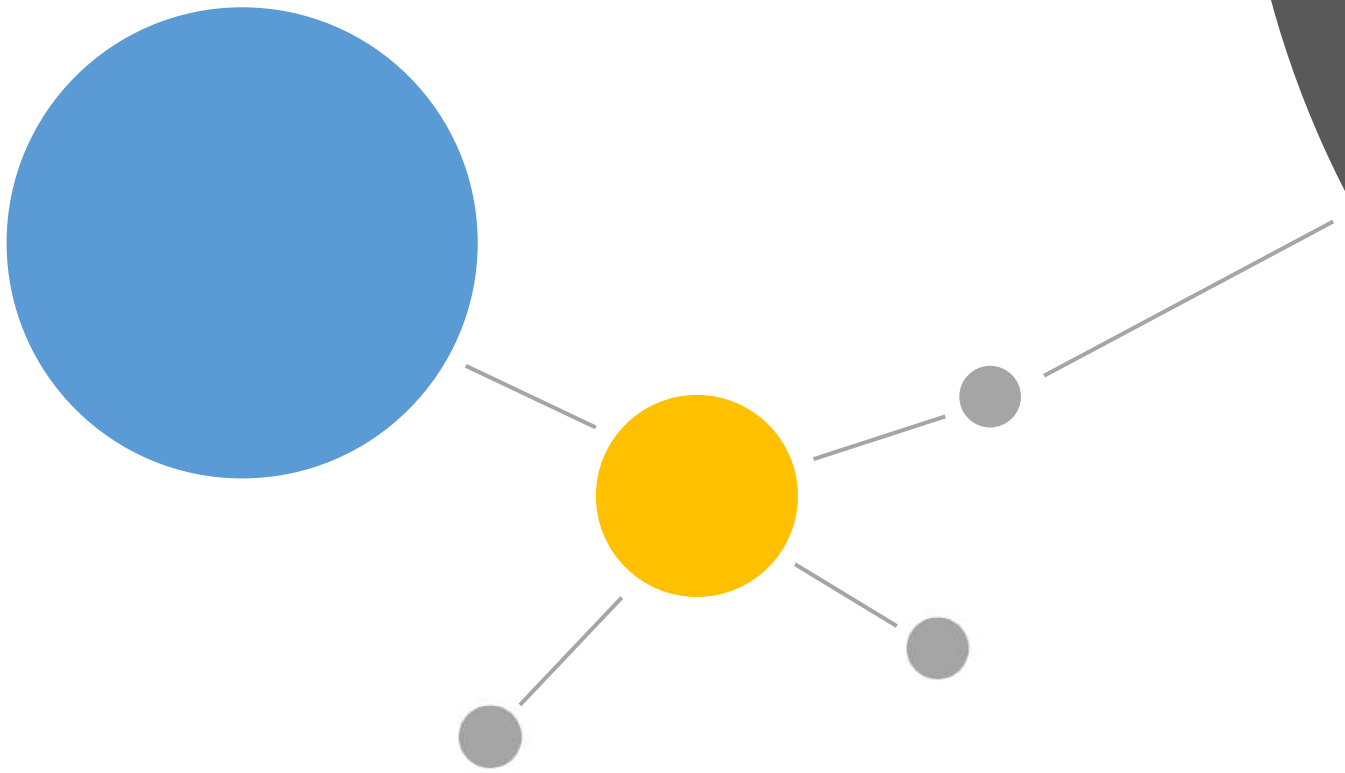

# Network Topology Detection

5G/IIoT Project

with Fraunhofer FOKUS



Marcin Bosk | Lars Lange | Jörn Strömsdörfer

# Project Description

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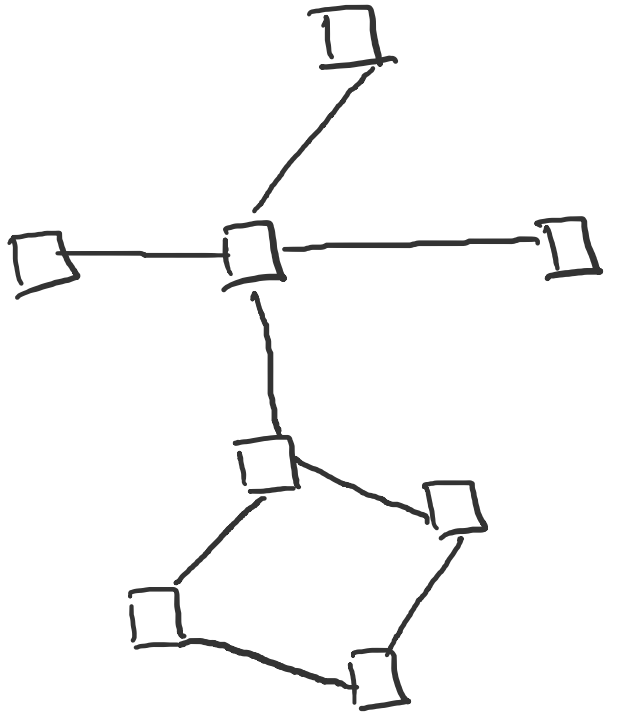



Marcin Bosk | Lars Lange | Jörn Strömsdörfer

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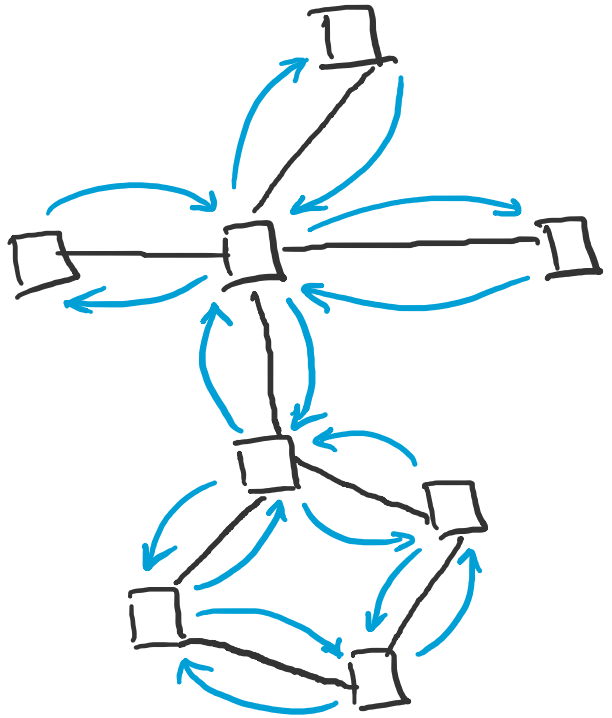



Marcin Bosk | Lars Lange | Jörn Strömsdörfer

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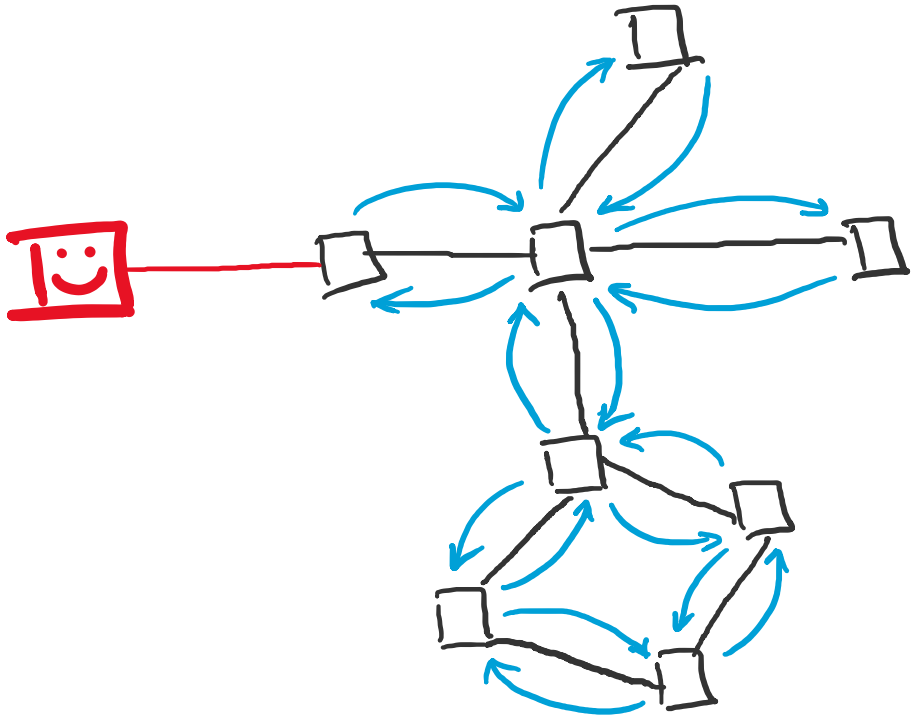



Marcin Bosk | Lars Lange | Jörn Strömsdörfer

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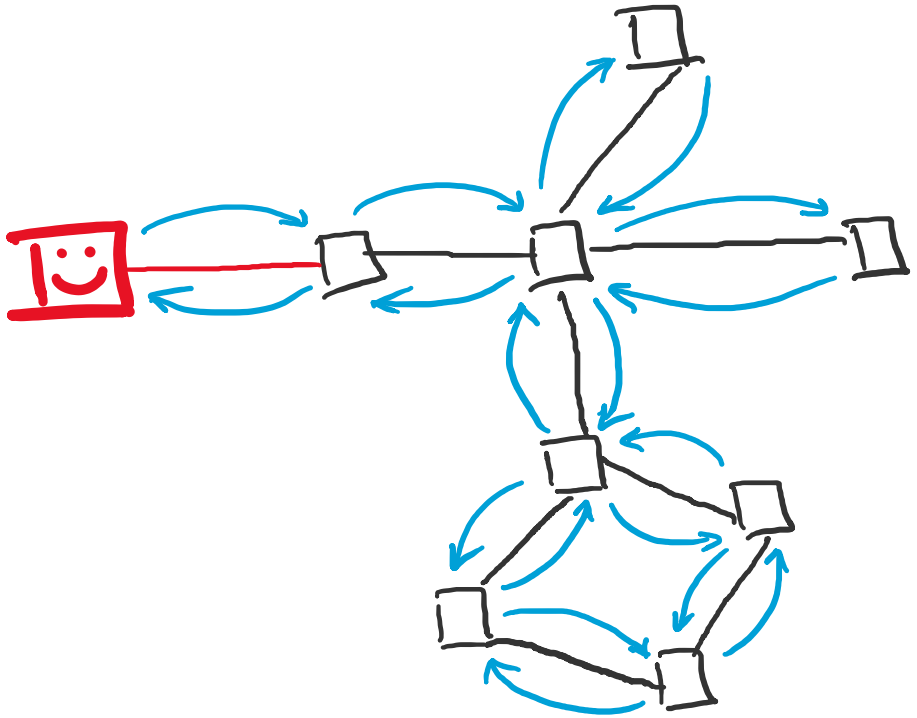



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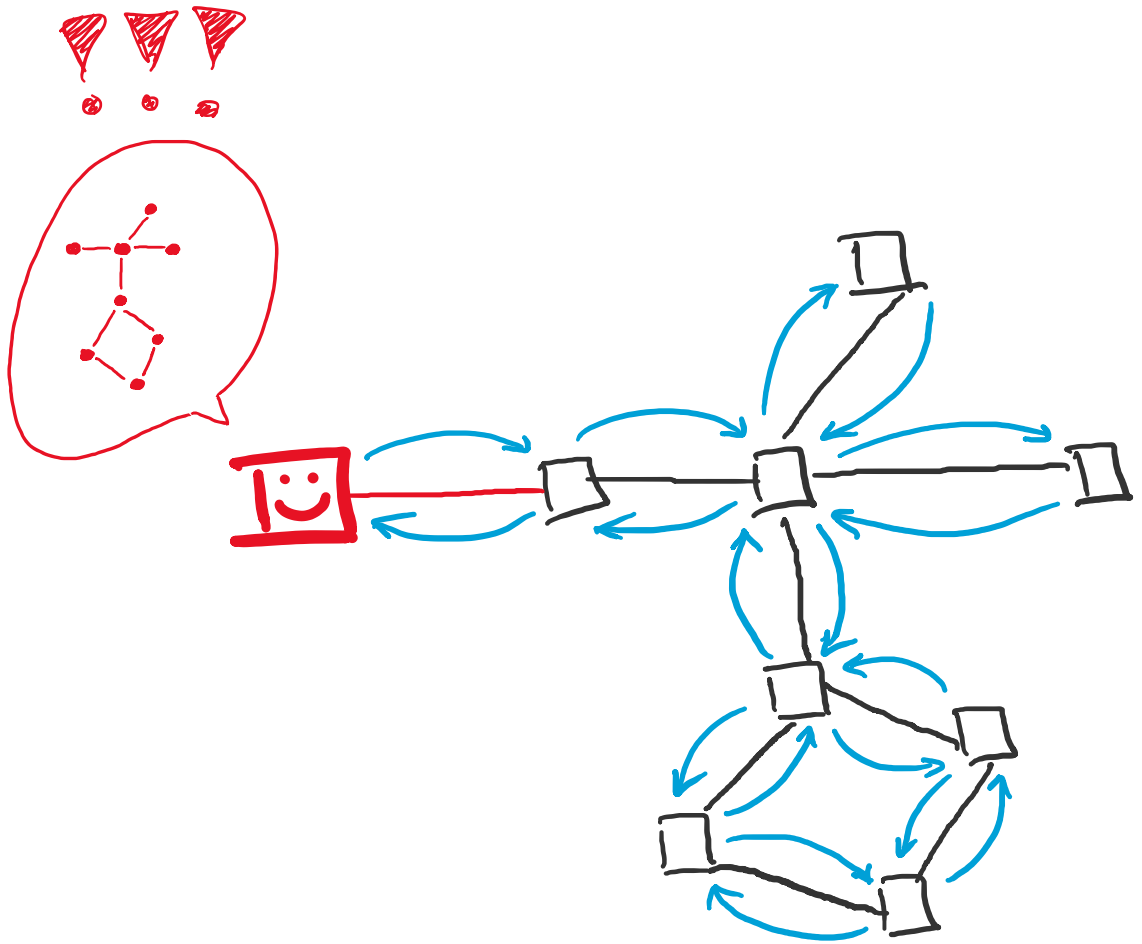



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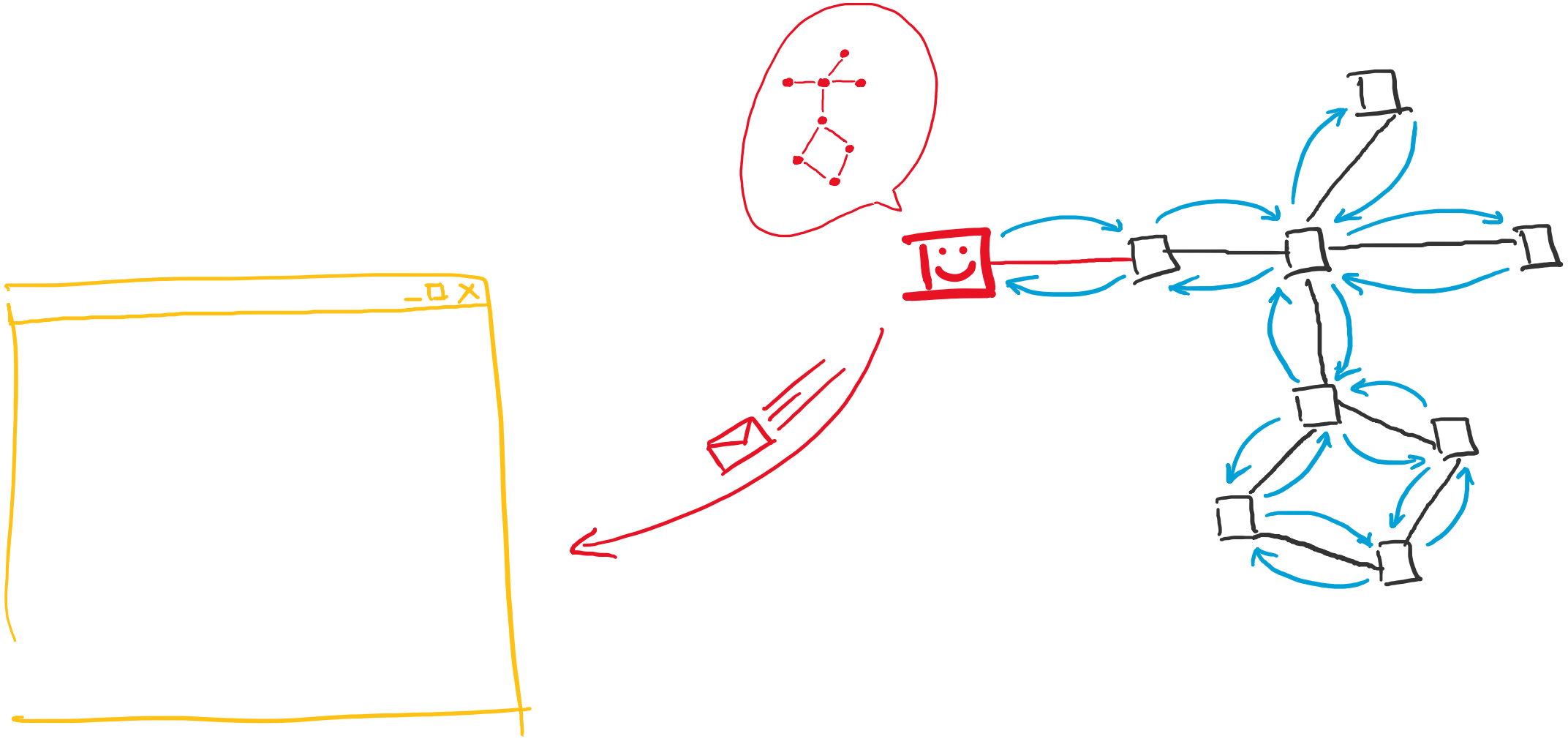



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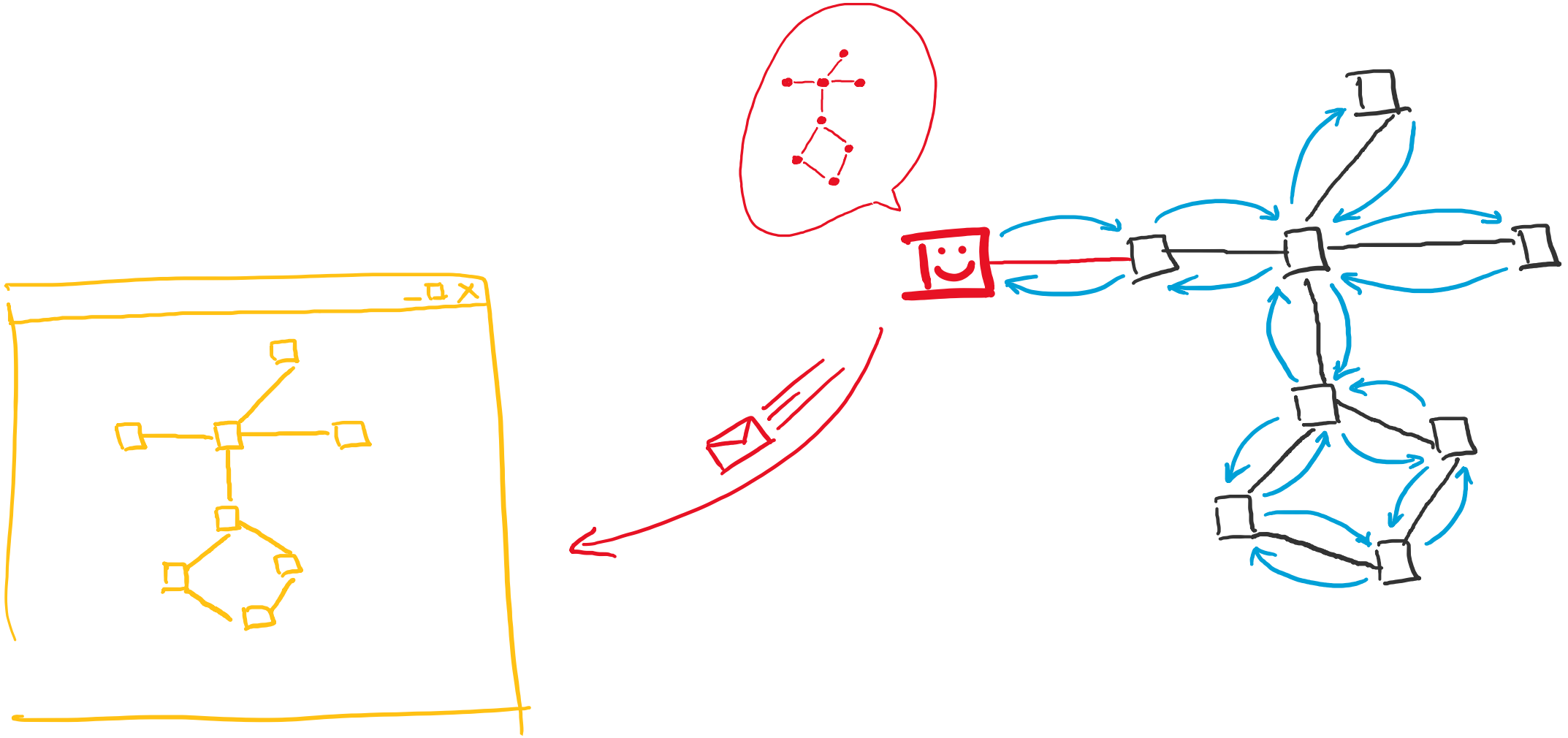



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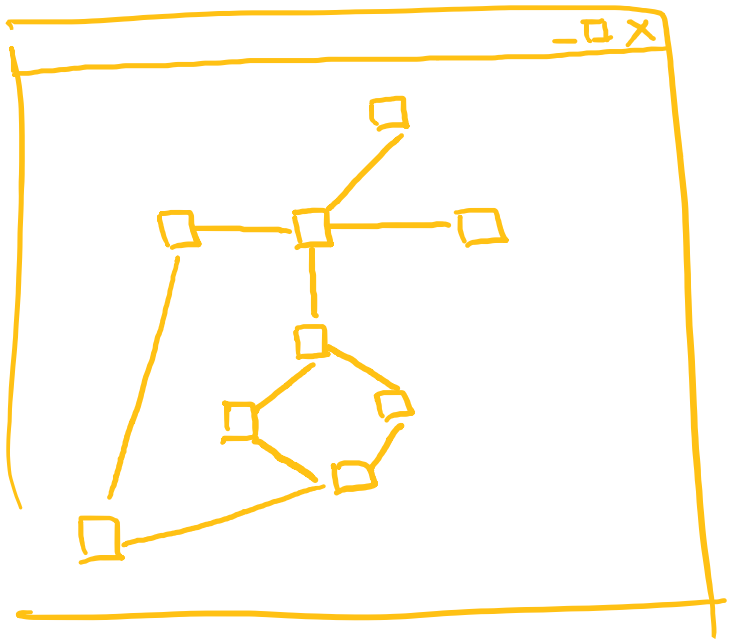

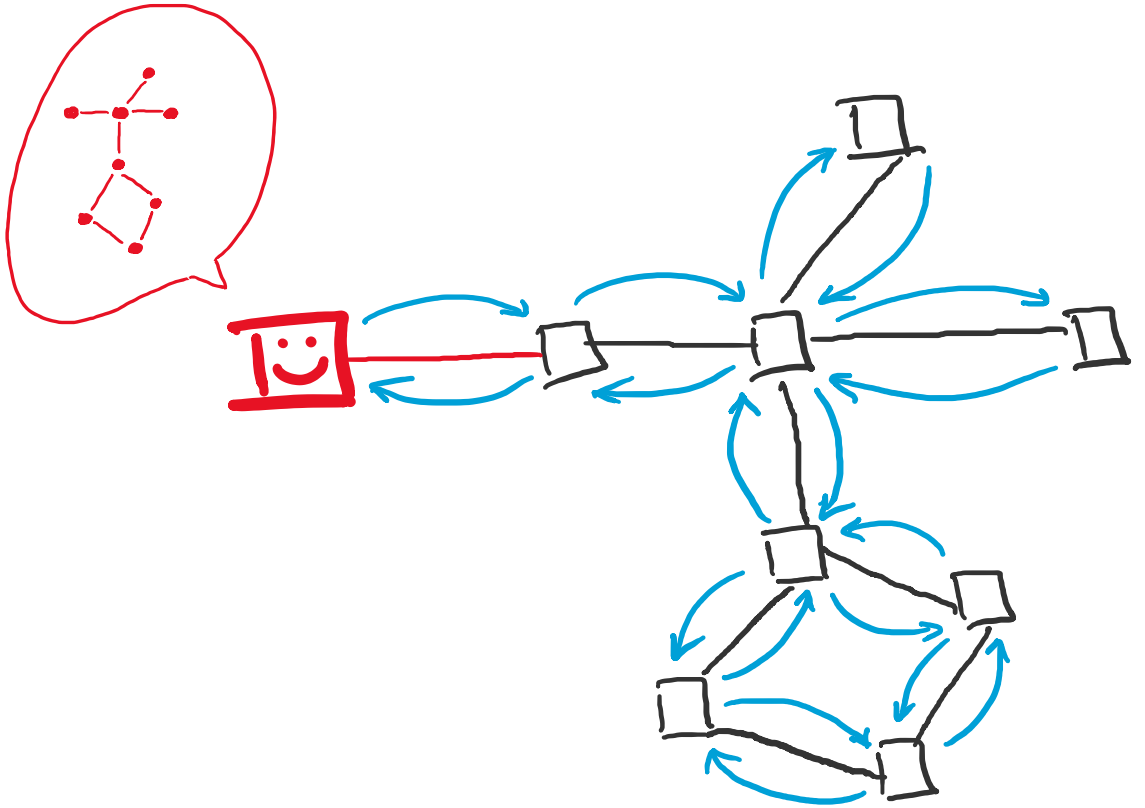



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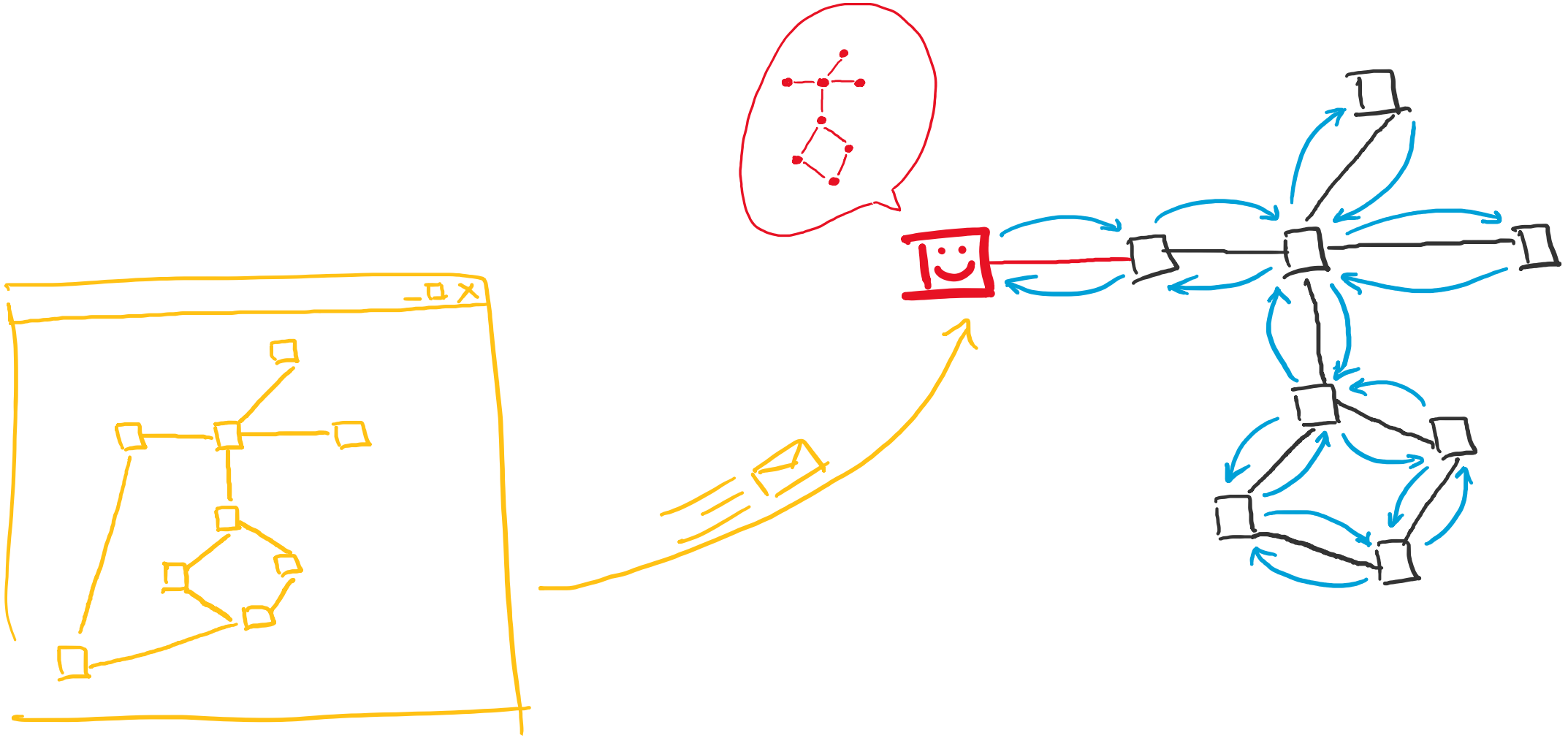



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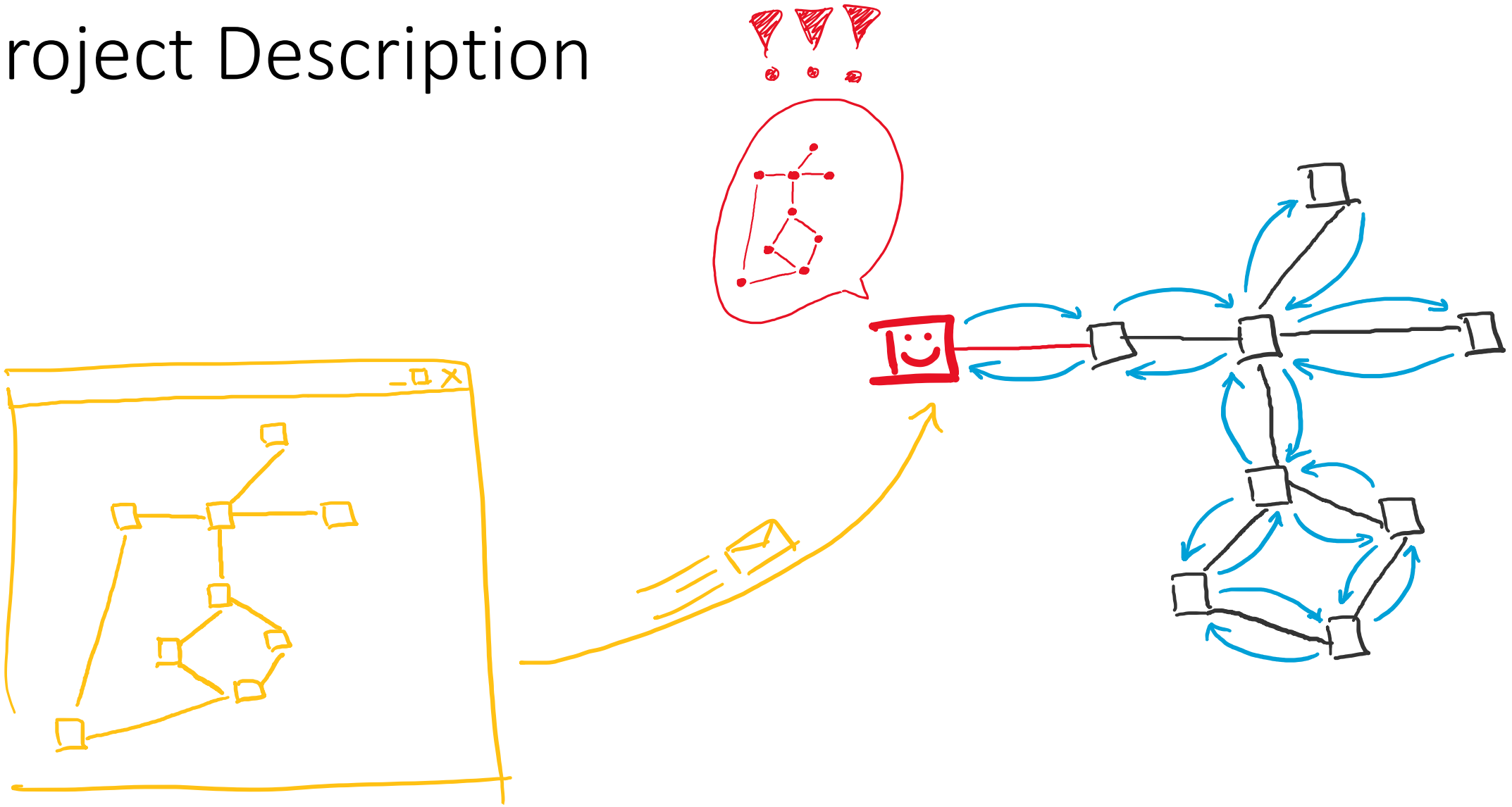



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# Project Plan



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# Project Plan

1. Building a Network



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# Project Plan

1. Building a Network
2. Detecting the Topology



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# Project Plan

1. Building a Network
2. Detecting the Topology
3. Packaging the Topology



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# Project Plan

1. Building a Network
2. Detecting the Topology
3. Packaging the Topology
4. Displaying the Topology



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# Project Plan

1. Building a Network
2. Detecting the Topology
3. Packaging the Topology
4. Displaying the Topology
5. Editing the Topology



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# Project Plan:
# 1. Building the Network


Photo by Pixabay from Pexels

Mininet

ns-3 NETWORK SIMULATOR

GNS3®

# Project Plan:
# 1. Building the Network

MIB

bridges

SNMP agents


Photo by Pixabay from Pexels

Raspberry Pi

Raspbian

Switches

SNMPd

Ethernet

LLDPd

USB -> Ethernet

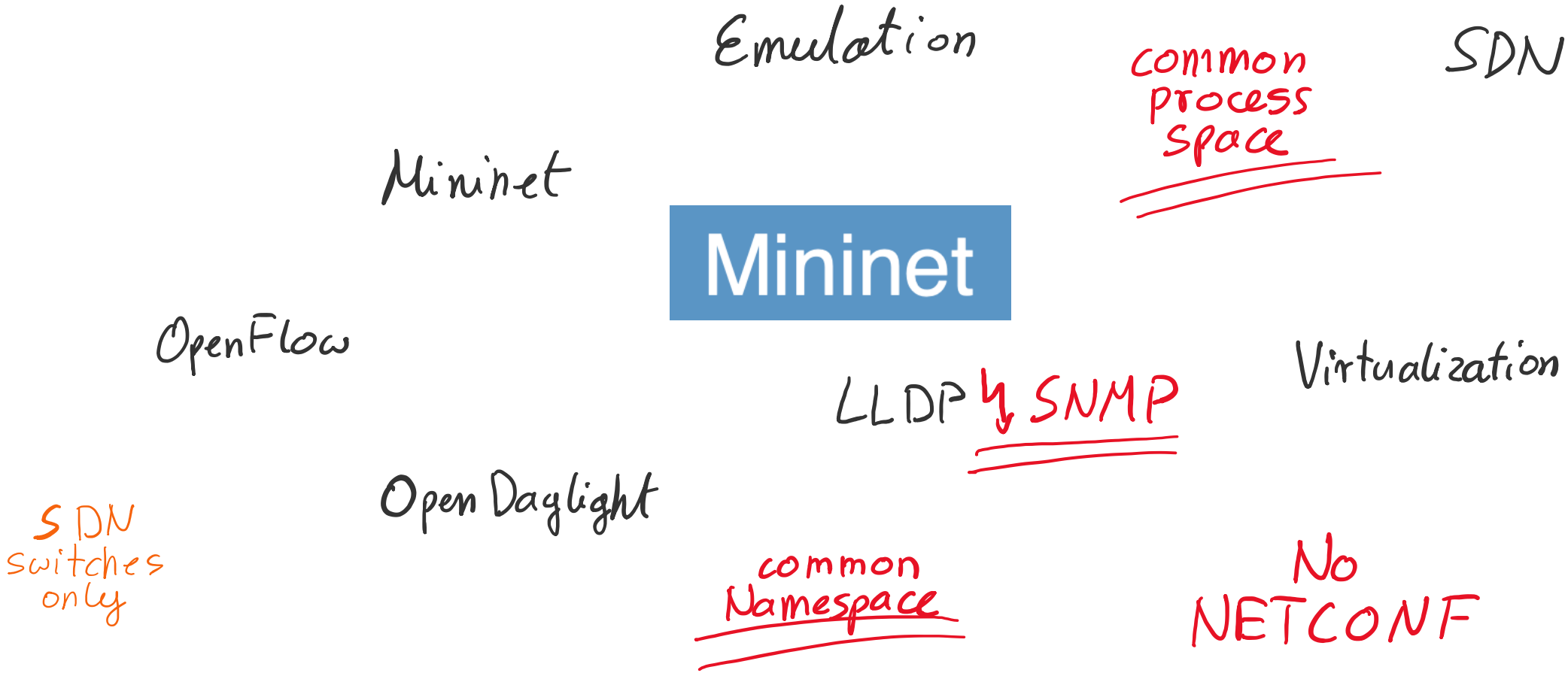
Linux

IP tables

Real Hardware

Network Manager

# Project Plan:
# 1. Building the Network



# Project Plan:
# 1. Building the Network

simulation

real time

external access?

connecting real hardware?

programmability?

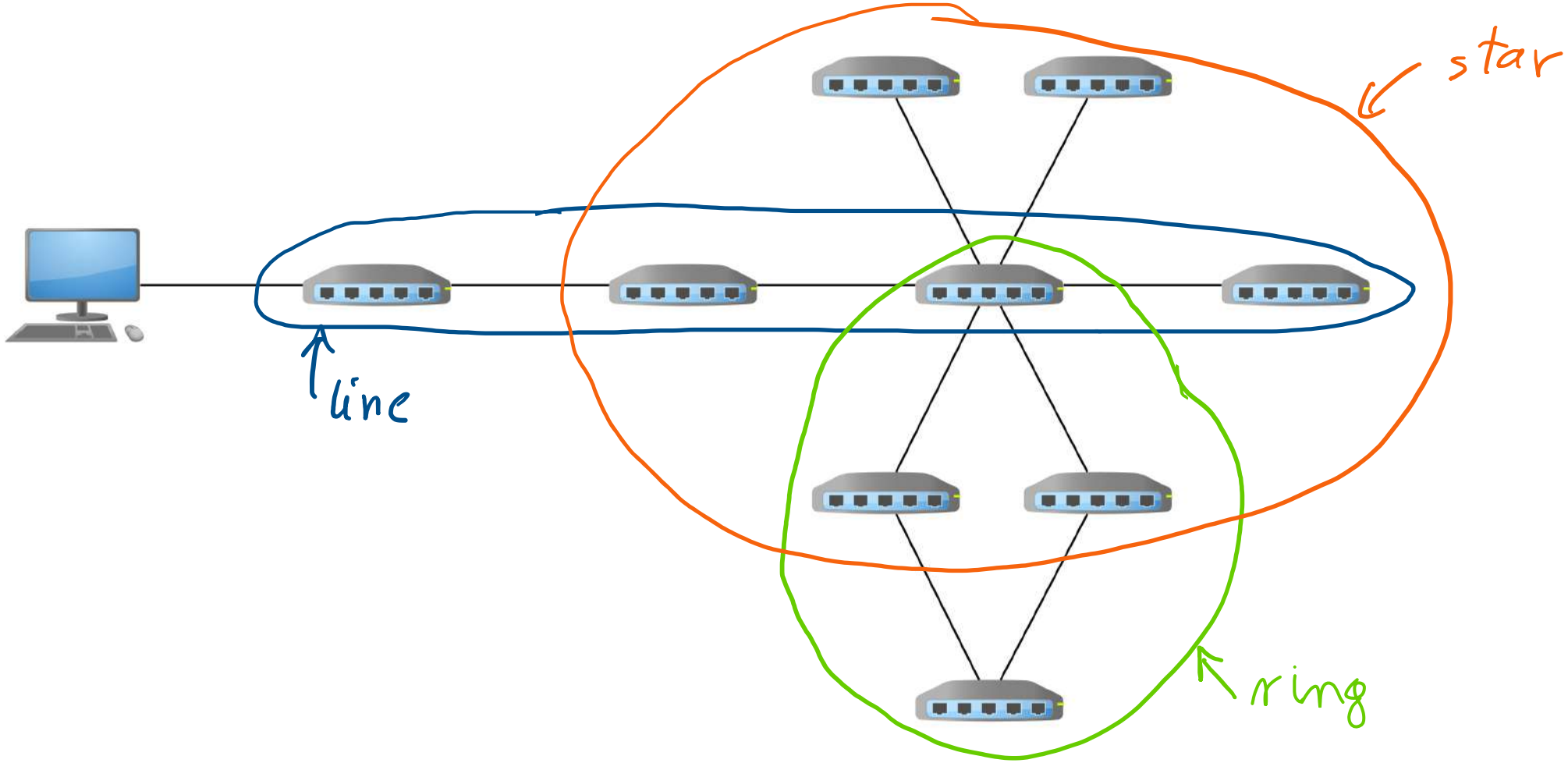

SNMP

LLDP

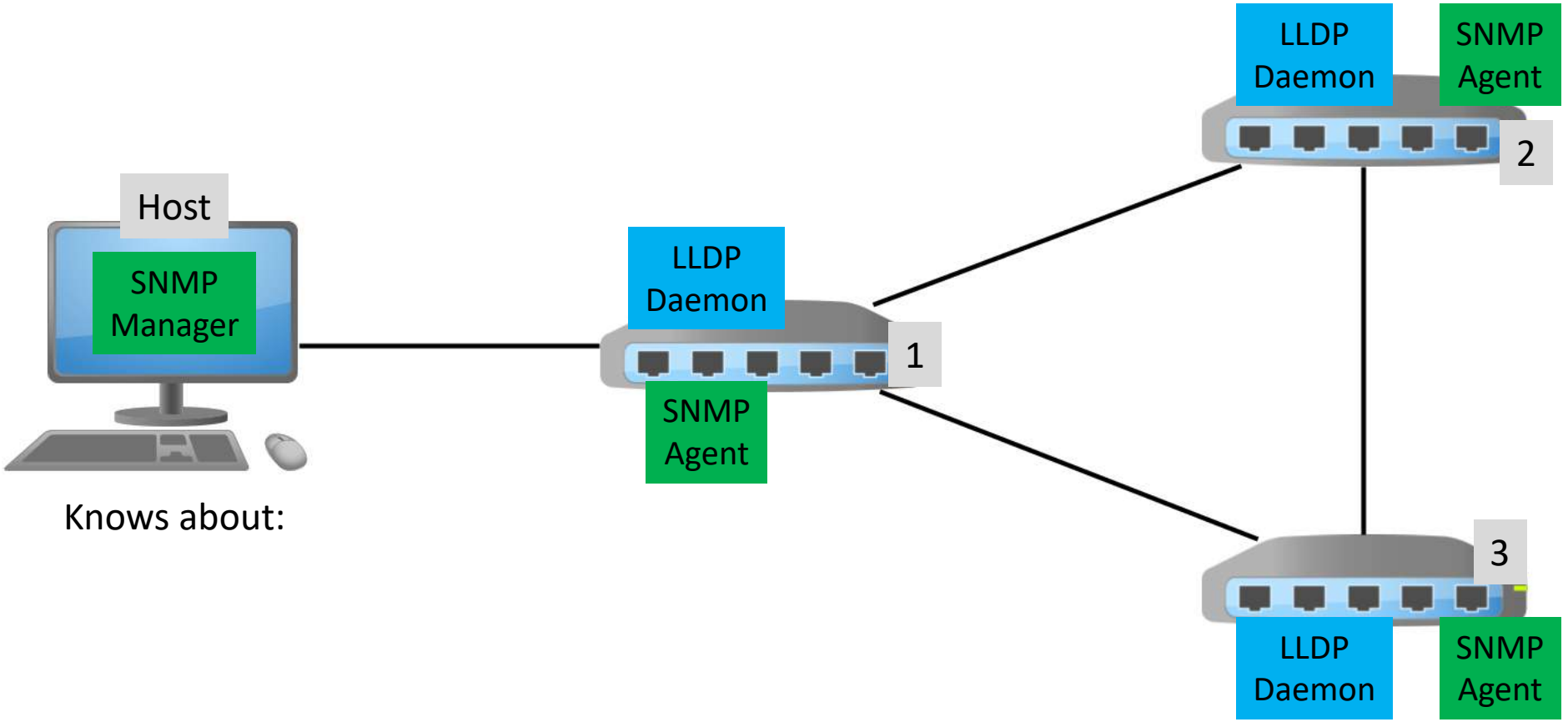
GNS3®

No LLDP SNMP

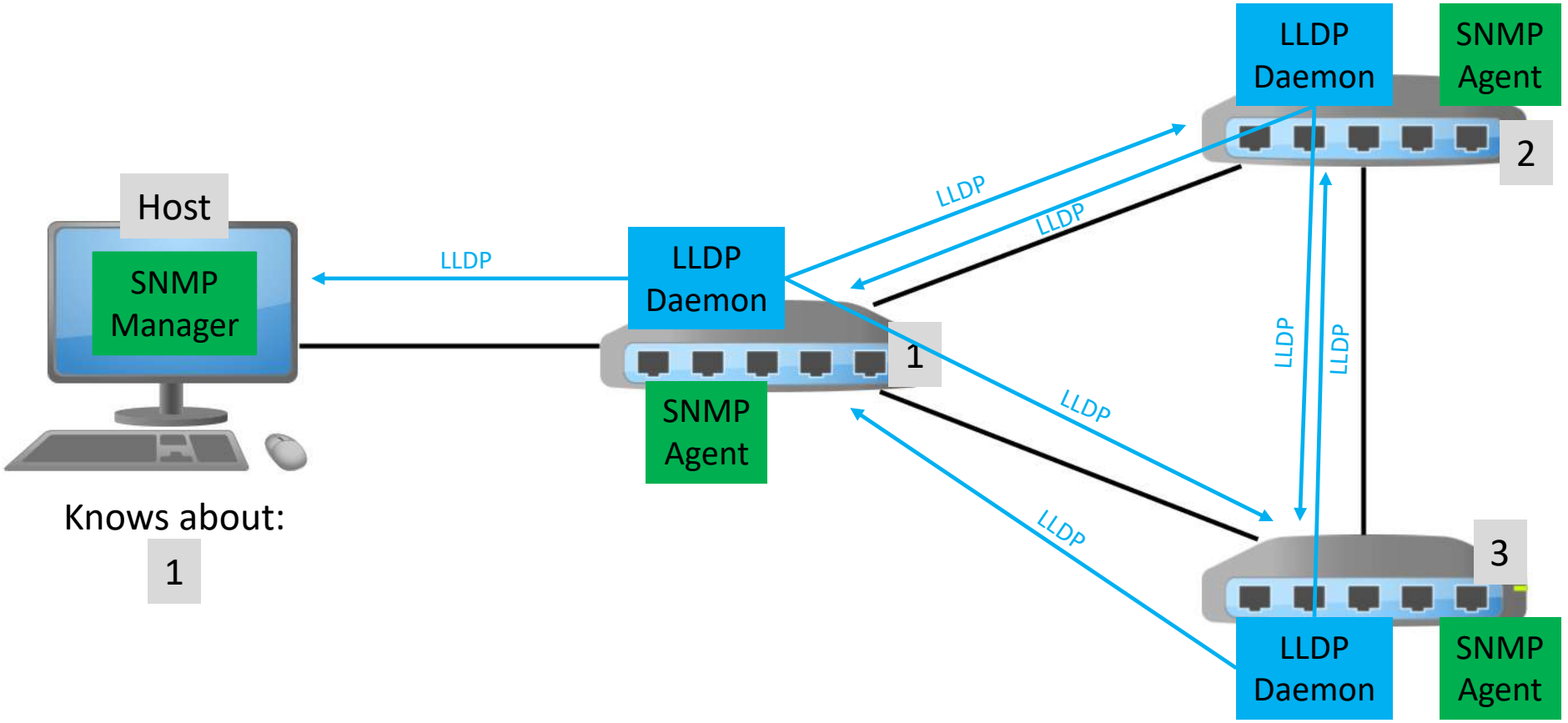
# Project Plan:
# 1. Building the Network – Proposed Topology



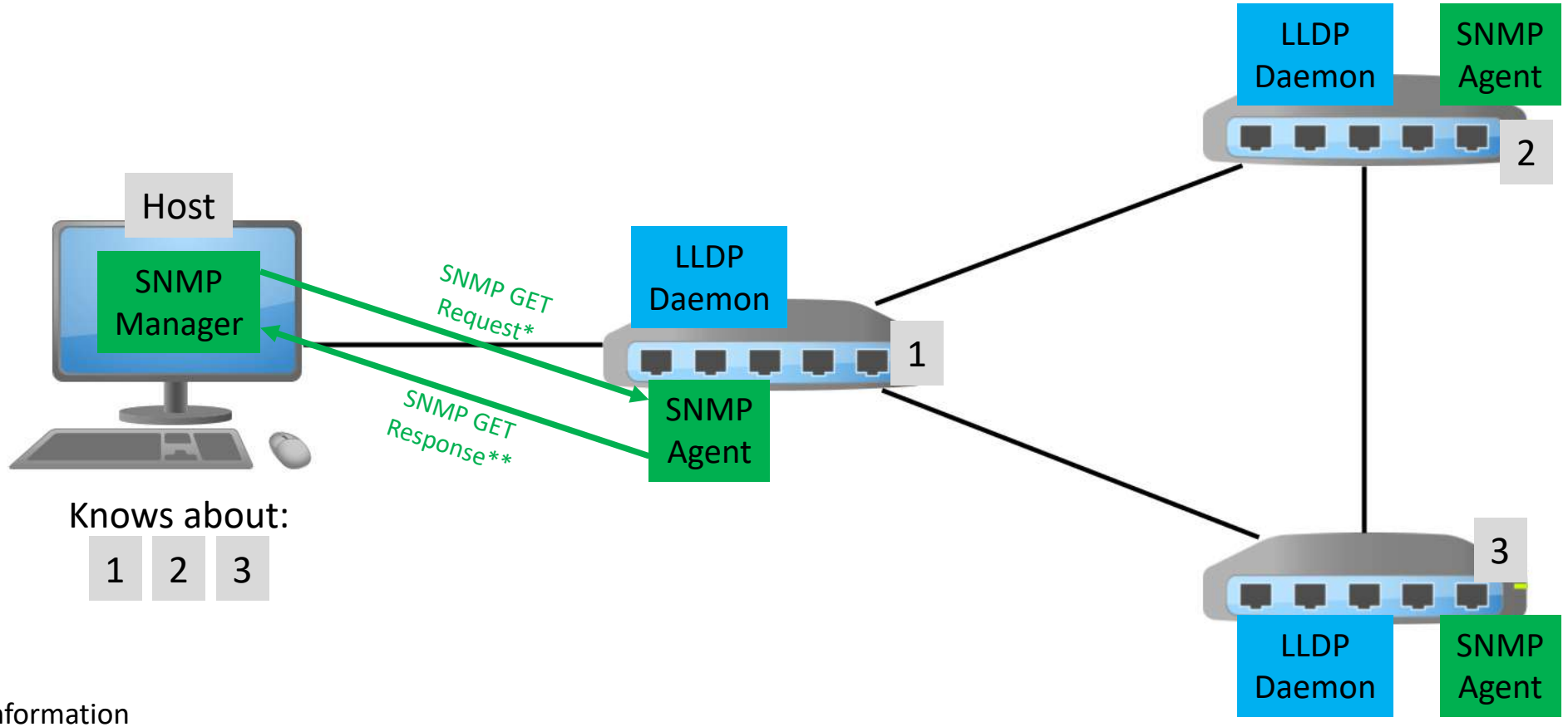
# Project Plan:
# 2. Detecting the Topology



# Project Plan:
# 2. Detecting the Topology

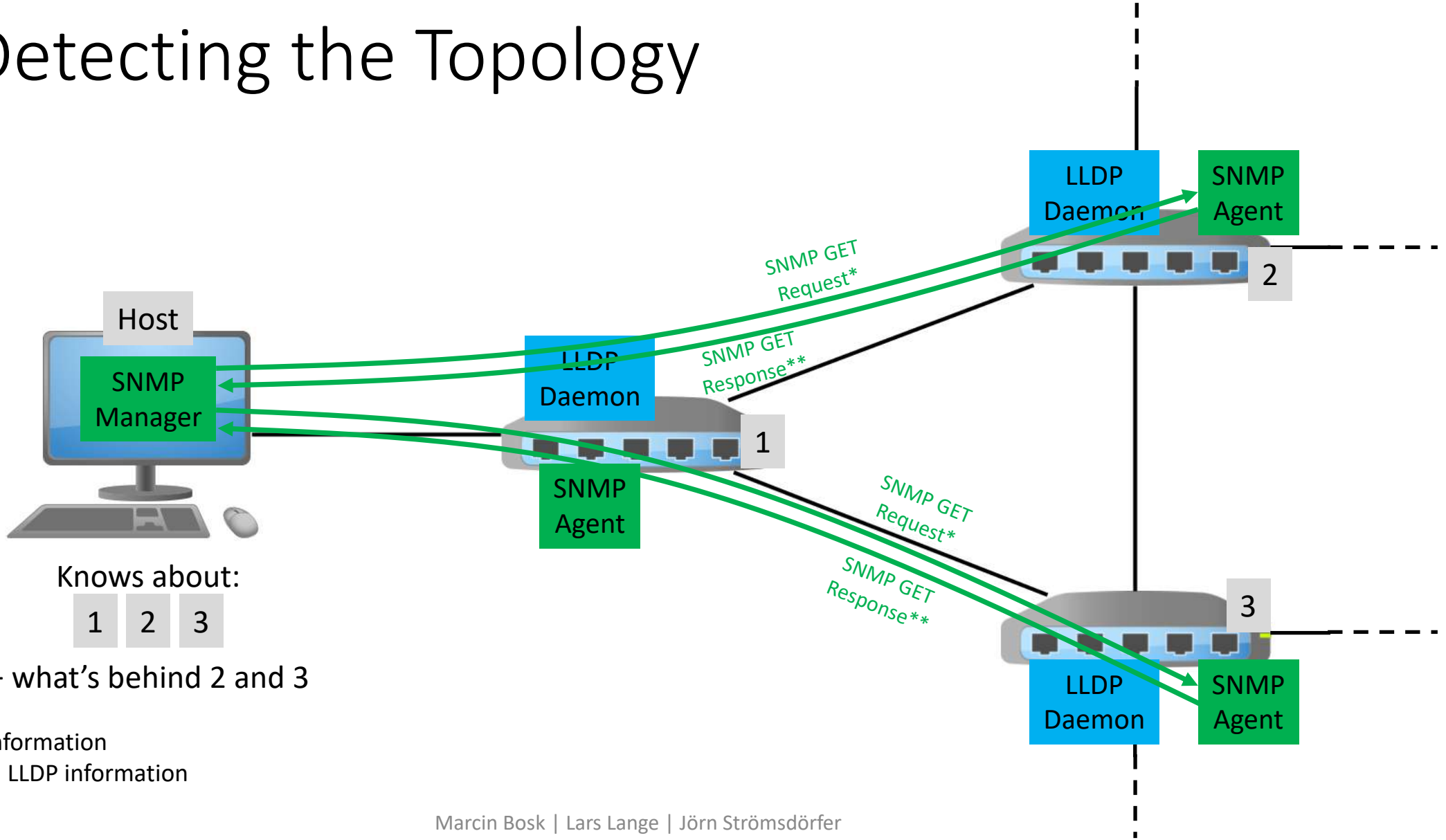


# Project Plan:
# 2. Detecting the Topology




*Request LLDP information
**Response with LLDP information

# Project Plan:
# 2. Detecting the Topology



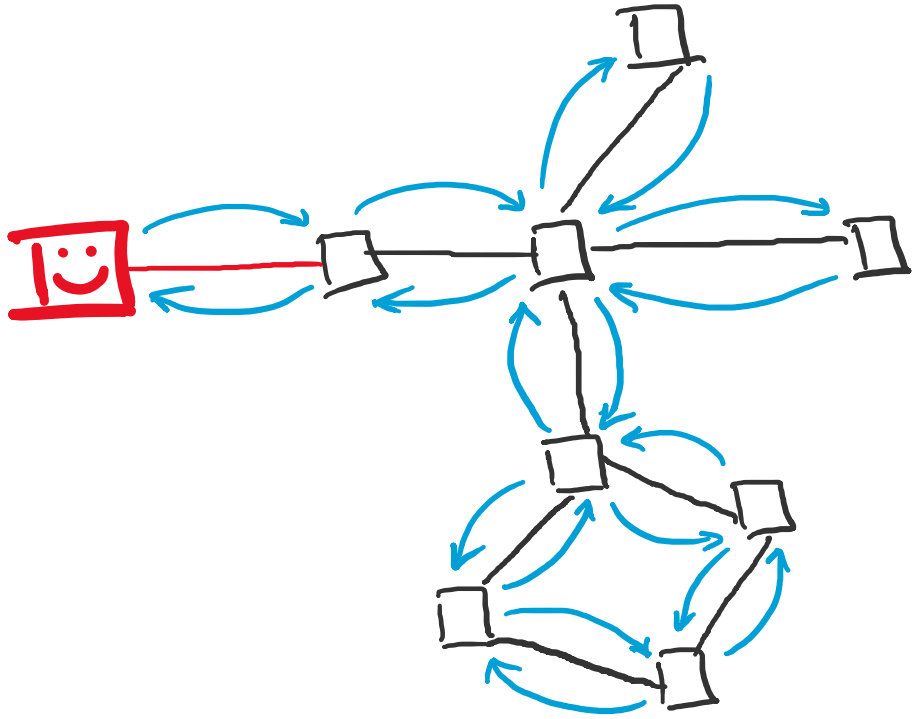

Knows about:

1 2 3

+ what's behind 2 and 3

*Request LLDP information
**Response with LLDP information

# Project Plan:
# 3. Packaging the Topology





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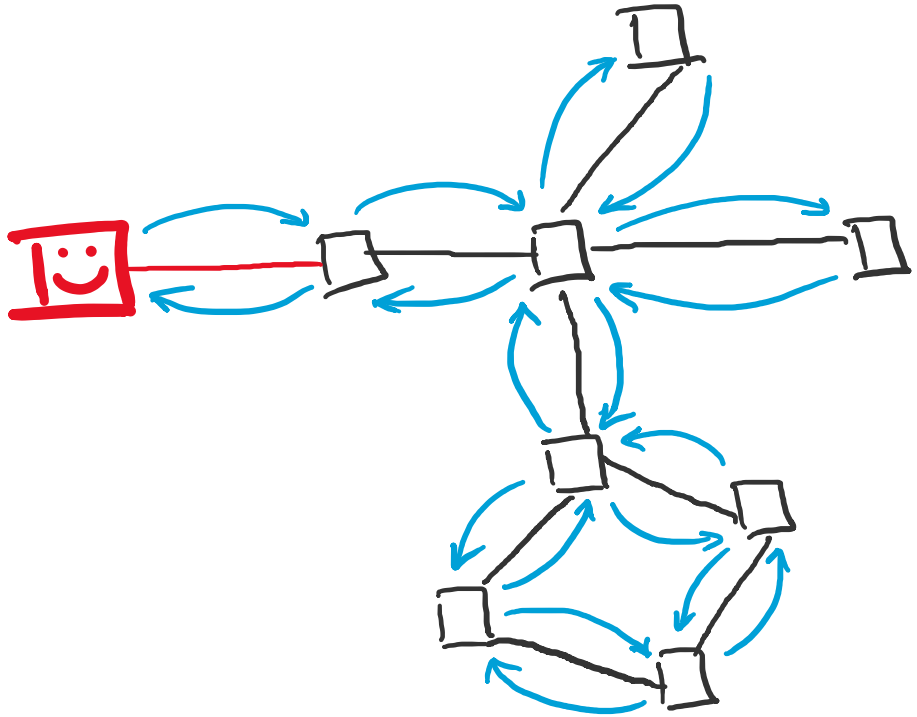
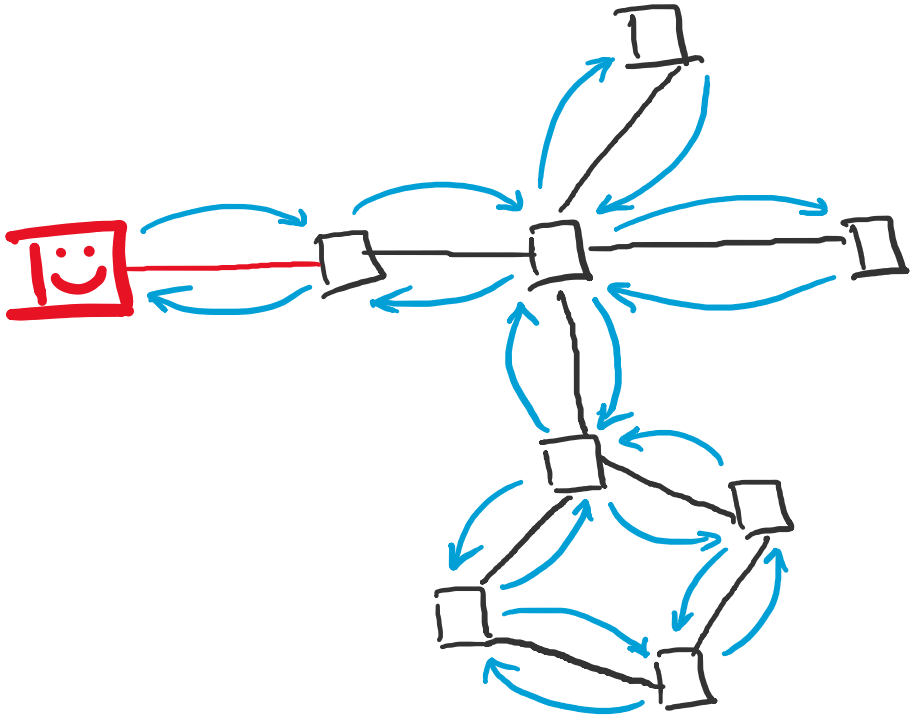
# Project Plan:
# 3. Packaging the Topology



Project Plan:

# 3. Packaging the Topology




```
{
  nodes: [...],
  links: [...]
}
```

Project Plan:

# 4. Displaying the Topology

```
{
  nodes: [...],
  links: [...]
}
```



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# Project Plan:
# 4. Displaying the Topology

```
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}
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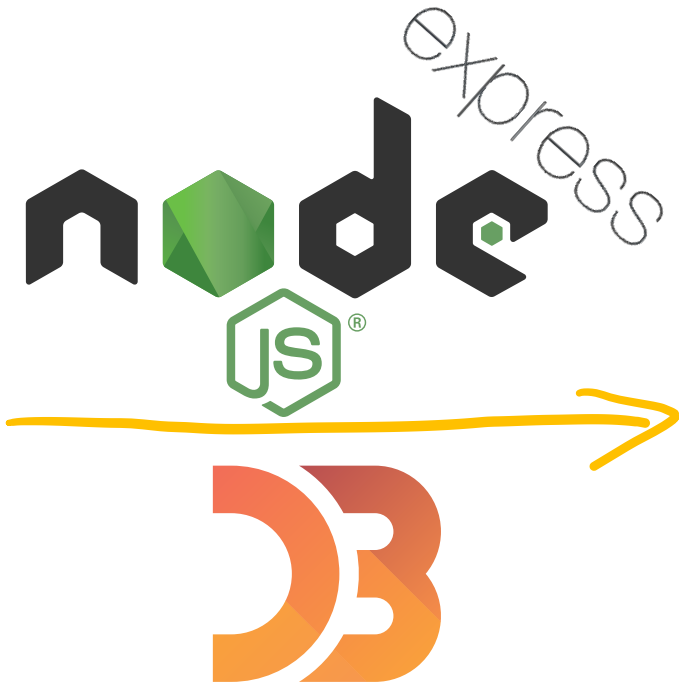

# Project Plan:
# 4. Displaying the Topology

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{
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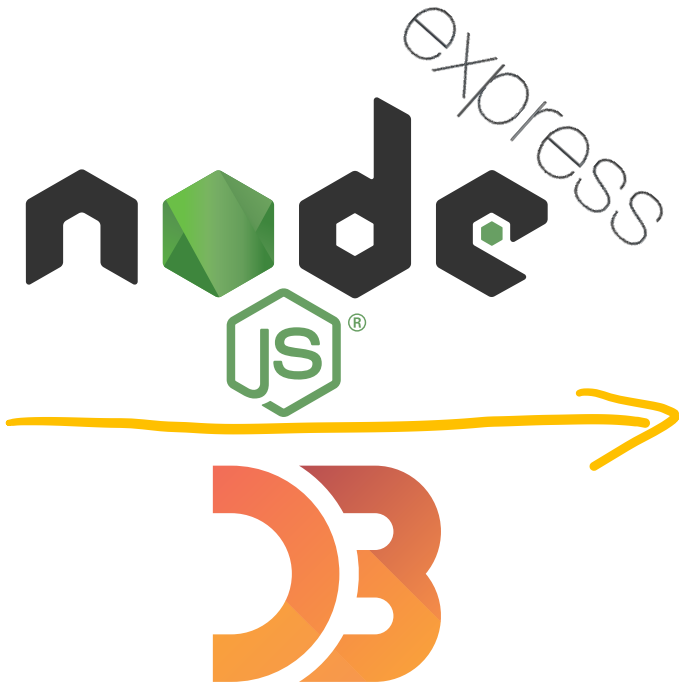
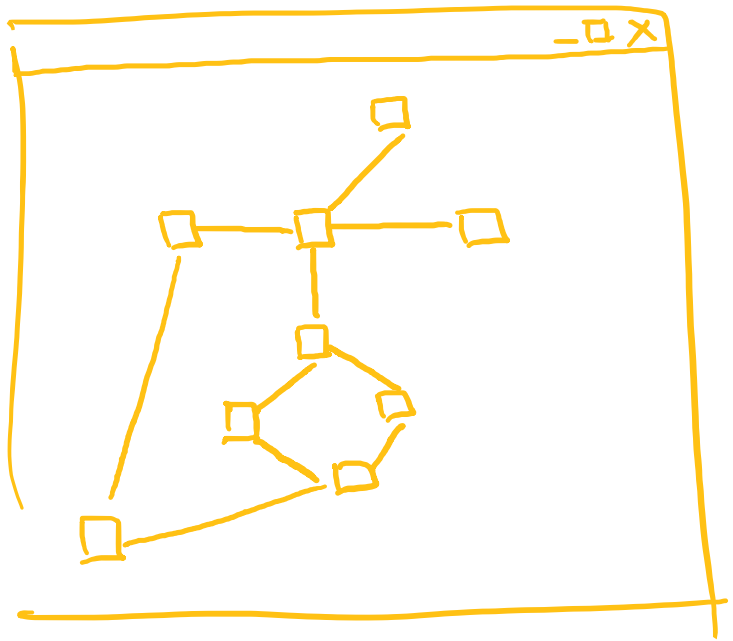
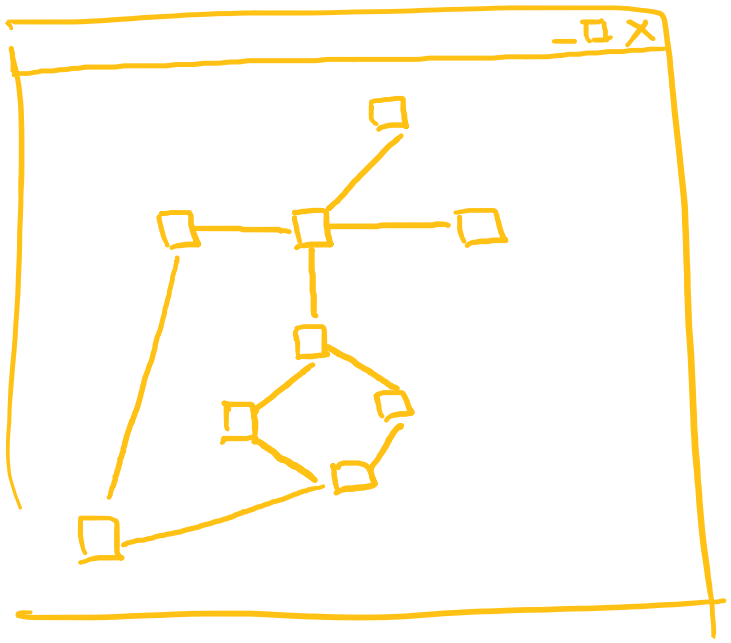


# Project Plan:
# 5. Editing the Topology





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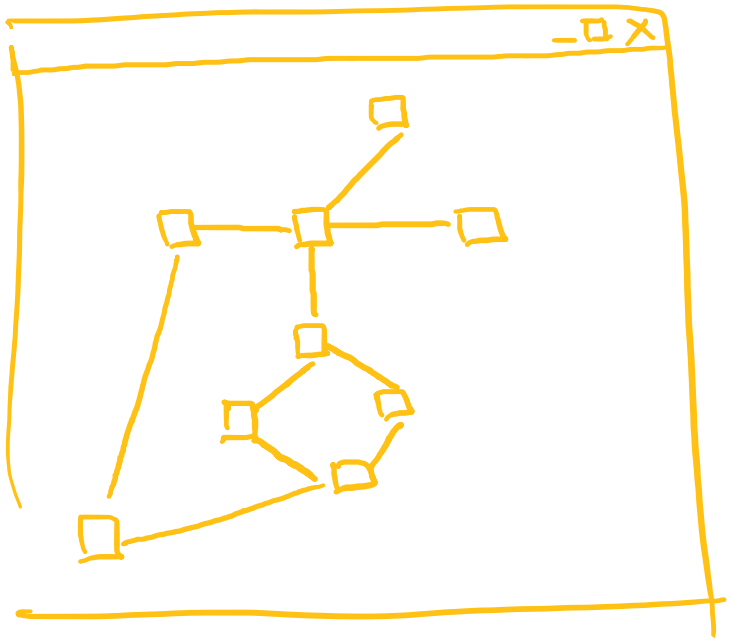
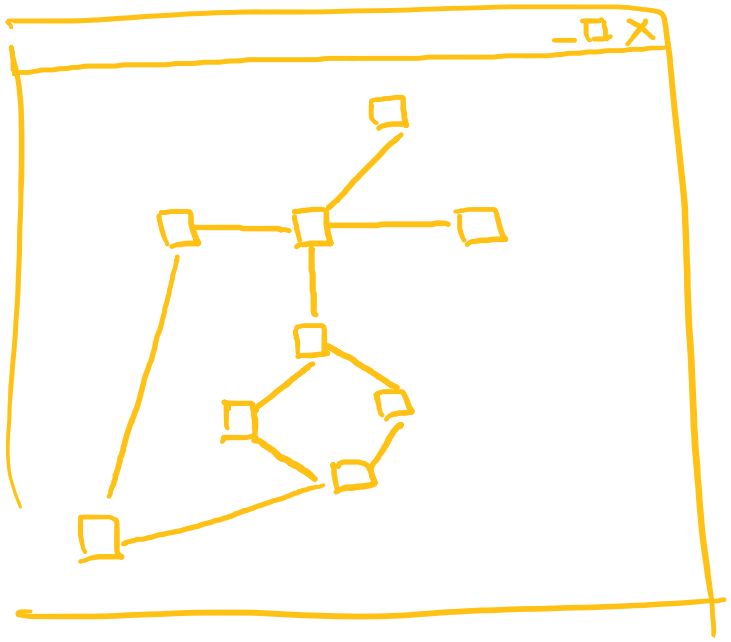
# Project Plan:
# 5. Editing the Topology



Project Plan:

# 5. Editing the Topology




```
{
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```