Understanding Server Technologies for WebRTC

Lisa Larson-Kelley

LearnFromLisa.com

@lisamarienyc

pluralsight

hardcore developer training

Why Do We Need Servers with WebRTC?
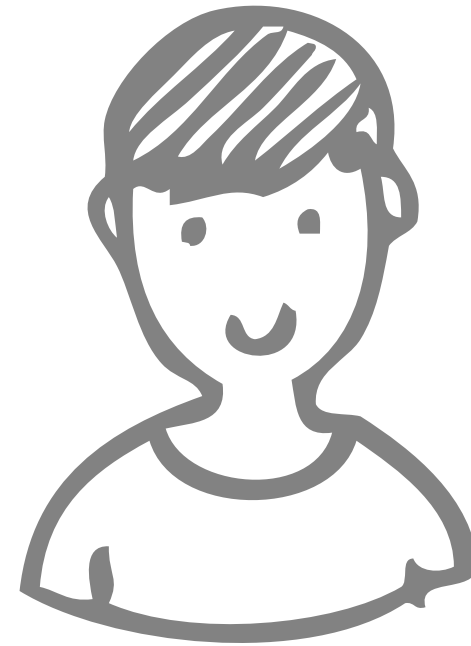
Why Do We Need Servers with WebRTC?
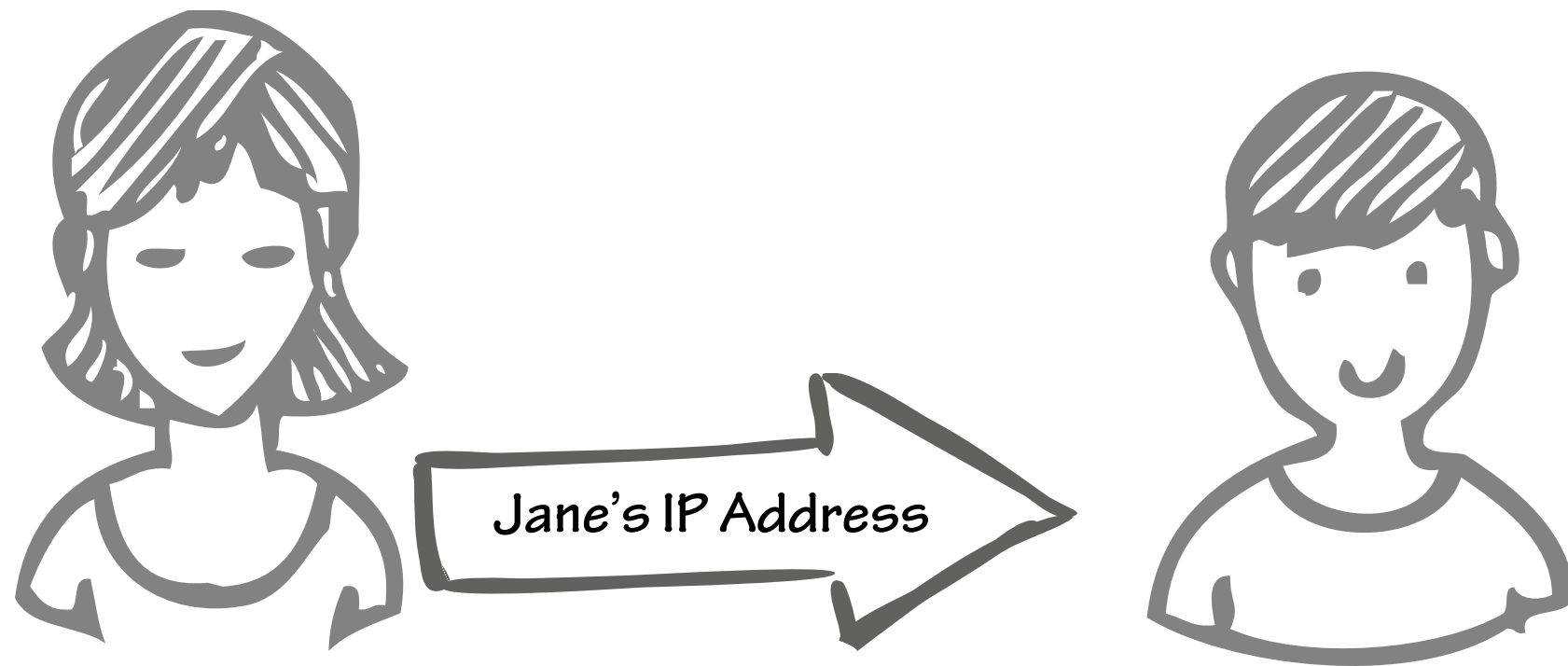
Why Do We Need Servers with WebRTC?

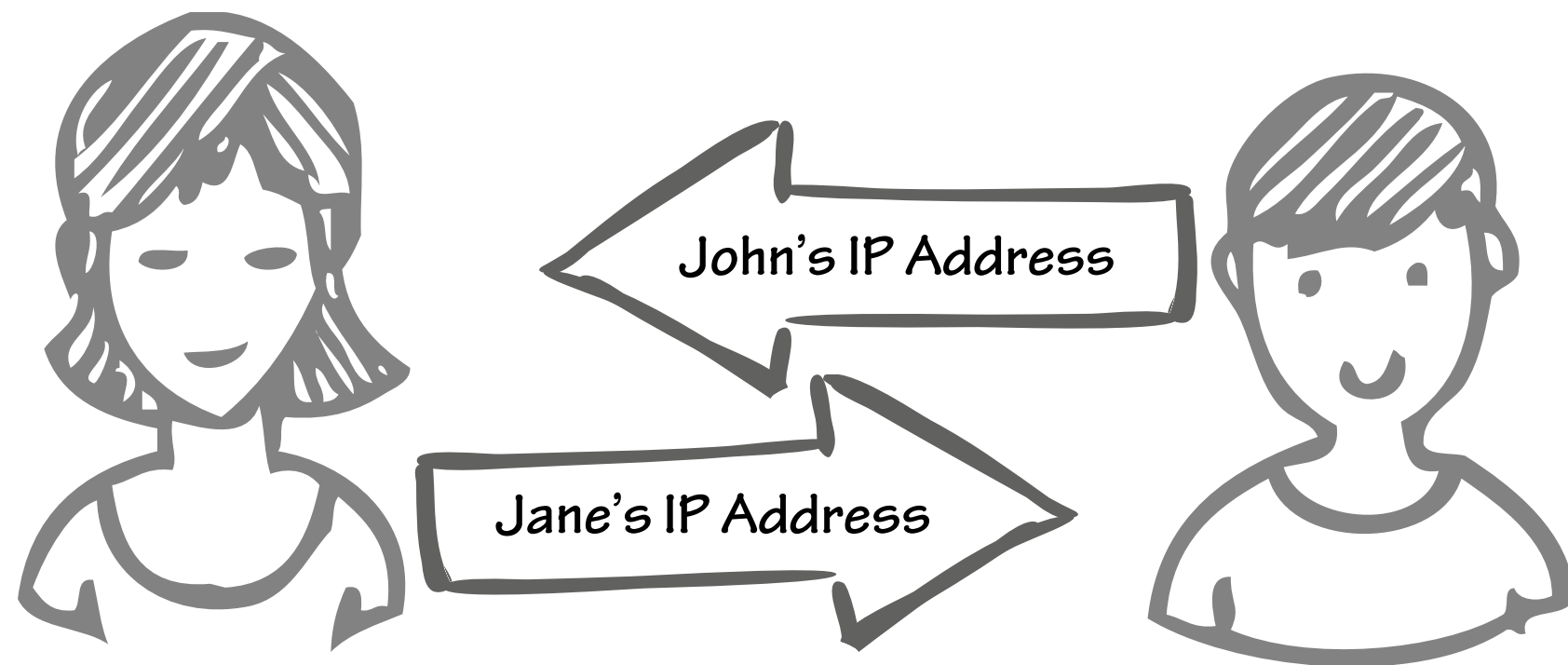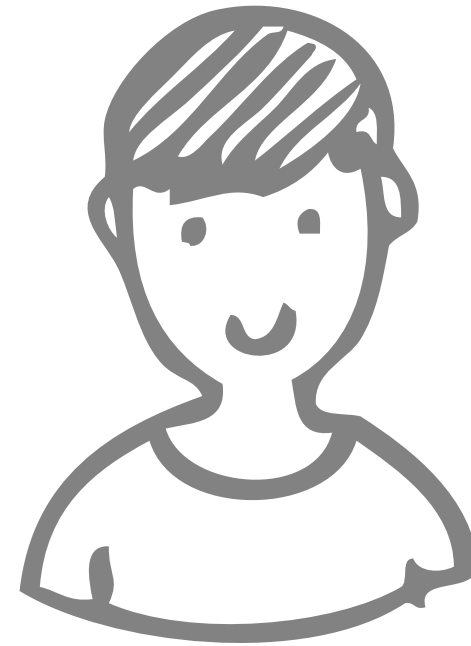# Why Do We Need Servers with WebRTC?

Establishing Peer Connections: An Overview

Establishing Peer Connections: An Overview

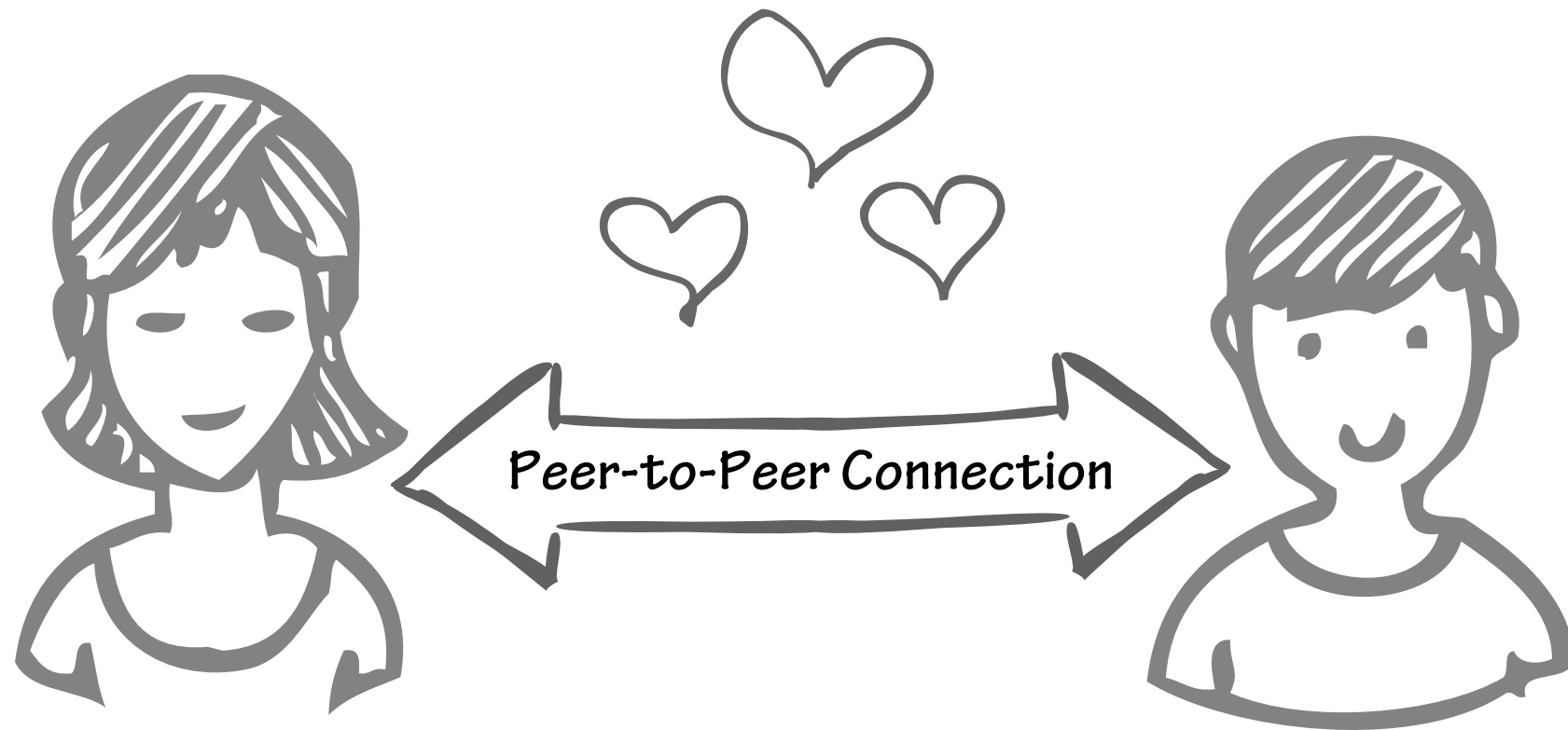# Establishing Peer Connections: An Overview
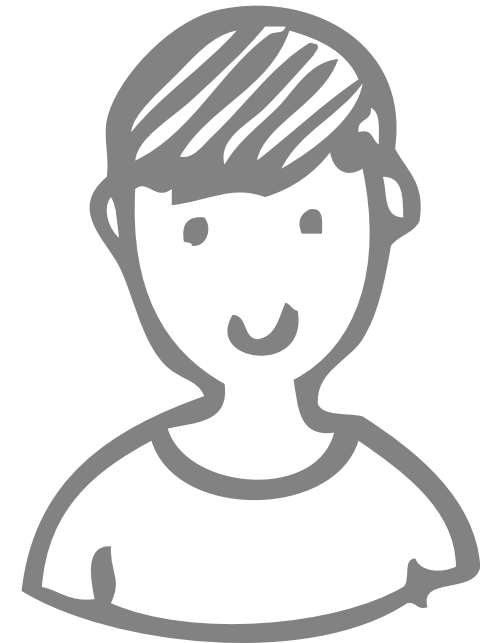
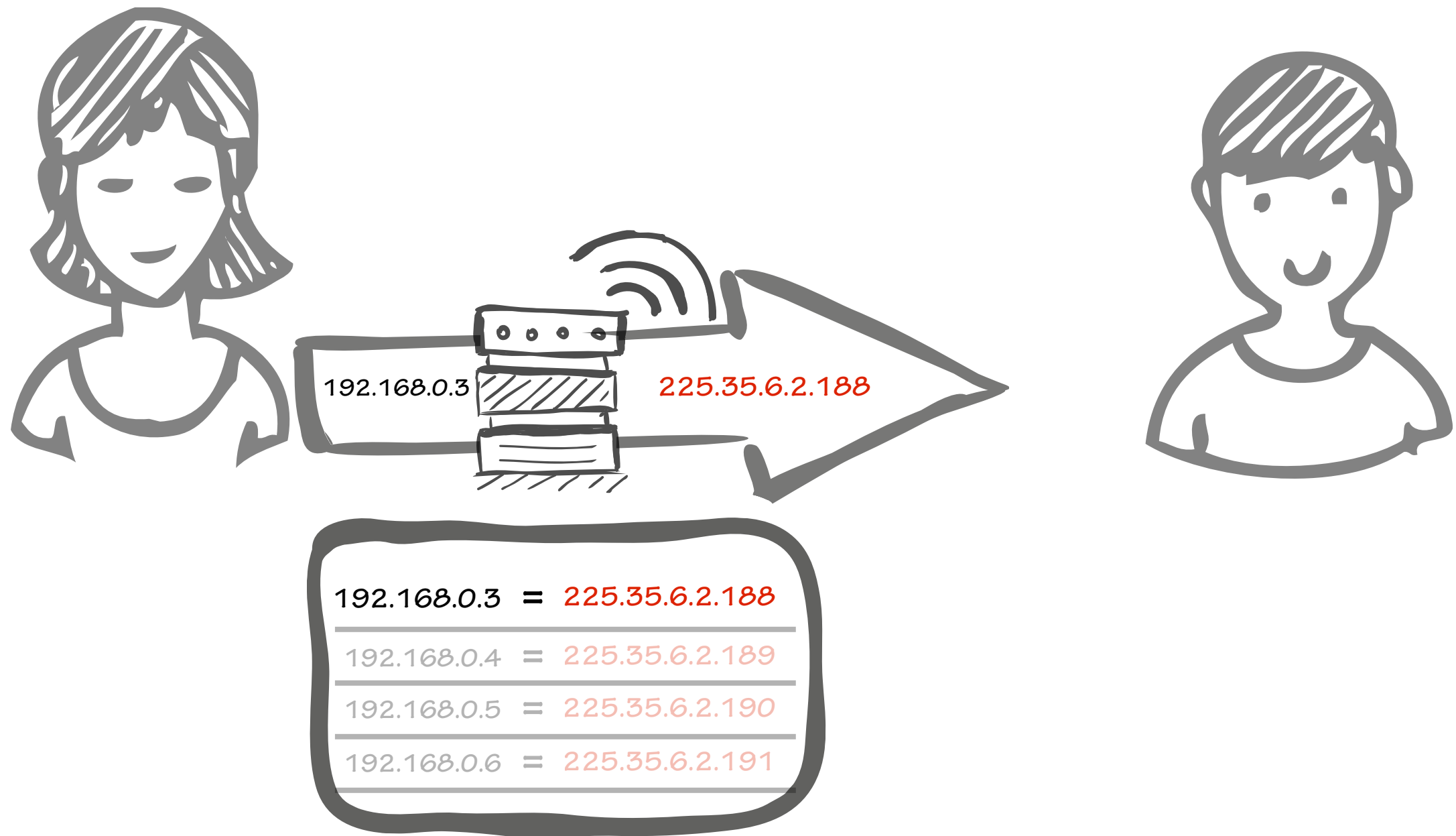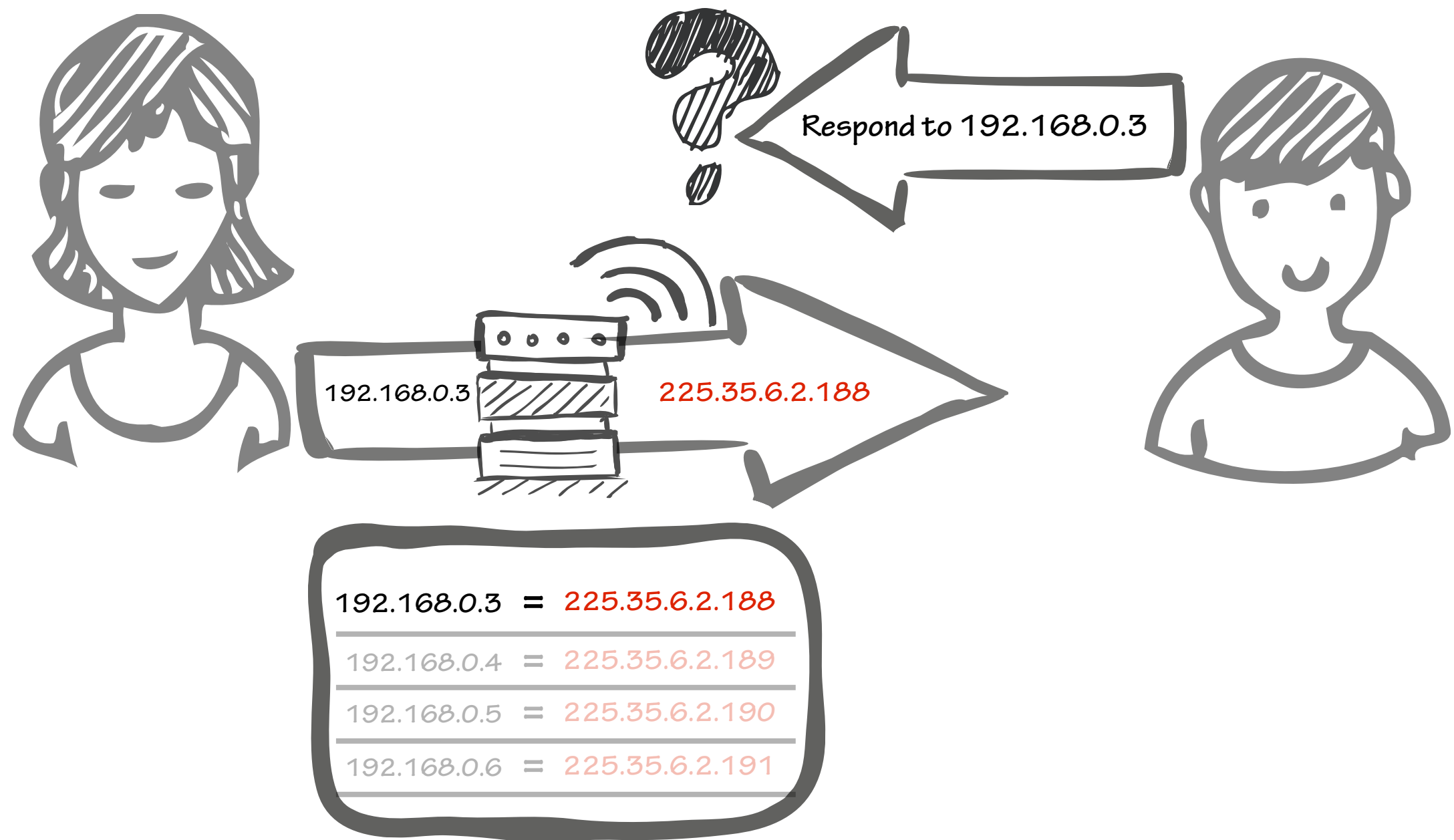# Establishing Peer Connections: An Overview

Establishing Peer Connections: An Overview

Peer-to-Peer Connection

Establishing Peer Connections: An Overview

192.168.0.3

Establishing Peer Connections: An Overview
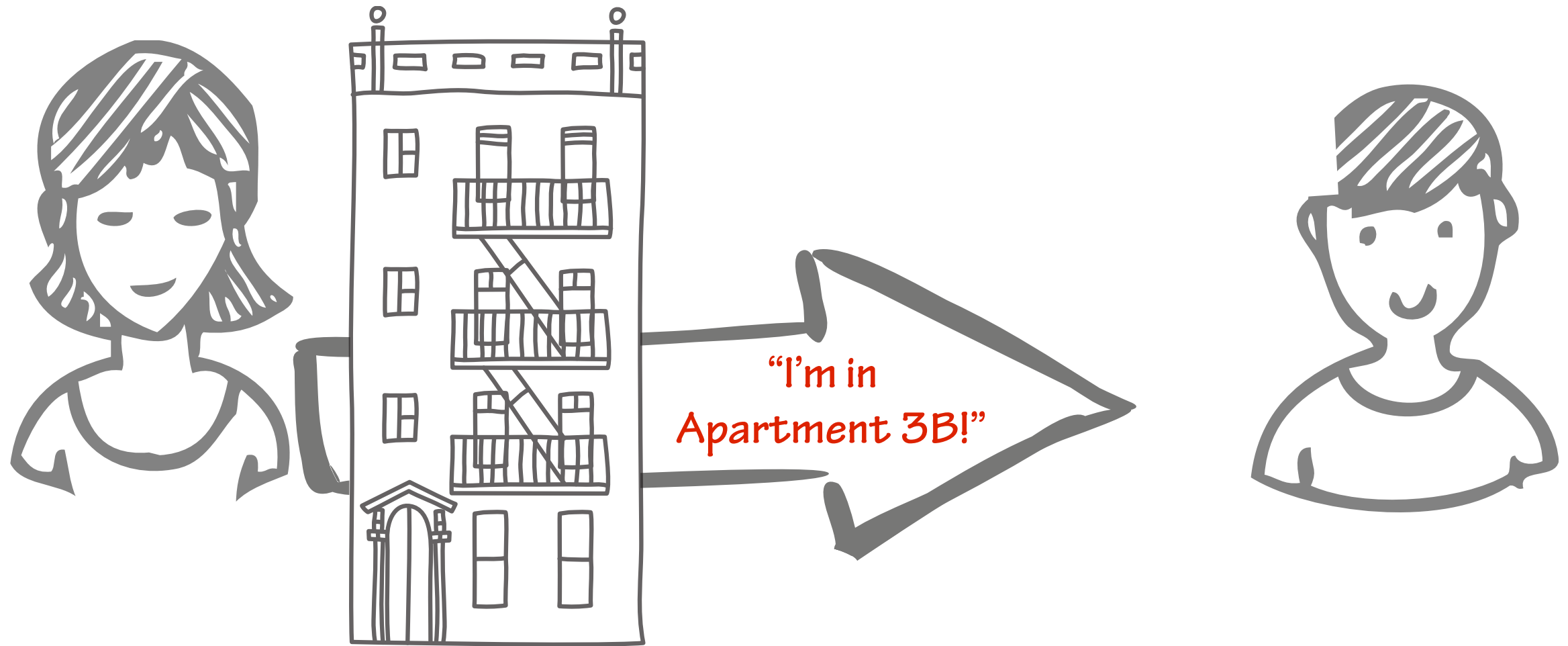
Establishing Peer Connections: An Overview

192.168.0.3   225.35.6.2.188

192.168.0.3 = 225.35.6.2.188
192.168.0.4 = 225.35.6.2.189
192.168.0.5 = 225.35.6.2.190
192.168.0.6 = 225.35.6.2.191

Establishing Peer Connections: An Overview

Respond to 192.168.0.3

192.168.0.3   225.35.6.2.188

192.168.0.3 = 225.35.6.2.188
192.168.0.4 = 225.35.6.2.189
192.168.0.5 = 225.35.6.2.190
192.168.0.6 = 225.35.6.2.191

Establishing Peer Connections: An Overview

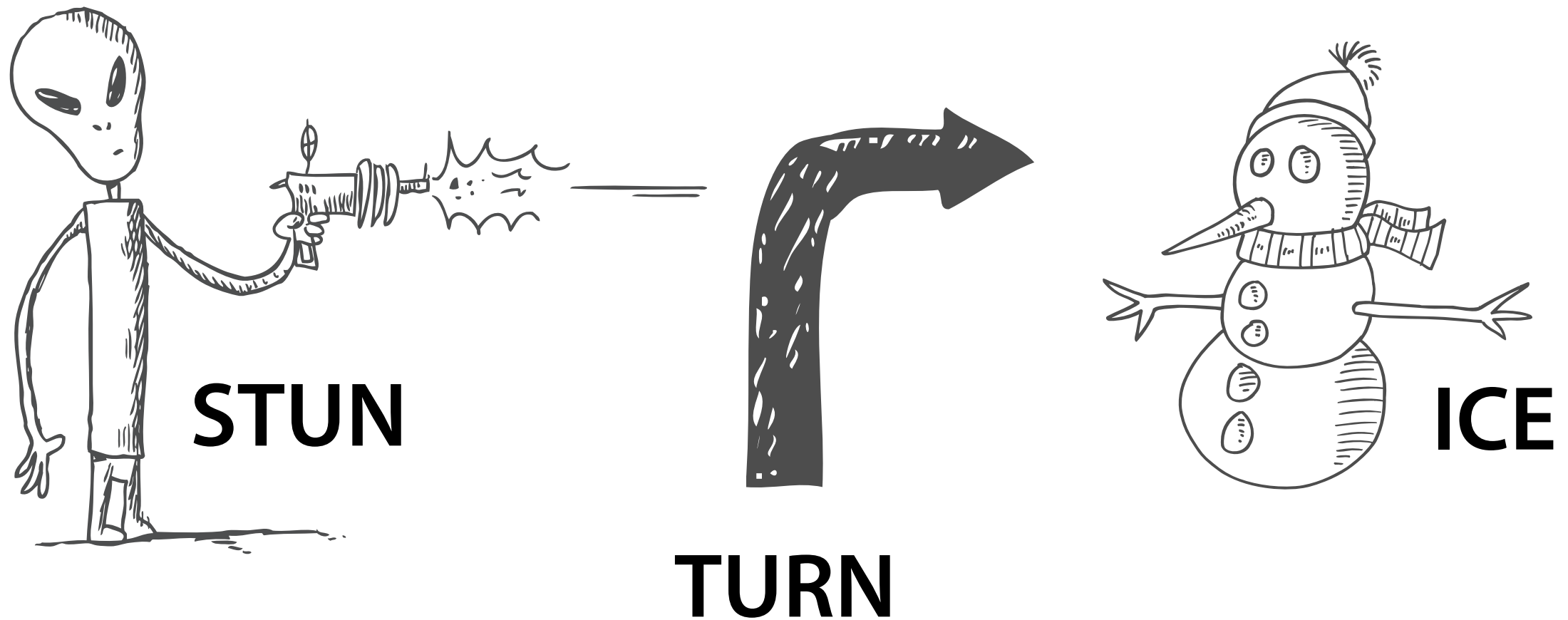# Establishing Peer Connections: An Overview

"I'm in Apartment 3B!"

Establishing Peer Connections: An Overview
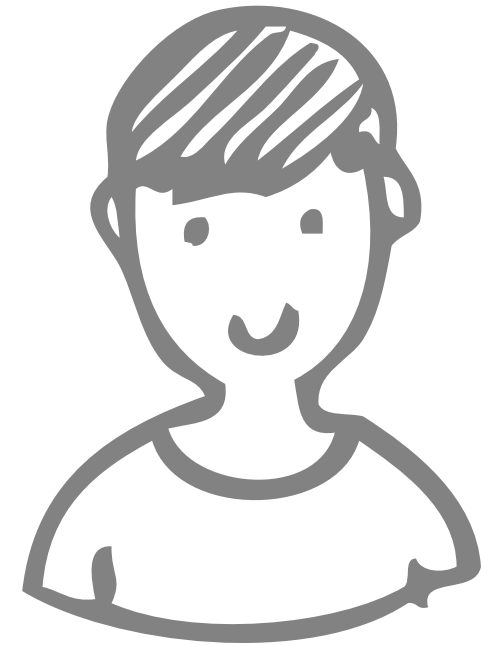
Why Do We Need Servers with WebRTC?

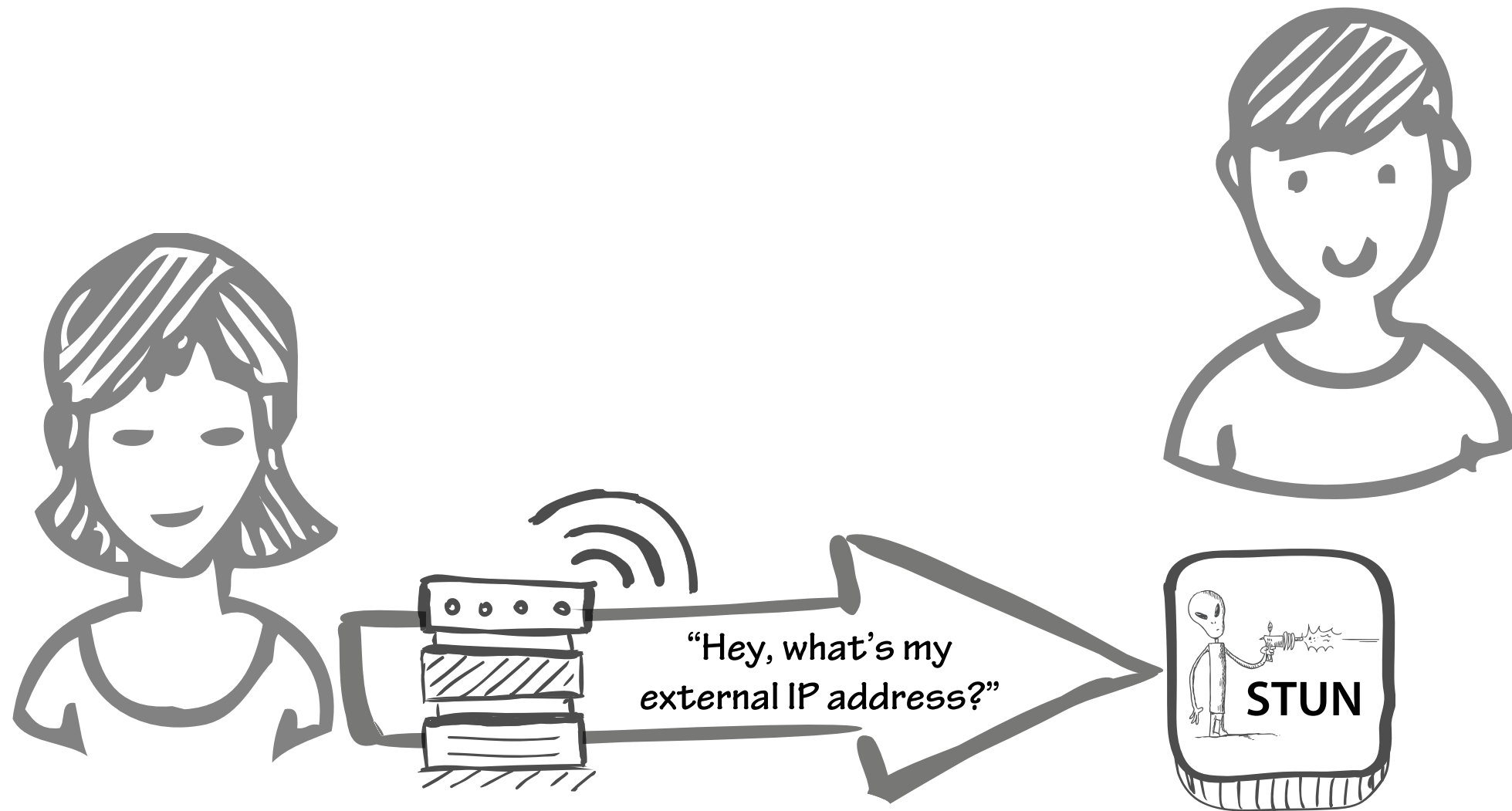**STUN**

TURN

ICE
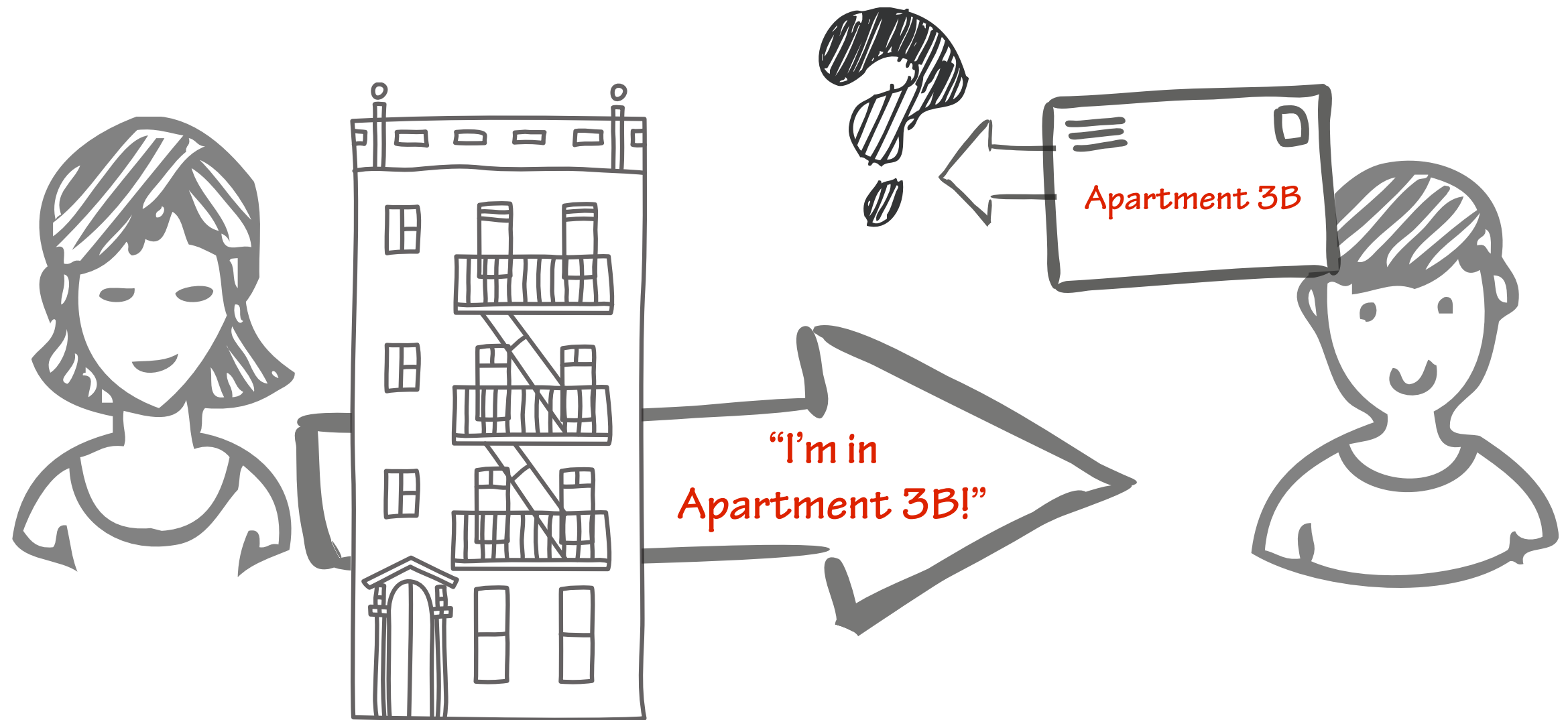
03-02

Introducing STUN, TURN and ICE

STUN
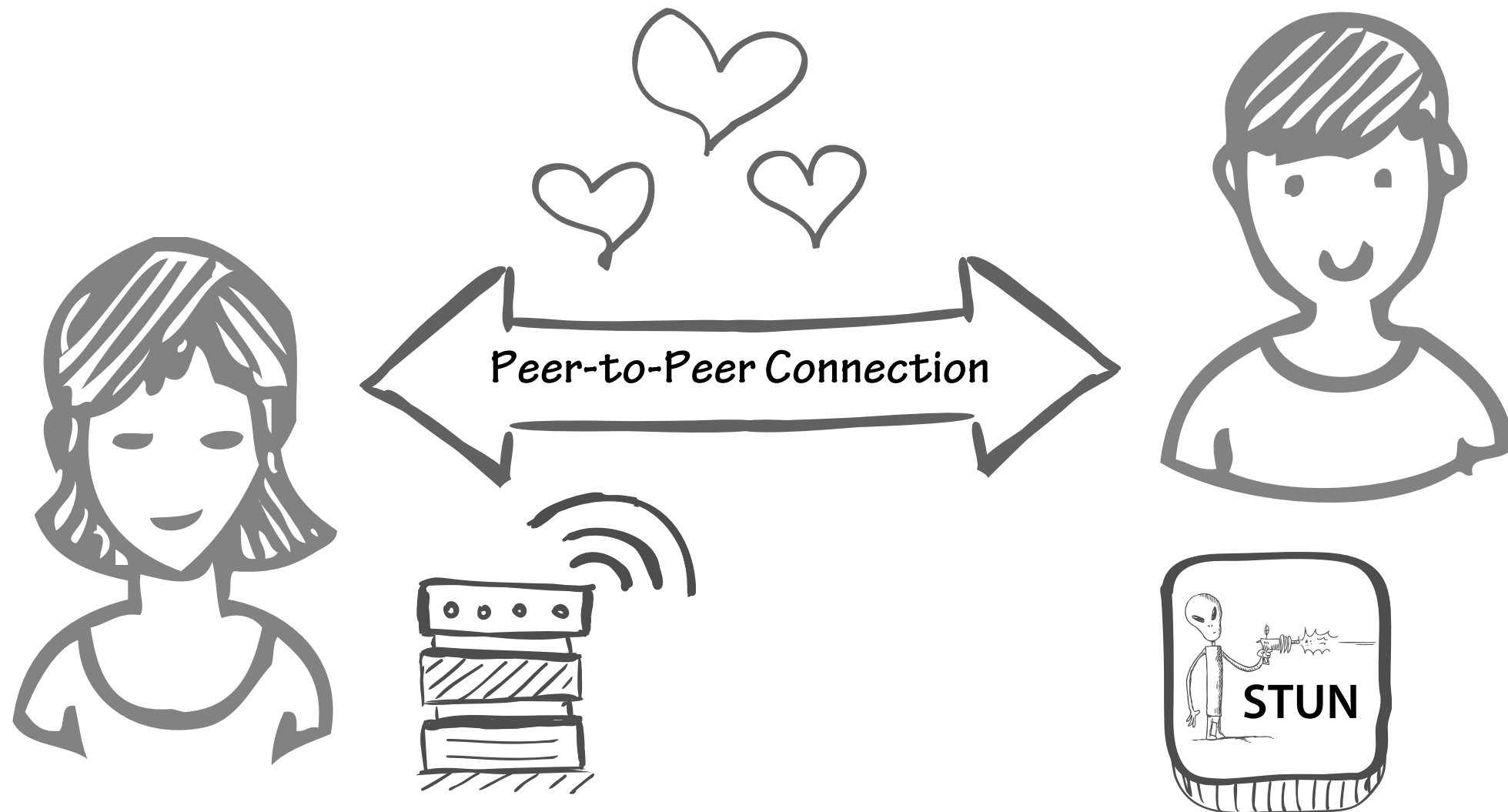
TURN

ICE
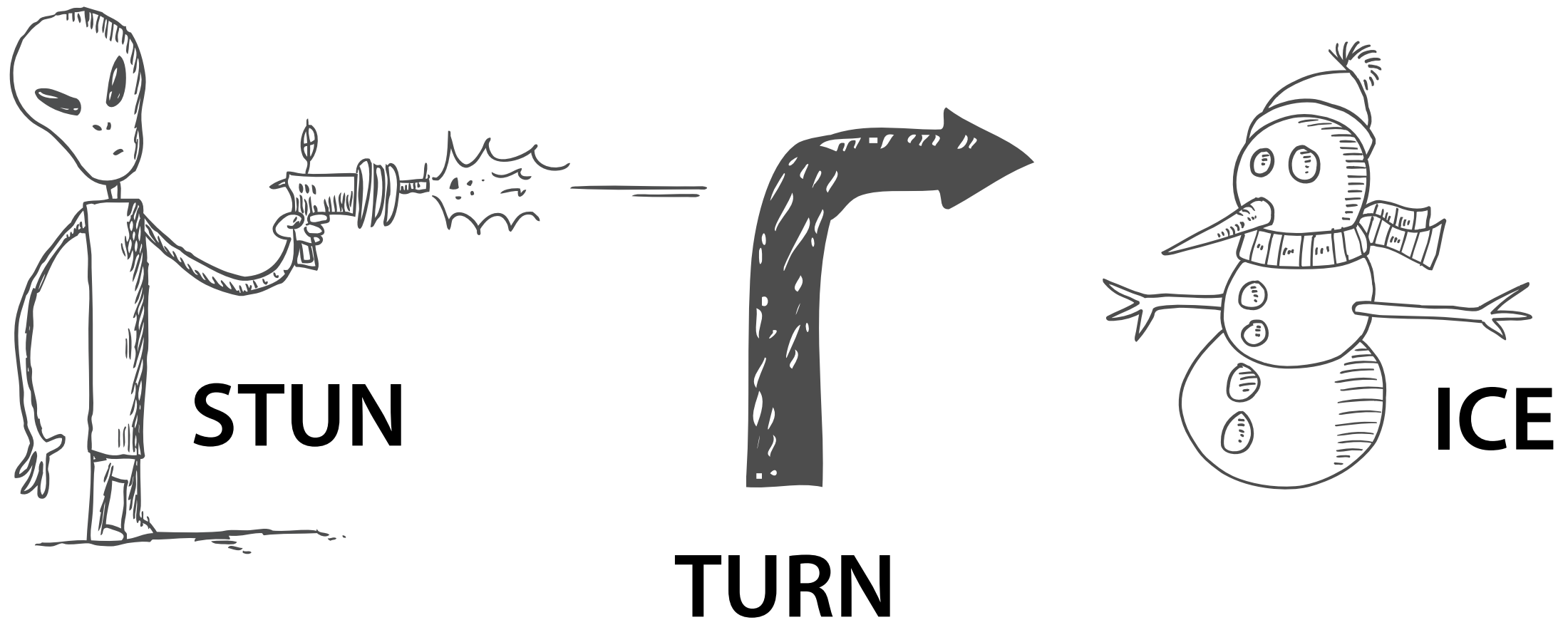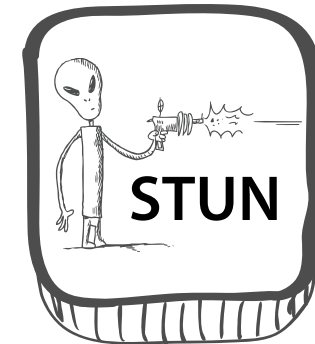
How STUN Servers Work

How STUN Servers Work

"Hey, what's my external IP address?"

STUN

How STUN Servers Work

Your external IP Address is
225.35.6.2.188

STUN

How STUN Servers Work

"My IP address is
225.35.6.2.188

STUN

How STUN Servers Work

"My IP address is 41.19.4.1.255"

STUN

How STUN Servers Work

Peer-to-Peer Connection

STUN

How STUN Servers Work (Sometimes)

Peer-to-Peer Connection

How STUN Servers Work (Sometimes)
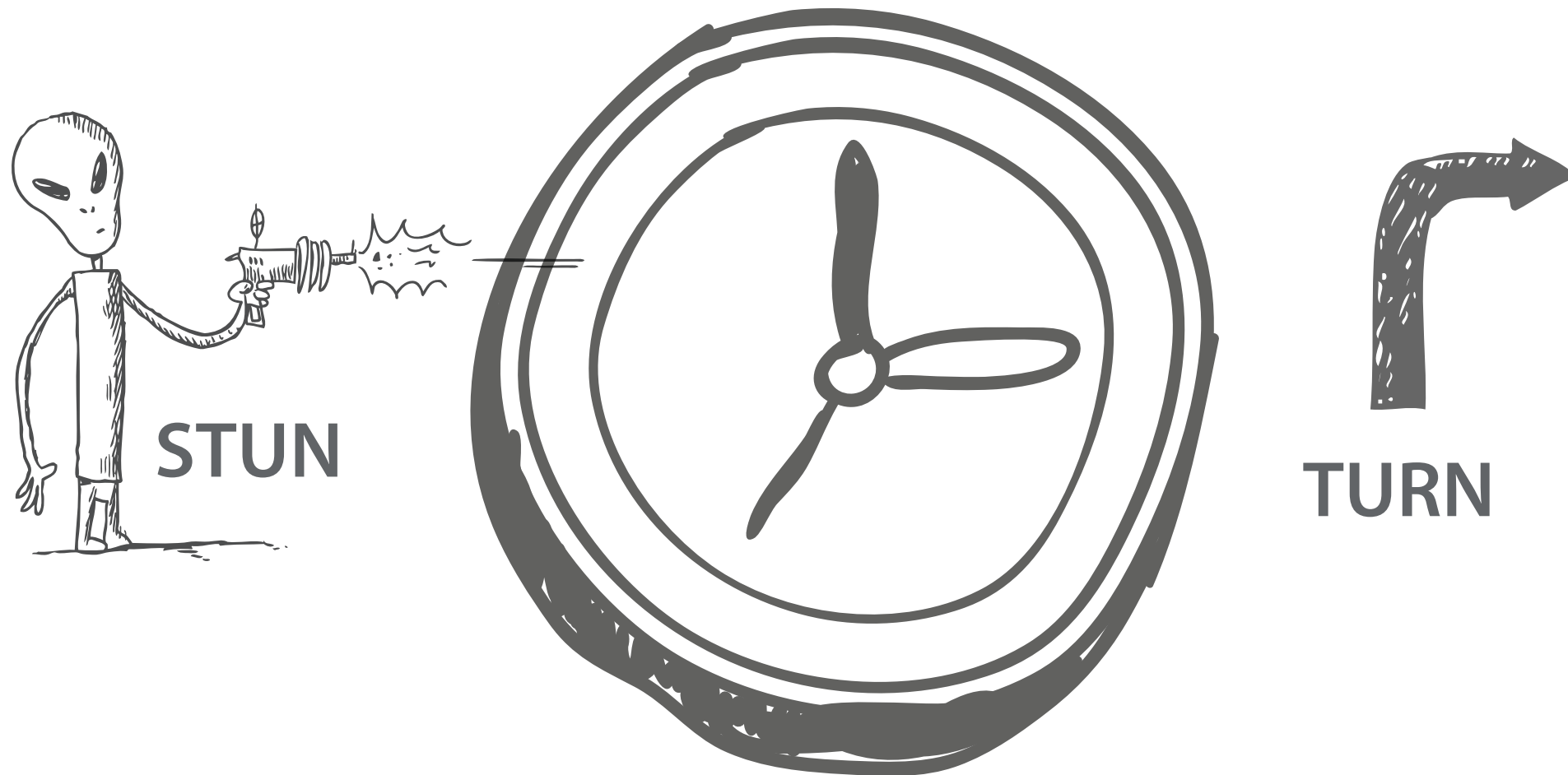

Peer-to-Peer Connection
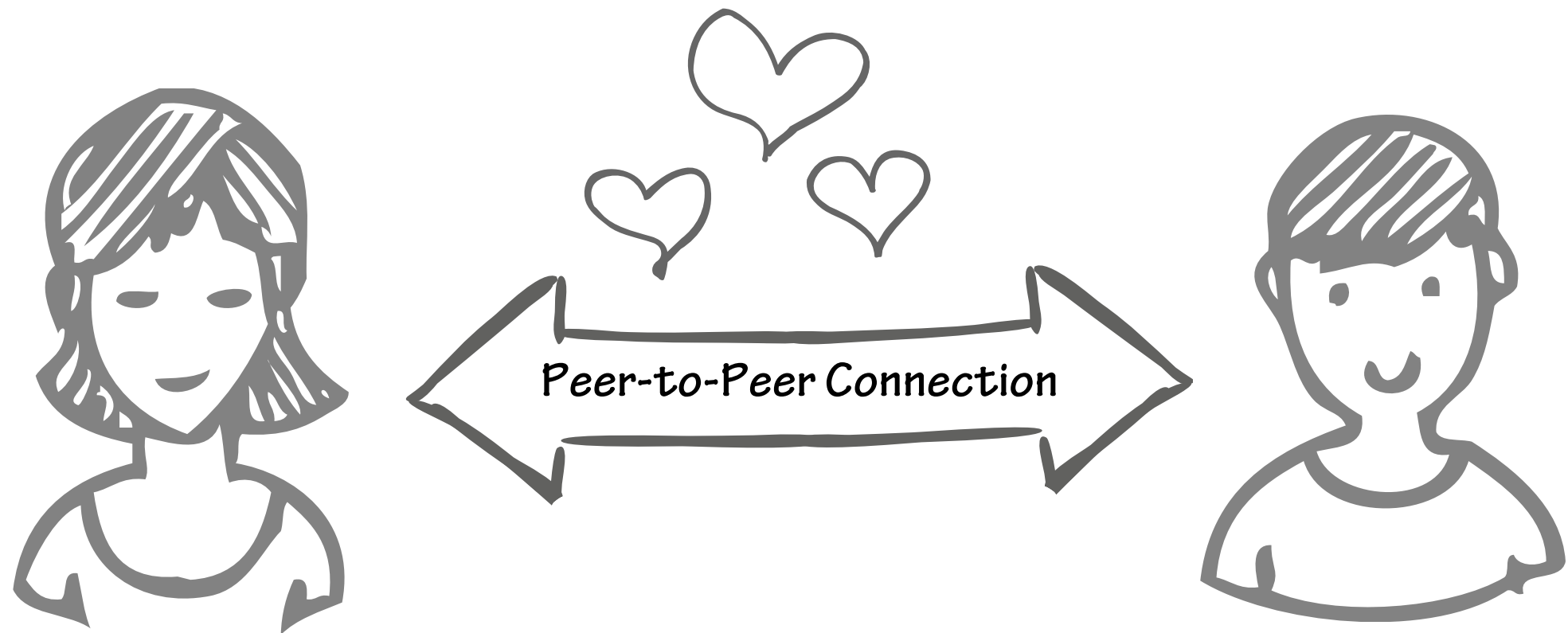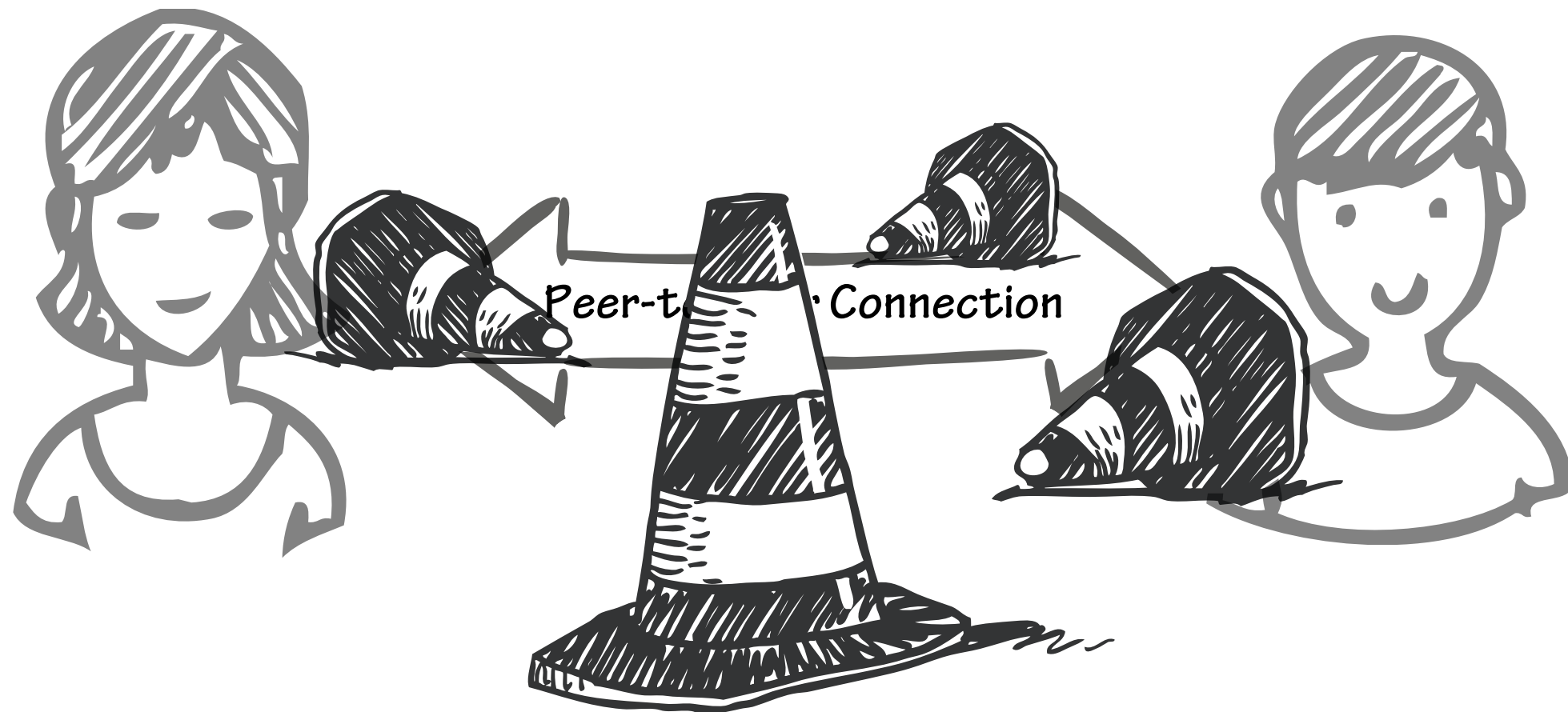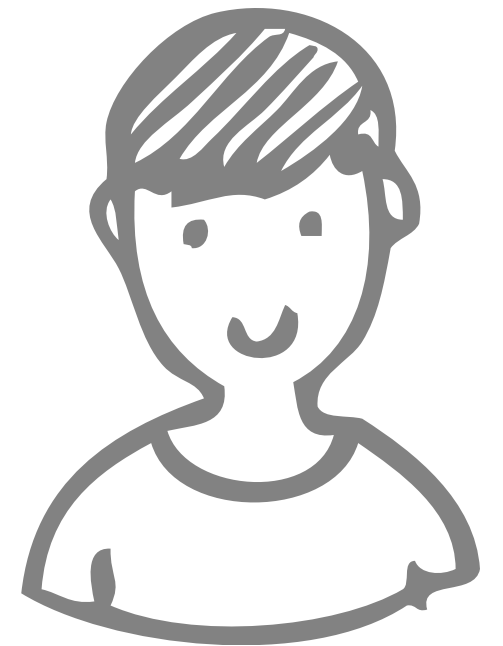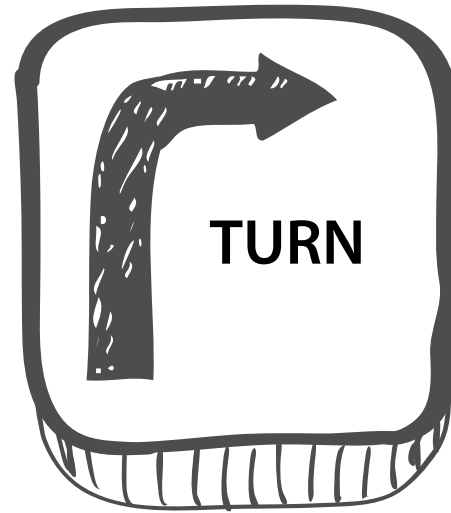
How TURN works

How TURN works

Real-time, Sort Of...

STUN

TURN
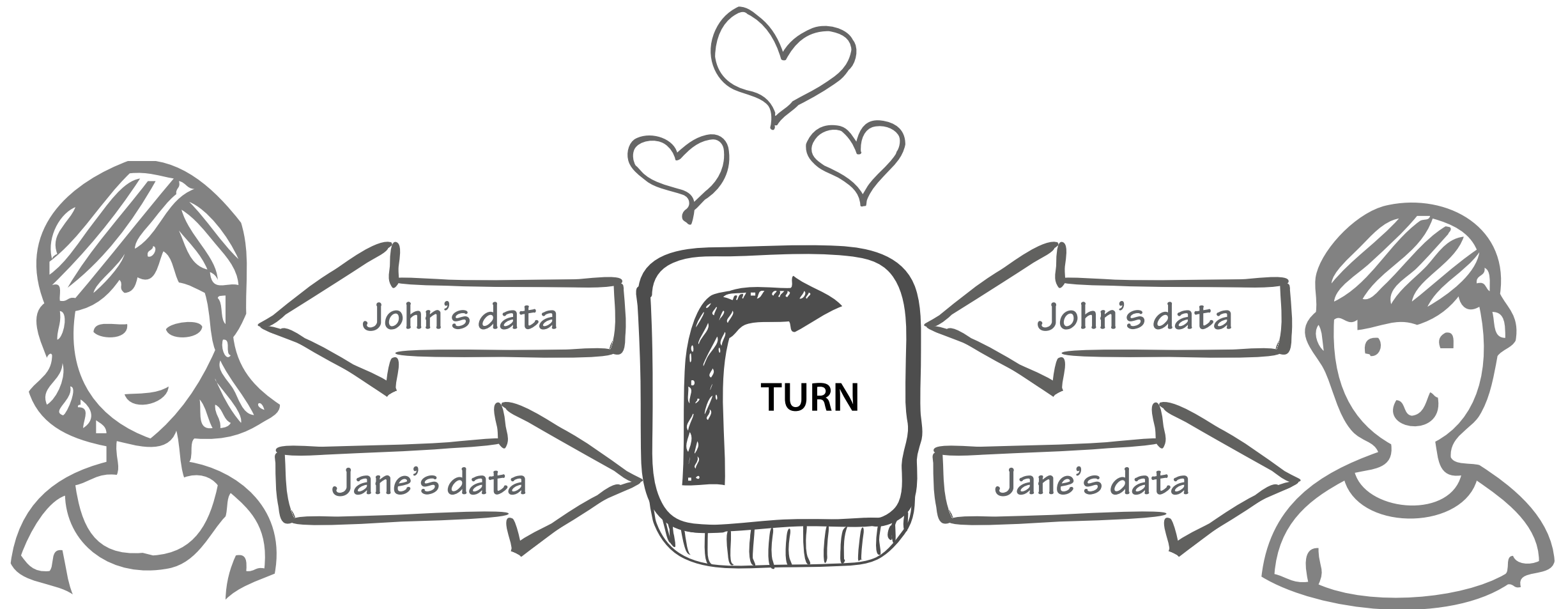
Interactive Connectivity Establishment (ICE)
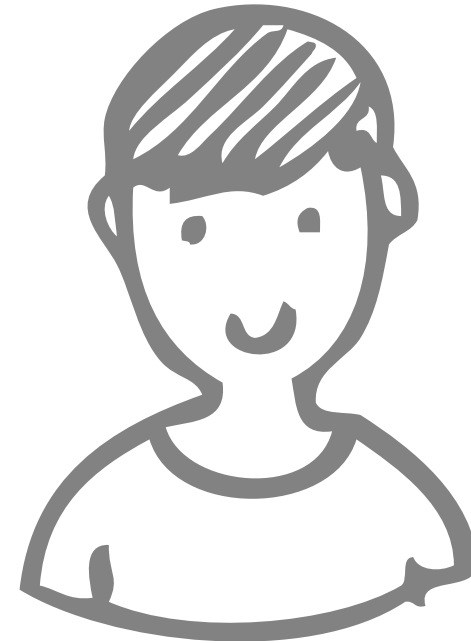
STUN

ICE

TURN

How ICE works

How ICE works
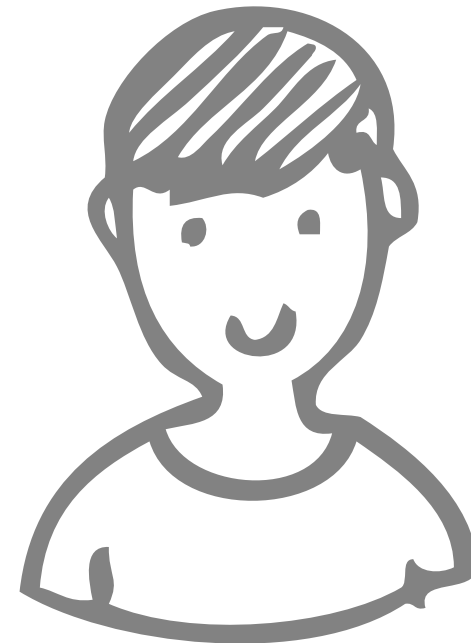
192.168.0.3	**Local IP**	192.168.0.111
225.35.6.2.188	**External IP**	441.19.4.1.255
123.45.6.7.890	**Relay address**	987.65.4.3.210

How ICE works

	Local IP	
192.168.0.3	Local IP	192.168.0.111
225.35.6.2.188	External IP	441.19.4.1.255
123.45.6.7.890	Relay address	987.65.4.3.210

ICE Candidates

How ICE works

192.168.0.3	**Local IP**	192.168.0.111
225.35.6.2.188	**External IP**	441.19.4.1.255
123.45.6.7.890	**Relay address**	987.65.4.3.210

ICE Candidates

How ICE works

225.35.6.2.188

192.168.0.3	**Local IP**	192.168.0.111
225.35.6.2.188	**External IP**	441.19.4.1.255
123.45.6.7.890	**Relay address**	987.65.4.3.210
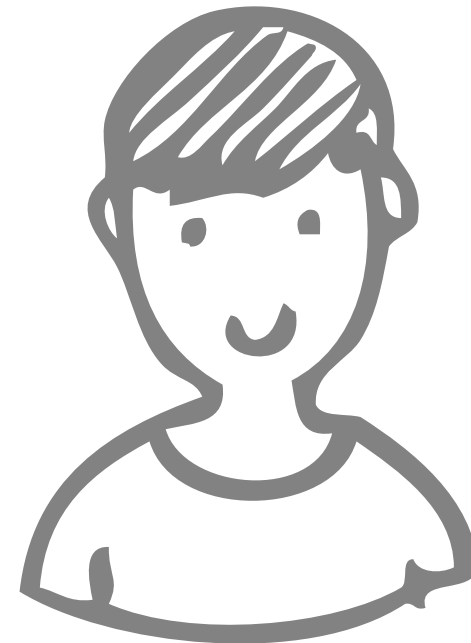
ICE Candidates

How ICE works

987.65.4.3.210

225.35.6.2.188

192.168.0.3	**Local IP**	192.168.0.111
225.35.6.2.188	**External IP**	441.19.4.1.255
123.45.6.7.890	**Relay address**	987.65.4.3.210
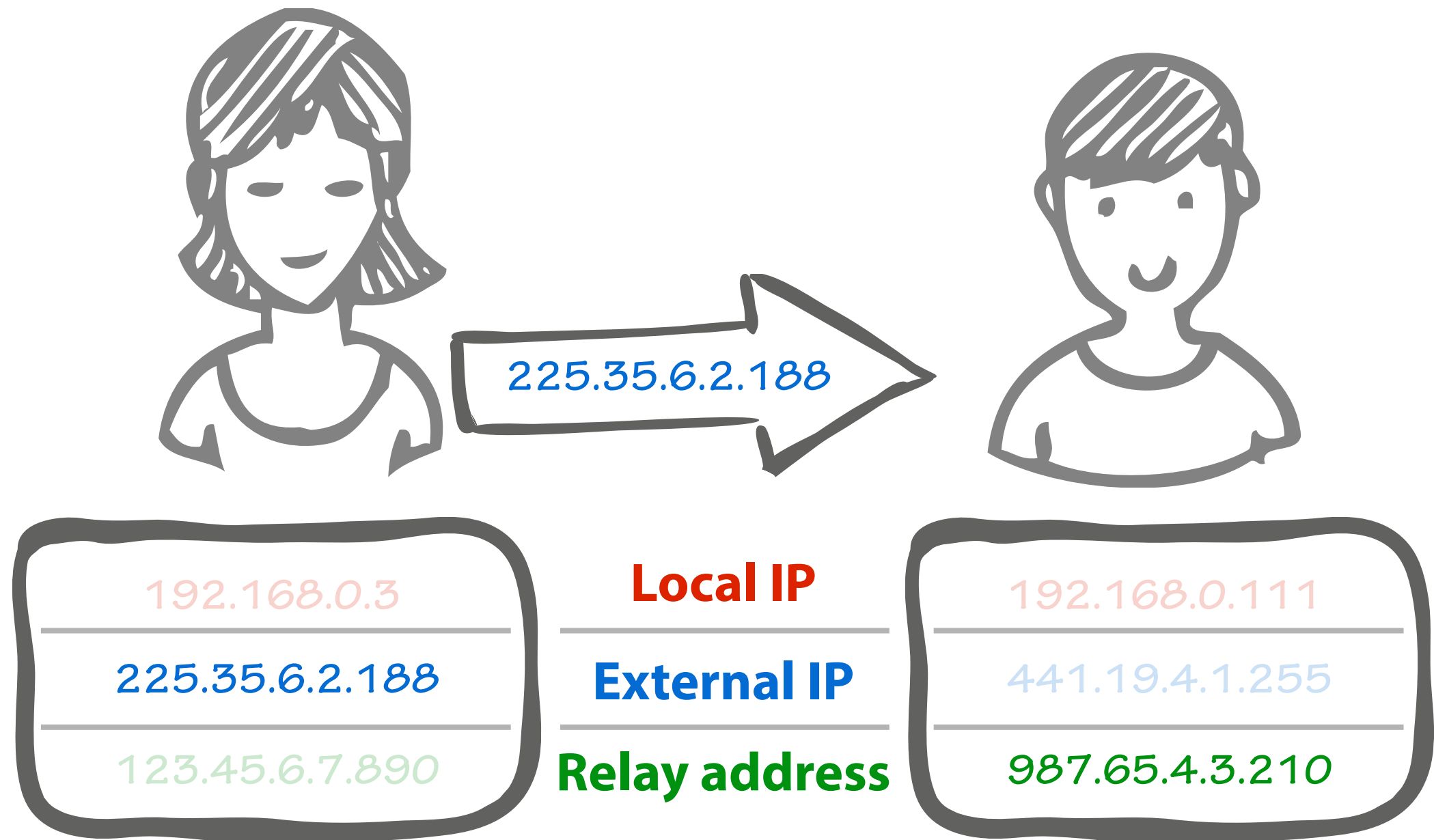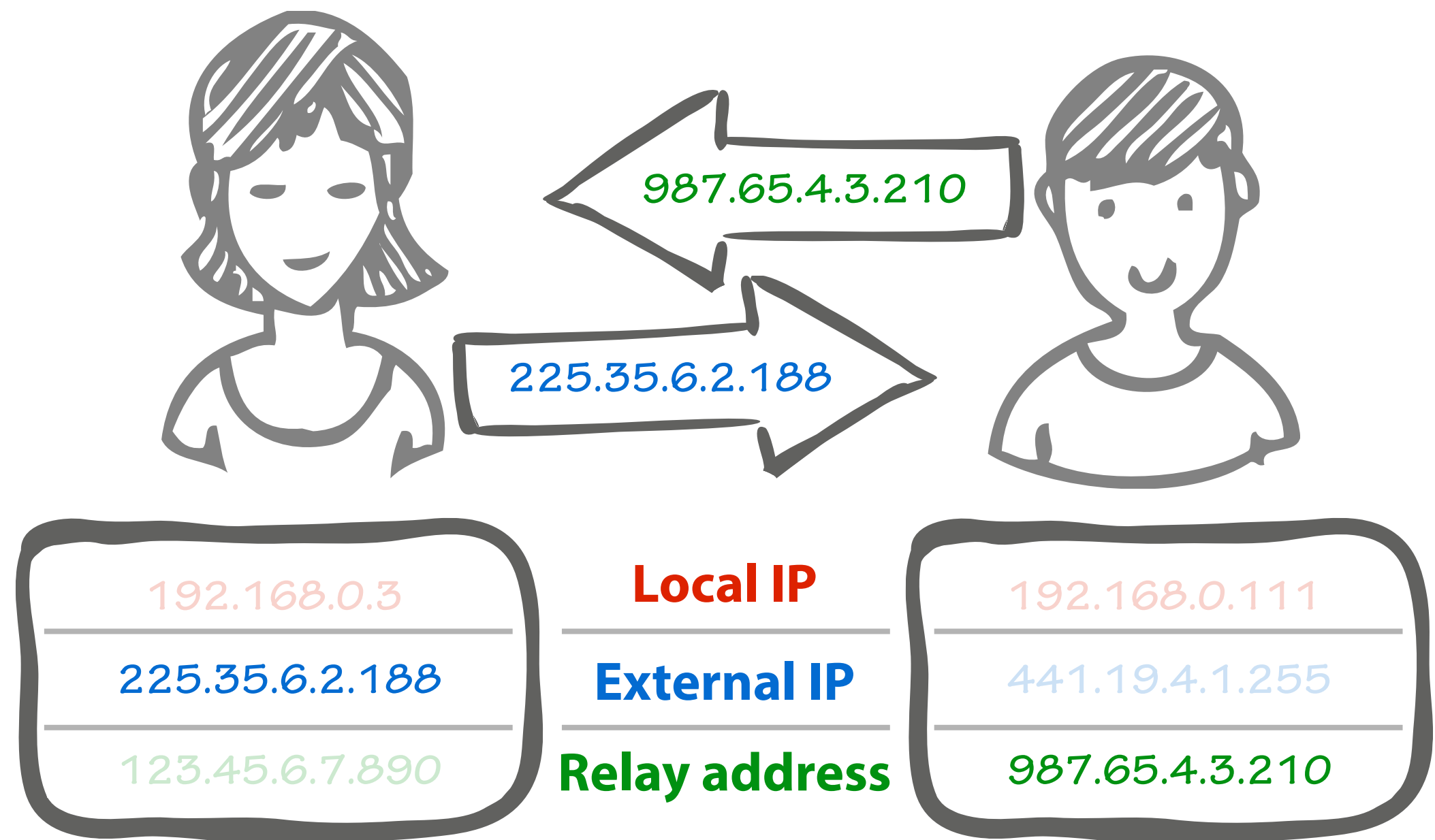
ICE Candidates

How ICE works
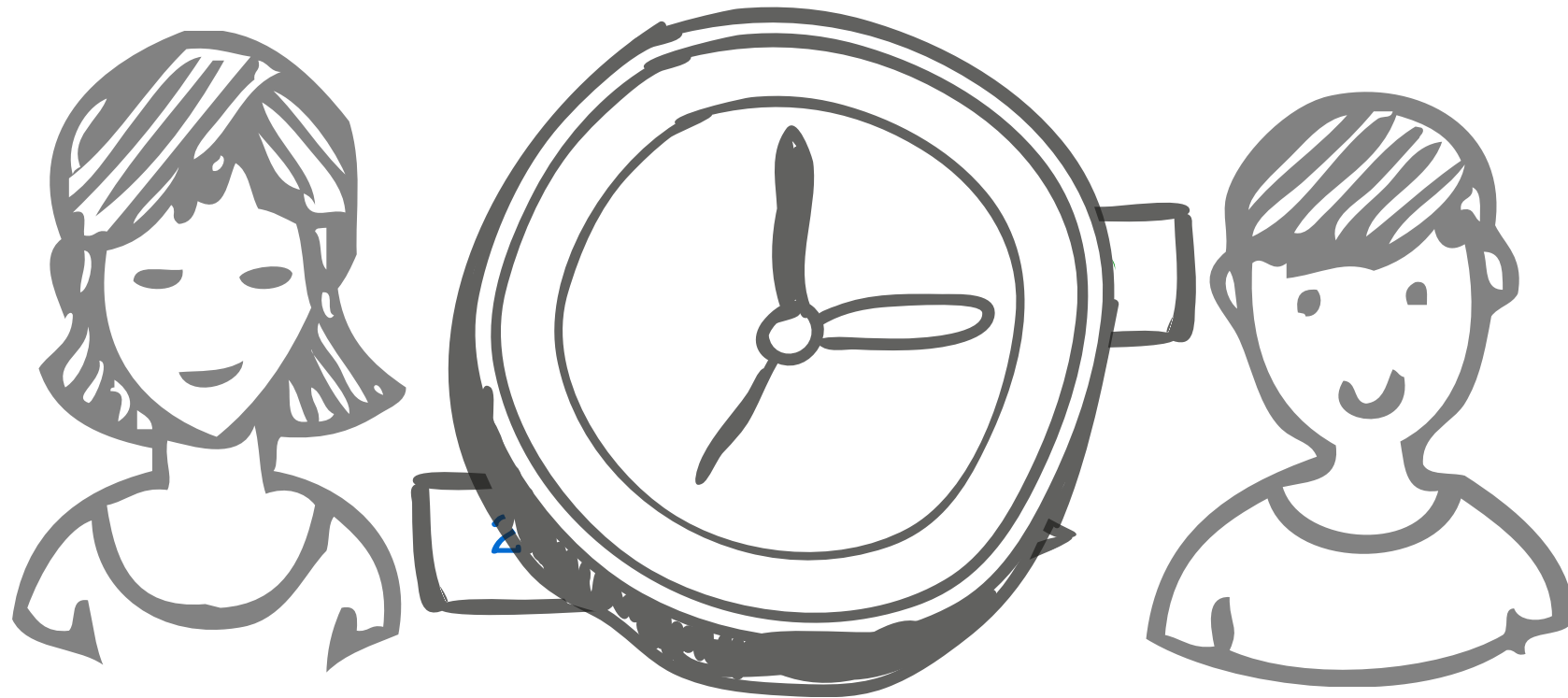
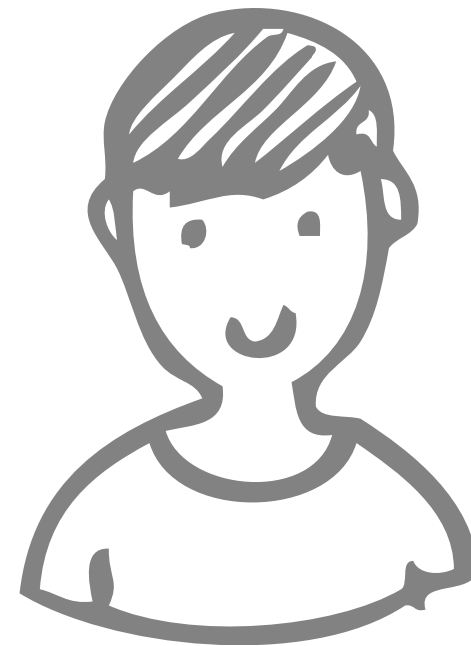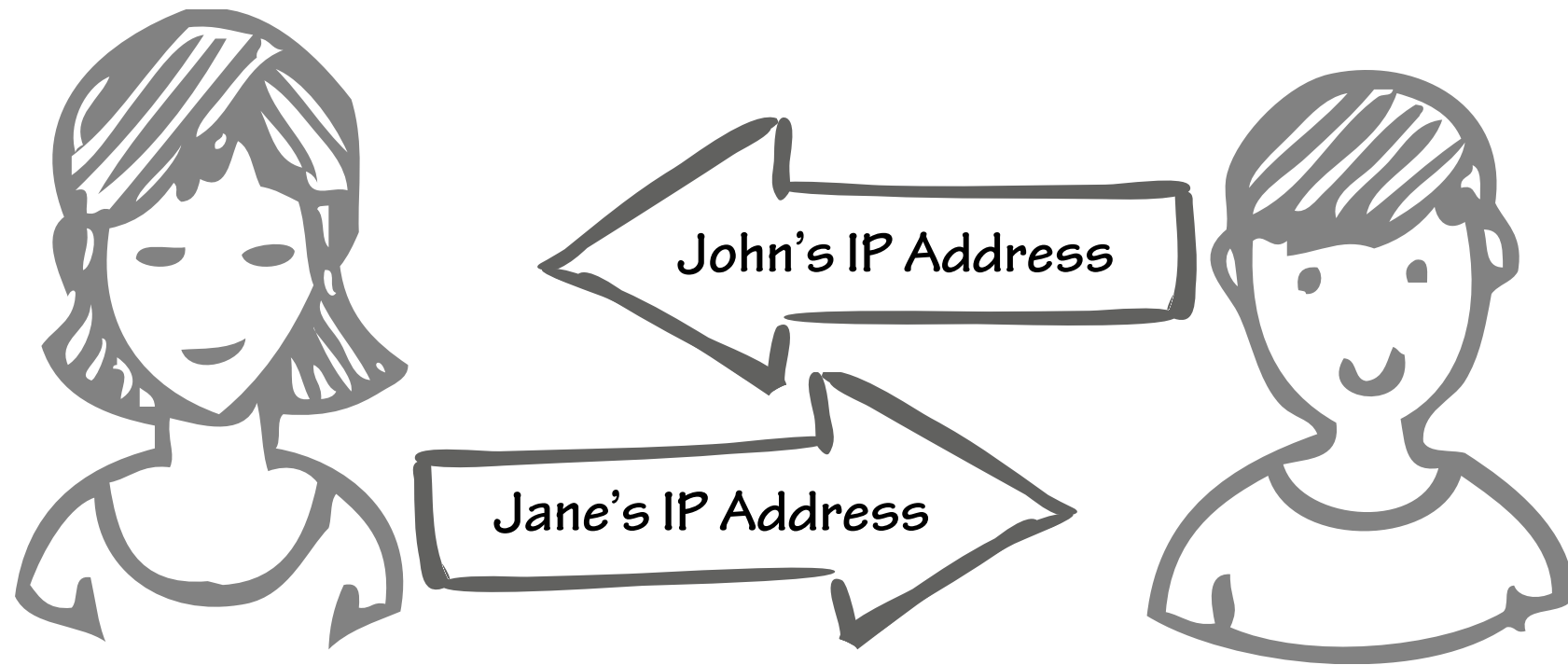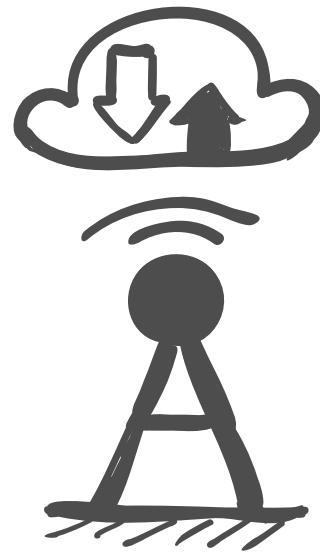|	Local IP	
192.168.0.3		192.168.0.111
225.35.6.2.188	External IP	441.19.4.1.255
123.45.6.7.890	Relay address	987.65.4.3.210

ICE Candidates

But Wait...

Signaling

03-03

How Do We Communicate, to Set Up Communication?

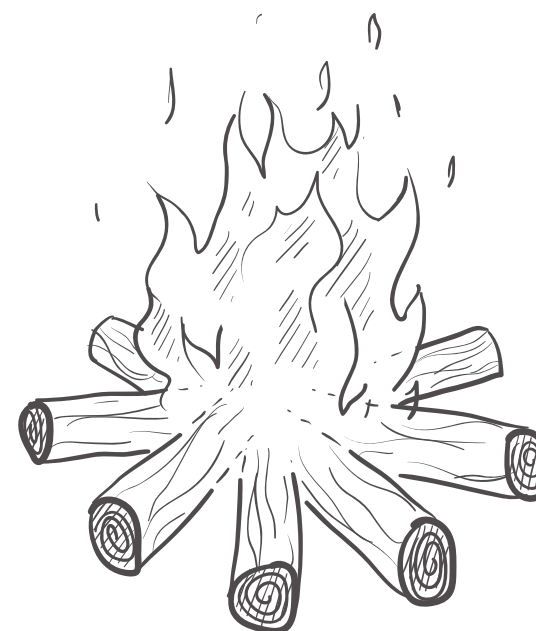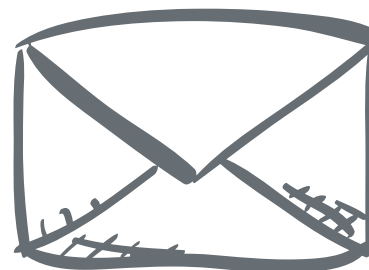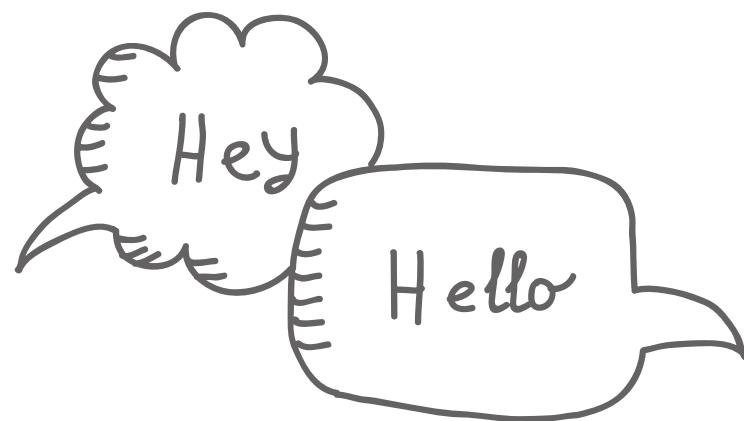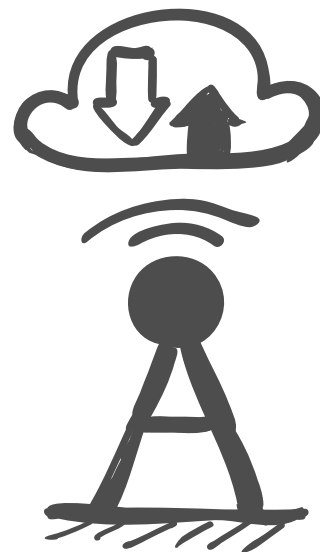# How Do We Communicate, to Set Up Communication?

Hello, Signaling

Hello, Signaling

Hello, Signaling

Signaling Options

- **HTTP POST**
- **Google's Channel API**
- **XHR polling**
- **Server-Sent Events**
- **XMPP (Jabber) over WebSockets**
- **SIP over WebSockets**
- **JavaScript SIP Libraries (JsSIP, SIP-JS, SIPML5...)**
- **WebSockets/JSON**
- **Jingle (used by GoogleTalk)**
- **Signalmaster (open source signaling server)**

For Server-to-Browser

For Server-to-Browser

- socket.io with node.js

For Server-to-Server

For Server-to-Server

- **SIP with WebSockets**

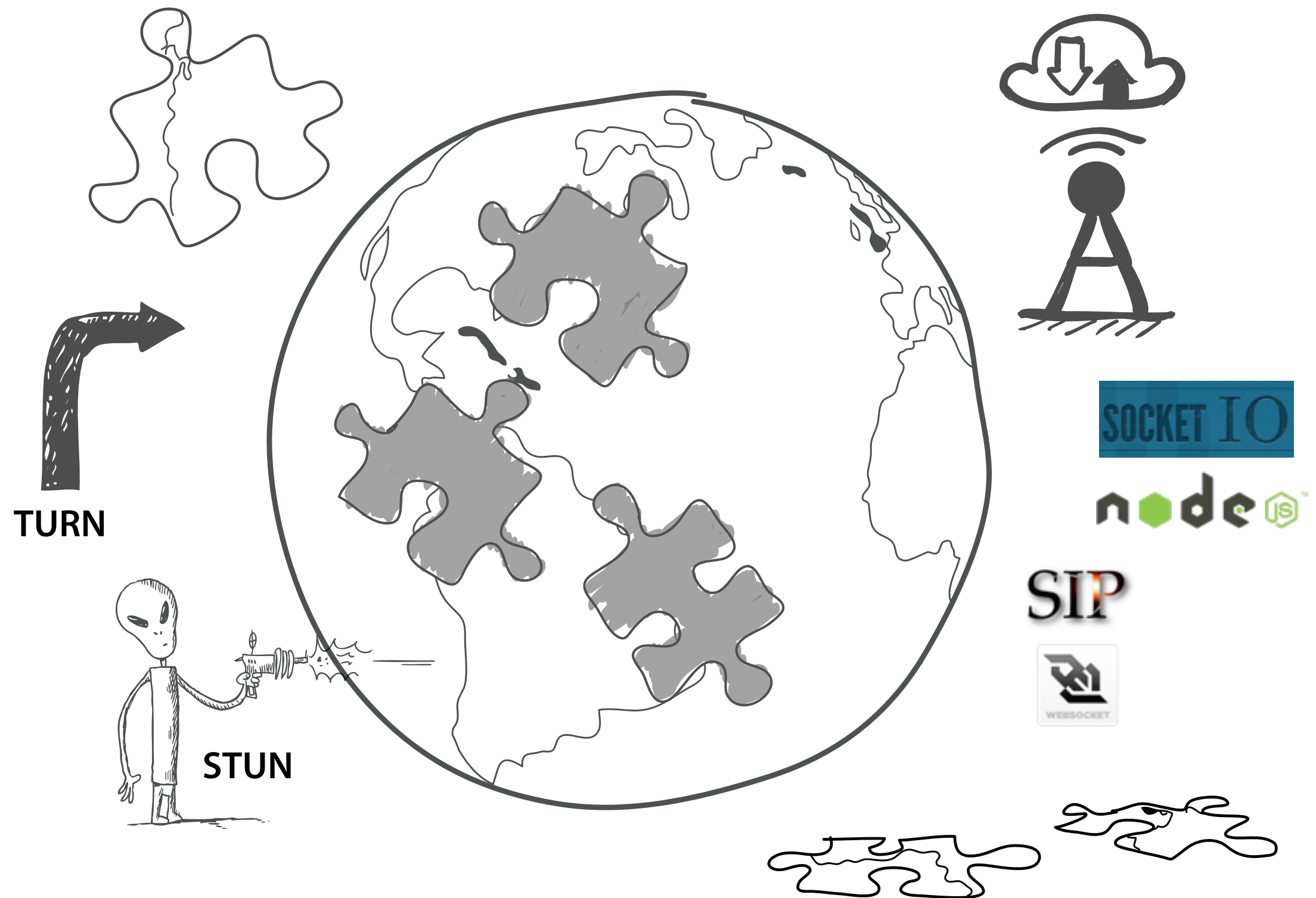# Feel Free to Explore to Find Your Ideal Solution

SIP

WEBSOCKET

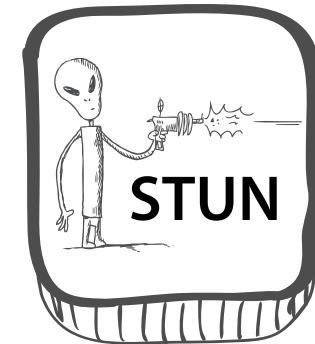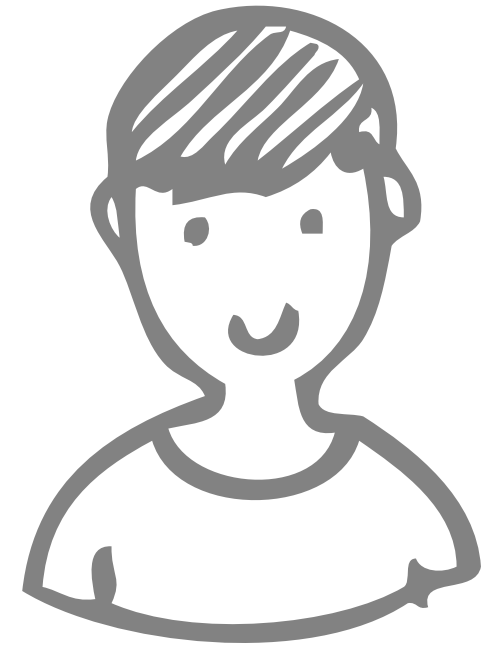# Feel Free to Explore to Find Your Ideal Solution

How Do All of These Pieces Fit Together?

TURN

STUN

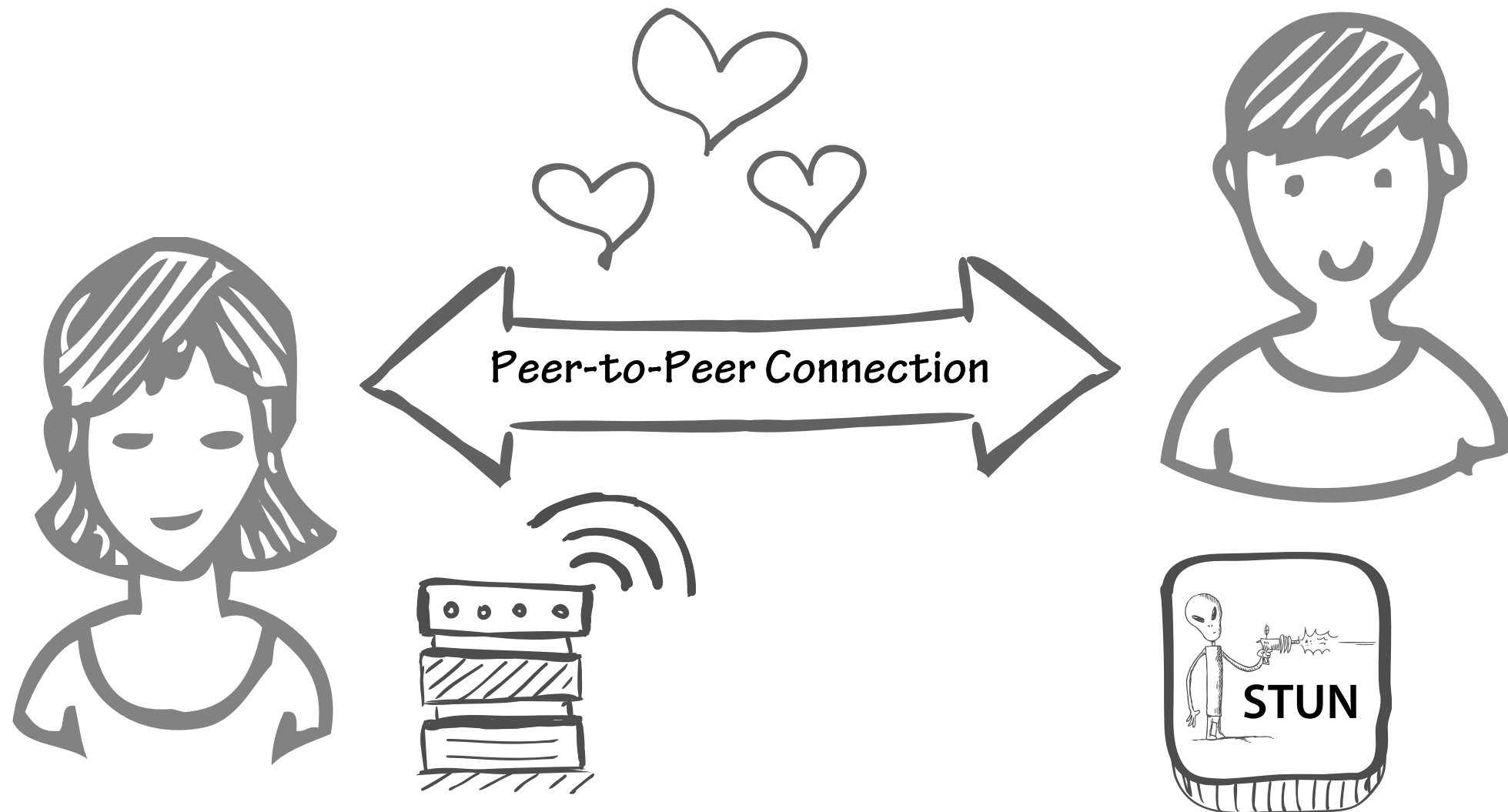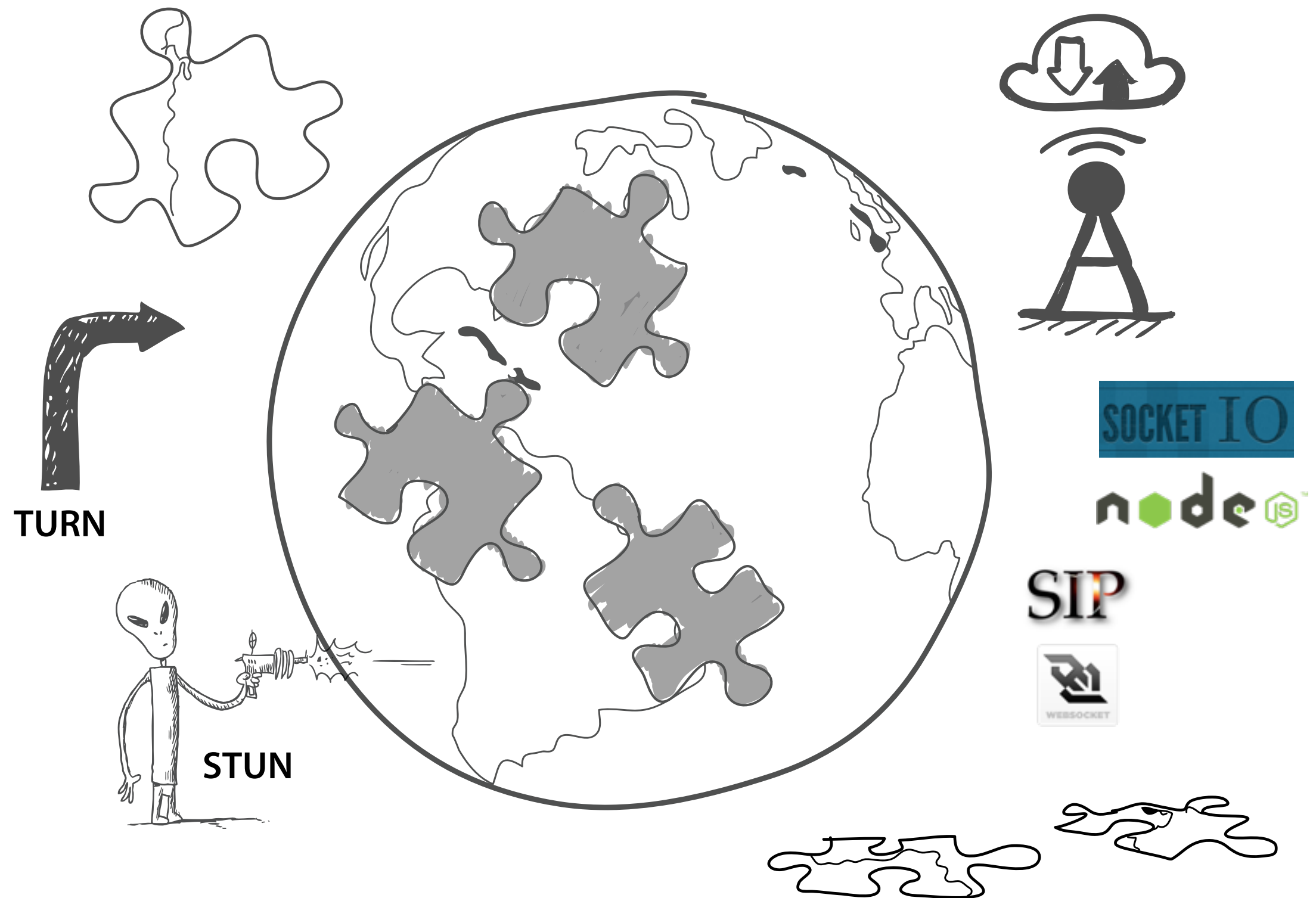SOCKET IO

node js

SIP

WEBSOCKET

03-04

Options for Server Setup/Hosting

Options for Server Setup/Hosting

Peer-to-Peer Connection
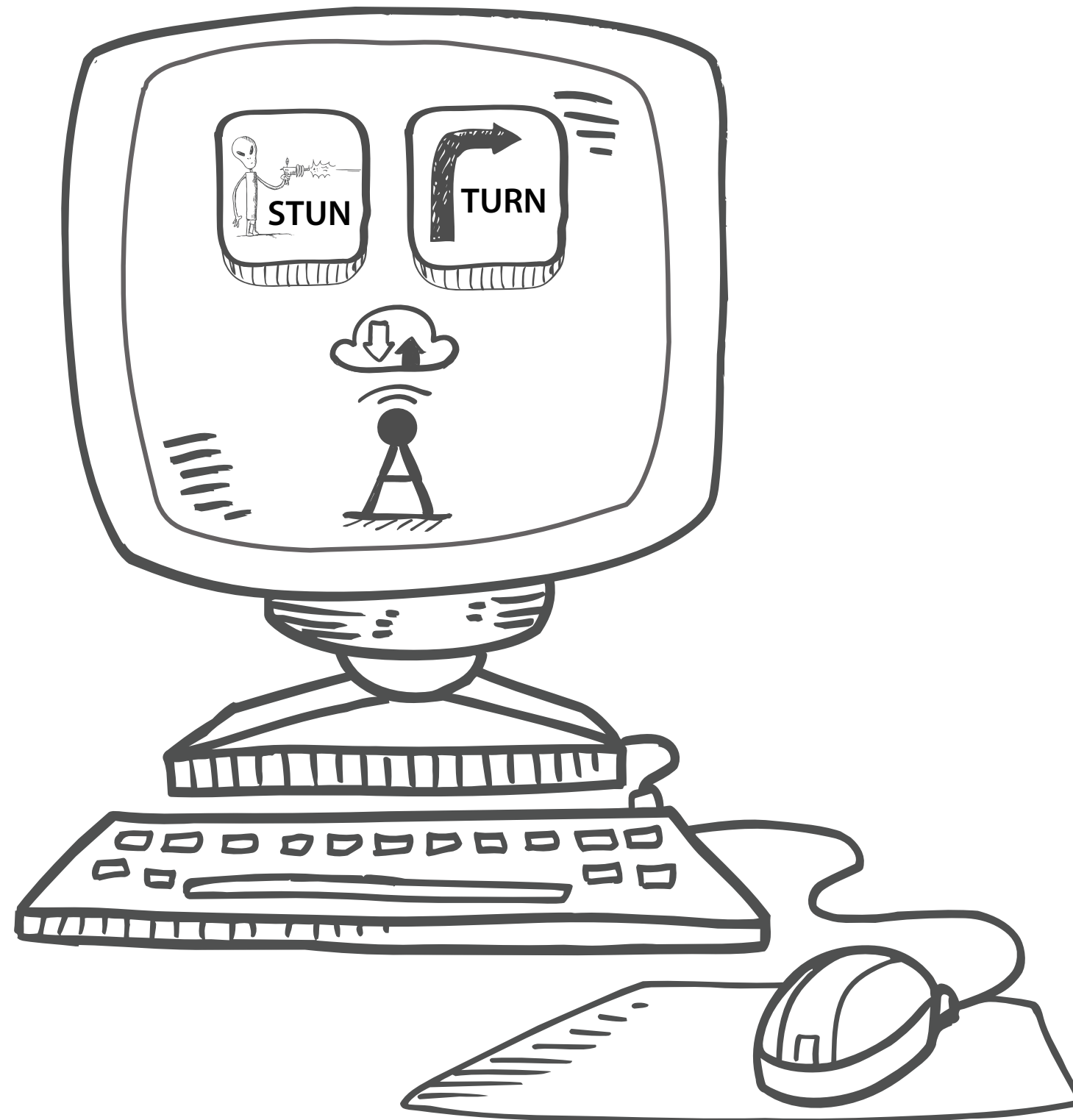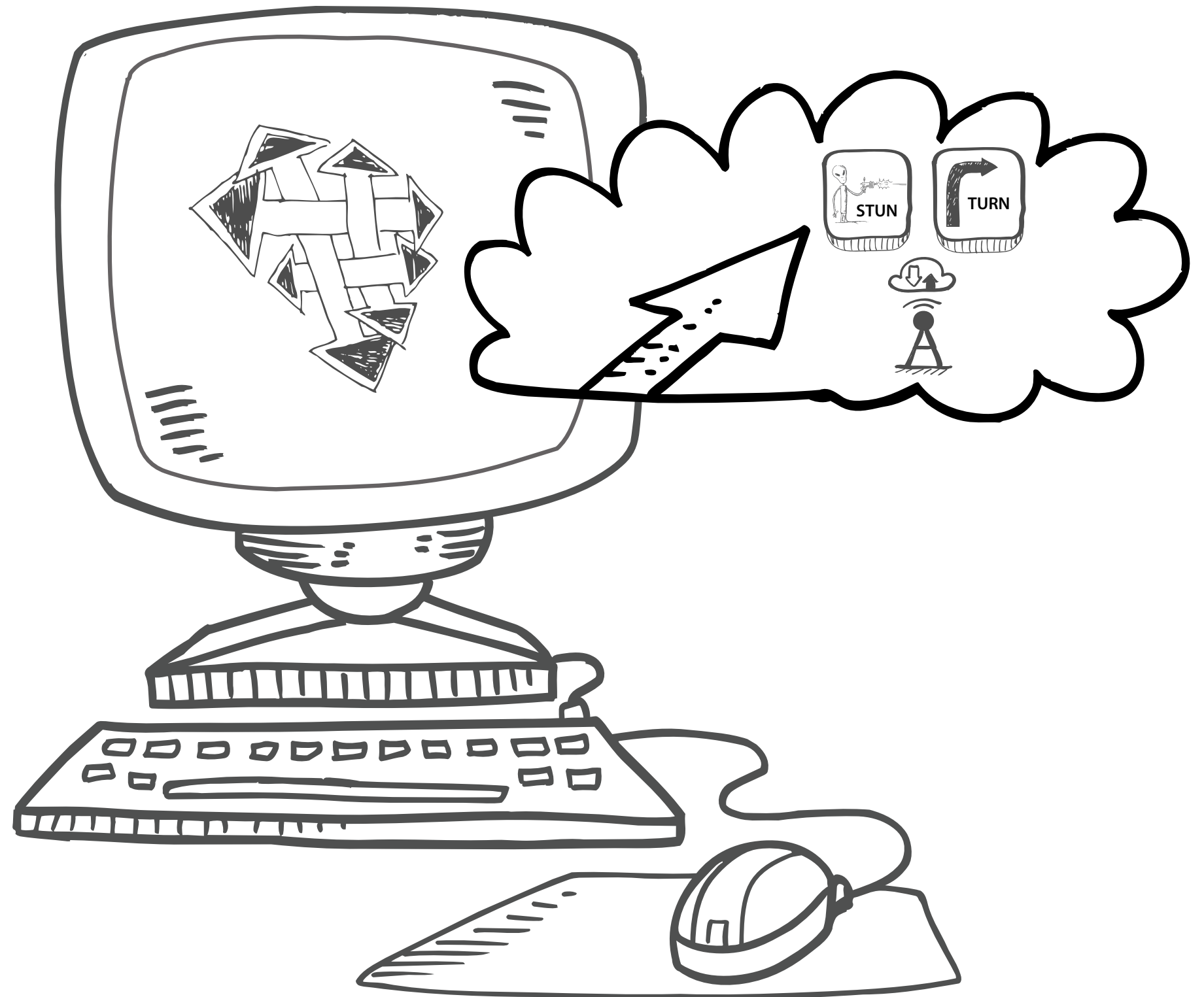
STUN

Options for Server Setup/Hosting

The DIY Approach to Deploying WebRTC Apps

The Service Approach to Deploying WebRTC Apps

The Service Approach to Deploying WebRTC Apps

The Service Approach to Deploying WebRTC Apps

□ **Tokbox.com Open Tok platform**
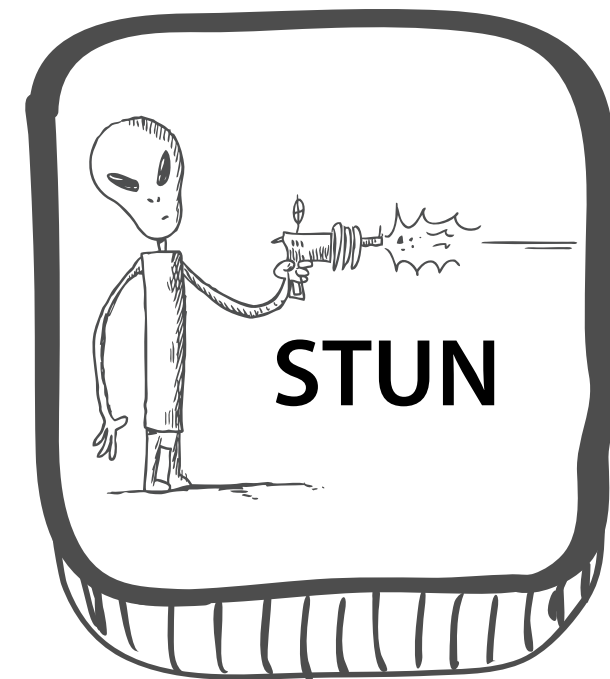
□ **Xirsys.com hosted server infrastructure**

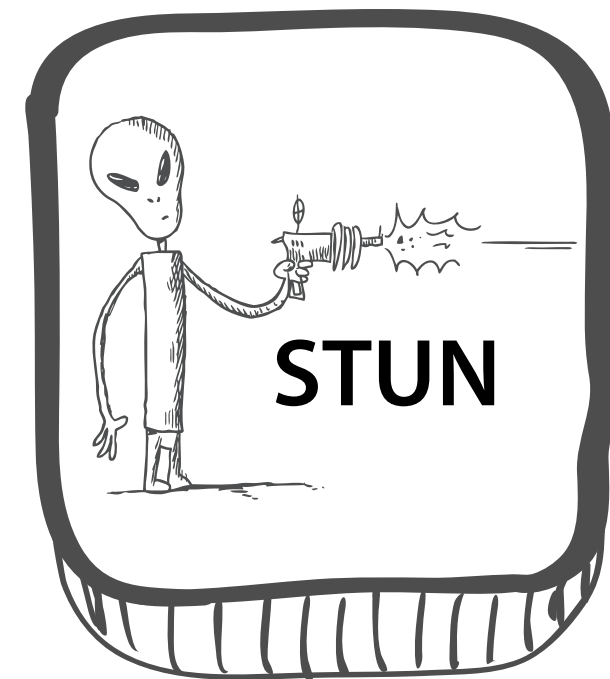□ **OnSIP.com/webrtc hosted PSTN gateway, interop with telecom [BETA]**
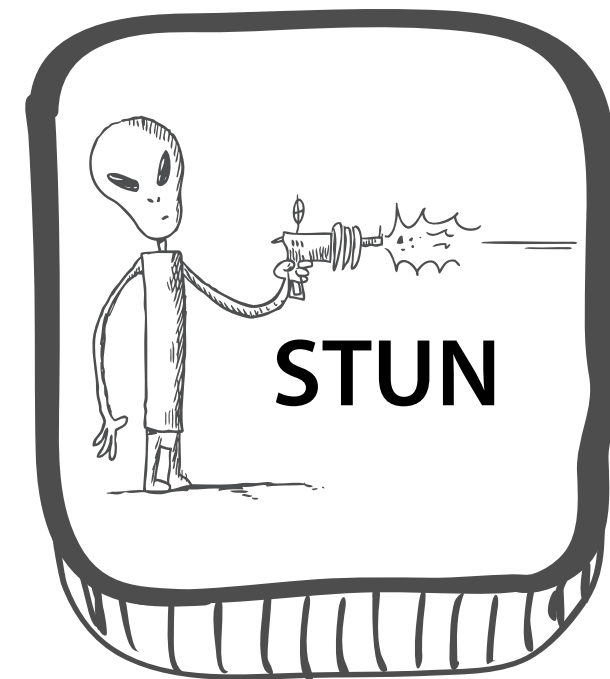
STUN Server Options
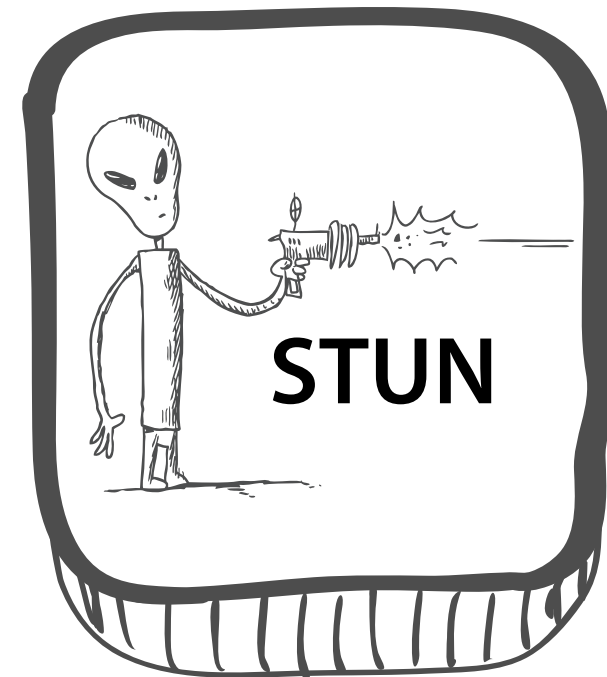
STUN Server Options

□ **Free public STUN server
(https://gist.github.com/yetithefoot/7592580)**

STUN Server Options

□ **Free public STUN server
(https://gist.github.com/yetithefoot/7592580)**

  □ stun.1.google.com:19302

  □ stun1.1.google.com:19302

  □ stun2.1.google.com:19302

  □ …

STUN Server Options

- **Free public STUN server (https://gist.github.com/yetithefoot/7592580)**
  - stun.1.google.com:19302
  - stun1.1.google.com:19302
  - stun2.1.google.com:19302
  - ...
- **Self-hosted on Node.js: https://github.com/enobufs/stun**

STUN Server Options

- **Free public STUN server (https://gist.github.com/yetithefoot/7592580)**
  - stun.1.google.com:19302
  - stun1.1.google.com:19302
  - stun2.1.google.com:19302
  - ...
- **Self-hosted on Node.js: https://github.com/enobufs/stun**
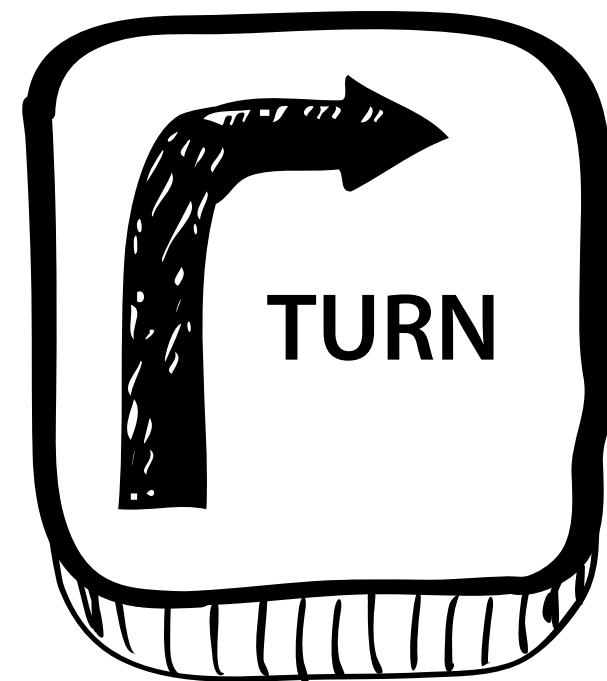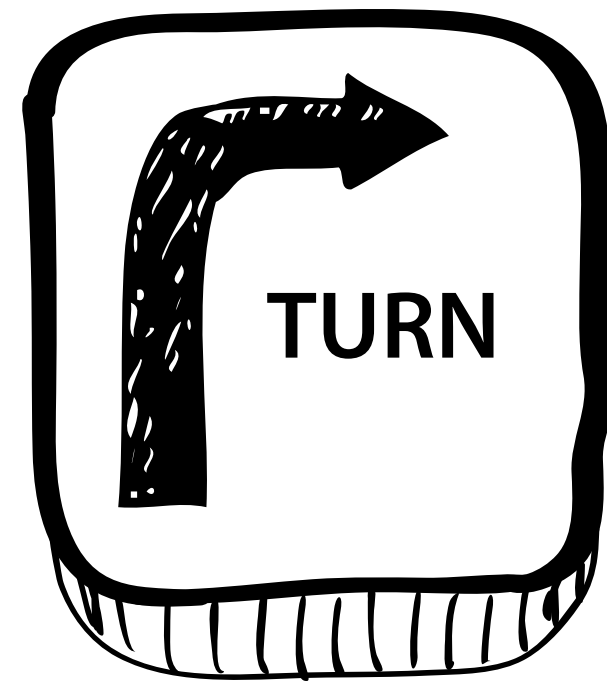- **Or on Linux or Windows: STUNTMAN http://stunprotocol.org/**

STUN
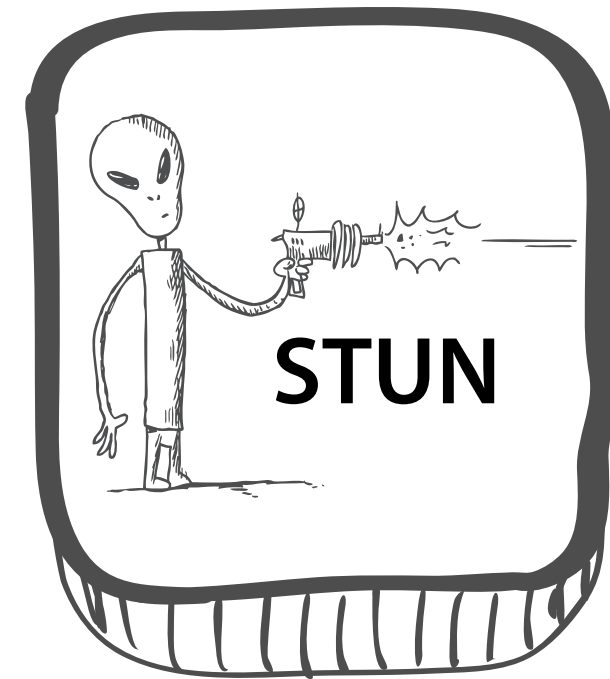
TURN Server Options

TURN Server Options

□ **RFC5766 – on Google Code**

TURN Server Options

- RFC5766 – on Google Code
- NUMB – http://numb.viagenie.ca/
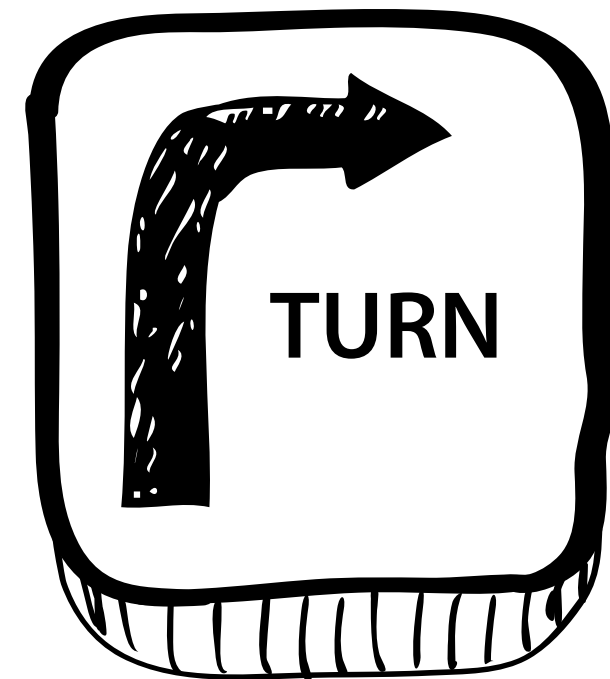
Find the Option That's Best for You