designing an interface? What are the “schwerpunkte”?
* Jan
  + On point 3: Do different requirements affect the network configuration in a predictable way? Should the visualization be based on the resulting configuration of NetComplete(does this take too long?) or on the expected effects of the defined requirements directly(is this always right?)?
  + Can you talk about your target audience? How can we gain their trust in NetComplete? Will a user test the configs? Would visualizing the result of the configuration be an option?