Omgevings condities

* Effen kleding (geen streepjes)
* WC bezocht
* TL buis uit
* Mail afgesloten
* Mobiel stil
* Microfoon aan
* Radio uit
* Vaatwasser uit
* Voldoende ruimte op de SD kaart
* Test of dat er geen 50 Hz brom is.
* Op Raspberry:
  + Audio naar HDMI
  + Audio op hoog volume
  + Desktop icons voor NAS and USB weg
  + Desktop voor ExecMntSyn weg
  + Netwerk aangesloten

Start

* Start the screen recording
* Give a audible sync event for video camera and screen recording.

Script

* Today I will show you how to install scratchClient on Raspberry Pi
* The video will be increased in speed. We will first start the stopwatch so that you can see how long it takes in reality.
* So, let’s start

Open browser  
Search for it  
Open the command line  
Copy/paste the script lines

About the setup

* Today we are using the new Raspberry Pi 3B+ with the Raspian release of 13 March 2018.
* After that, only the desktop image has been set differently for better visibility in the recording, and the stopwatch was installed.

Compatibility

* Sometimes, packages on which scratchClient is depending are updated and then sometimes scratchClient does not function anymore. If that happens, please report the issue, but you can then still download a complete image of the Raspian release as we use it here, with everything installed that I will show in this video.

Introduction and getting material

* Hans, love scratchClient 🡪 videos
* Scratch 🡨🡪 scratchClient 🡨🡪 external hardware
* Weekendschools, programming
* Not only changing pixels 🡪 Also physical computing
* Raspberry Pi, old monitors, mice, keyboards, Arduino
* Build up and tear down of 30 workplaces
* Picture of workplace
* Advantages of scratchClient 🡪 Slides
* Series
  + Getting materials
  + Installation
  + Tutorials for educators
    - UK, DE, NL
  + Reaction time game with model duck on pan/tilt platform
* Thanks Gerhard Hepp
* Video
* Hello, my name is Hans and I will today tell you about a program that I came across and love so much that I started making some videos about it.
* To be able from to access hardware from programs written in Scratch and running on Raspberry Pi or Windows, some software is needed. ScratchClient is a piece of great software that I came around that is the missing link.
* To give some background on what I am using Scratch for:
  + In my free time, I am a volunteer teacher for Weekendschools in the Netherlands. I teach on several Sundays during the year mathematics, physics, making electro breadboards and also programming to motivated children of 11 to 13 years old.
  + Because the schools do not have computers, I took Raspberry Pi s with old 15 inch monitors, keyboards and 2 mice per workplace.
  + The classes are up to 60 children and therefore I have 30 workplaces equipped like that. And of course, during the classes there are many volunteer helpers to help children with their questions.
  + I teach at different locations and those locations do not have permanent classrooms. They use empty classrooms in companies or universities, so everything has to be built up and torn down.
  + I wanted to teach children that programming is not only about changing pixels on a screen, but that it is also possible to control the physical world, so I wanted them to use buttons, LEDs, sensors and servos.
* There are several ways that a connection can be made between Scratch on Raspberry Pi, but there are three things that I like so much about scratchClient:
  + Children can control external hardware using real life names, so BigRedLed rather than GPIO Pin 5 or so.
  + scratchClient can control hardware connected to GPIO pins, but can also deal with components connected to an Arduino Uno or Nano. That appealed much to me because
    - Building up the classroom every week is easier if I can connect an Arduino to the Raspberry than when I have to use GPIO pins.
    - The Arduino is 5 volt tolerant, Raspberry Pi is not.
    - The Arduino has analog input
    - The Arduino has hardware pulsewidth modulation, which makes controlling servos more stable
    - If children do something wrong they may blow up an Arduino clone of 2 euro, rather than a Raspberry Pi of 35 euro
  + scratchClient can also be used to interface with other pieces of software, like Sonic Pi, but even cloud services via MQTT.
* I have created a series of videos so that others can also take advantage of this great piece of software. It is about:
  + Installation of the software
  + Getting the materials
  + A series of tutorials for primarily educators who want to set up something themselves. The videos are in Englisch, but the tutorials are available in English, German and Dutch.
  + A game that children program in the Weekendschools.
* Although scratchClient can interface with the GPIO pins of Raspbery Pi, I focus in these videos on using Arduino as a versatile interface board.
* I close with a small piece of the reaction time game that children program. The red LED will be lite up at random times. Children must press a button as fast as possible after the red LED lites up. The first one will see the duck turn to him or her and make a bow. When pressing the button when the LED is not lit will be indicated by the duck turning to the one who pressed wrongly and then shake “no”.
* If you are interested, take a look at the next videos. If you have questions let me know.

Acquiring the materials

* See previous video for context
* Materials for physical computing with an Arduino
* Use scratchClient to control from Scratch
* Local electronics store or webshop
* Aliexpress.com
  + Very cheap.
  + Often no shipping costs, especially on LOW quantities
  + < 22 euro
  + Long delivery times
* Prices vary greatly, but May 2018 price level indications
* Needed for the beginner and intermediate level tutorials
  + Arduino Nano (can use Uno instead). 2 to 2.5 euro
    - 328p
  + Nano board 1 euro
  + Cable with micro or mini USB 75 eurocent
  + HC-5
  + Breadboard with 400 holes 1 euro
  + Buttons 6\*6\*5 3 cent to 1 cent
  + LED 10 mm 8 cent, 3mm
  + Resistors 1 cent
    - 180 ohm up to 320 or so, 1 kohm
    - ¼ W
    - ½ W
    - 1/8 W not recommended (thin wires)
  + Dupont cables 10cm
  + Potentiometer 10k 20 cent
  + Servos SG90
  + Buzzer module
  + 9 volt power – don’t trust the rating of current
* Order < 22 euro
* Next videos
  + Installation
  + Tutorials
  + Materials for the advanced and expert level

Installation

* Hans
* Install scratchClient
* Timer
* Github, search for scratchclient-tutorials
* Install package or take complete image
* Sort icons