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**GUIDE TO USING RACHEL**

FOR USERS AND EDUCATORS

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OVERVIEW OF RACHEL

RACHEL CONFIGURATIONS

INSTALLING RACHEL

AN EDUCATOR’S GUIDE

Currently ⅔ of the world is unable to access the internet[[1]](#footnote-0). That means that ⅔ of the world has no means of accessing what is possibly the most empowering educational vehicle of our time.

That’s where World Possible comes in. We are on a mission to make a world-class, yet worldly education possible for anyone, anywhere, especially where there is no internet or sufficient bandwidth.

We offer a burgeoning collection of content curated from the best the internet has to offer, and we provide the solutions for getting these resources to learners across the world.

This guide is meant to introduce RACHEL, our prepared solution that makes this all possible. We will cover RACHEL’s contents, how to install and setup a RACHEL configuration best suited for your situation, and share insights on how to best utilize RACHEL.

**INTRODUCING RACHEL**

BRINGING ONLINE LEARNING TO THE OFFLINE WORLD

**WHAT IS RACHEL**

**RACHEL**, short for **R**emote **A**reas **C**ommunity **H**otspots for **E**ducation and **L**earning, is World Possible’s continually expanding initiative to provide a free education to individuals in parts of the world with limited or no internet access.

**WHY IS RACHEL NEEDED**

World Possible recognizes that areas without internet tend to be in Emerging countries. These include areas where

* There is Internet connectivity, but the available bandwidth is unusable for most practical purposes, much less to watch videos or rich media lectures or textbooks.
* And/Or Internet connectivity is too expensive.
* And/Or a school or community has good Internet connectivity but access to many web sites is blocked, like YouTube, where video lectures of multiple colleges and organizations are hosted.

RACHEL has been configured using the most cost-effective devices to provide a very affordable, very compact, low-power server platform to bridge the Internet divide. It is very convenient to transport, ship, setup and maintain on on-the-ground deployments.

CONTENTS

RACHEL comprises a vast wealth of resources provided in partnership with the internet’s most prominent content providers. Each standard RACHEL configuration comes packaged with

* An offline Encyclopaedia from **Wikipedia**
* Thousands of Khan Academy video lectures on Math and Science from **khanacademy.org** .
* More than 3,000 organized eBooks from **Project Gutenberg**.
* MedlinePlus, a full medical encyclopaedia from the **U.S. National Library of Medicine** and **the National Institutes of Health**.
* The latest Medical publications and Health Guides from **Hesperian**.
* The OLPC Collections from the **OLPC (One Laptop Per Child) Project**.
* Teachers resources from the **UNESCO International Institute for Capacity Building in Africa**
* Practical solutions to common problems in developing communities from **practicalation.org**
* Among many other content offerings. For a comprehensive view of all that RACHEL offers, we have a live sample hosted on our website at rachel.worldpossible.org

SPECIAL FEATURES

I. ADD/REMOVE YOUR OWN CONTENT

RACHEL’s content offerings might not be fully complete for your learning community. Our content offerings reflect our developers’ judgments on what we believe to be indispensable educational resources for any community. However the resources we included may not fully meet the unique educational appetites of your community of learners. Thus, we implemented a platform to add your own content to ensure your RACHEL package will better reflect the needs of your targeted community. [Instructions here]

II. BUILD RACHEL.DIY

Not sure what to include (or what not to include) in your RACHEL package? Browse our content database for a full selection of special content beyond our standard offering. Pick and choose by modules to create your own RACHEL package. [Step-by-step instructions here]

III. TRACK STUDENT PERFORMANCE

View student reports monitoring student progress and proficiency in all of Khan Academy’s interactive exercises. [run-through of features/how to use]

**RACHEL CONFIGURATIONS**

MULTIPLE SCENARIOS, MULTIPLE SOLUTIONS

Given the variability of conditions and available resources in remote regions, World Possible has designed multiple RACHEL configurations to accommodate multiple scenarios.

Layout Scenarios on one side and Solutions on the other. [\*note, OS configurations and compatibility are not noted]

Rasperry Pi - The quintessential “Plug and Play” RACHEL set-up that combines all the core functions needed to set up a RACHEL server in a simple credit-card sized Linux Box. Pair this device with a memory card, a wireless dongle, and a power source, and you have a veritable wireless hotspot to provide access to RACHEL for numerous wi-fi enabled devices. Also provides the most cost-effective computing power to run a RACHEL server.

RACHEL USB/SD - good to plug into any individual device and can be used to download RACHEL content to laptops and tablets individually. Cheapest method of delivering RACHEL to devices without internet access. Cons: Access limited to one device at a time/long download times.

NAS - More integrated router system with storage included. Has more storage capacity and can accomodate larger hard drives--albeit much more than the 64GB required for RACHEL.

WW DRT - Requires a dedicated router system, operating system, and storage. Low-end configuration that can be scrapped together using easily found second-hand parts. Cons: Only supports a handful of users per deployment, and the ‘build from scratch’ model equates to a more challenging set-up process.

BRCK - Ruggedized router and modem designed to accommodate for power issues in developing regions and spotty internet connectivity. Essentially takes the position of an internet backup that funnels internet connectivity reliably in unreliable settings. If you’re looking to ensure the most reliability in RACHEL configuration with a higher sticker price, with the addition of a few other devices to complement BRCK, this could be it. Goes beyond the functions of an ideal RACHEL device, and represents a high-end configuration of RACHEL.

CONTENT

\*solicit content chart from John Walker

**INSTALLING RACHEL**

FOR RACHEL USB AND RACHEL PI

*RACHEL USB*

Two methods are provided for downloading RACHEL onto a USB drive. The first is to torrent RACHEL using BitTorrentSync, a secure torrenting platform that requires a code to ensure authorized downloads. Due to RACHEL’s relatively large size, this download may take over a day to complete, so please consider the reliability and speed of your internet connection before choosing to torrent RACHEL.

Alternatively, you can opt to download RACHEL in a single, compressed file through our file transfer protocol (FTP) server. This will require a few extra steps, but cuts the download time and bandwidth needed to a fraction of that of torrenting RACHEL.

*For the first option you will need:*

* 32GB or 64GB USB Flash Drive
* To download BitTorrent Sync
* BitTorrent Sync Code (Provided below)

*For the second you will need:*

* 32GB or 64GB USB Flash Drive
* To download Filezilla
* winmd5 (optional for verification purposes)
* Unzipping software such as WinZip or 7-Zip

*DOWNLOADING RACHEL USB via BitTorrent Sync*

1. Install BitTorrent Sync Beta from <http://www.bittorrent.com/sync>
2. In BitTorrent Sync, click 'Add Folder' button.
3. In 'Folder secret' field, enter the BitTorrent Sync you kept handy from before.
4. 'Choose' a new folder to keep your shared files and click 'OK'.
5. Wait for the download to complete on your device.

*DOWNLOADING RACHEL USB in compressed format via FileZilla*

A very good and free FTP client for Windows, Mac and Linux is FileZilla. We recommend it because it has very important features for downloading very large files like RACHEL. (NOTE: *We do not support FTP downloads for all versions*.)

1. To begin, download FileZilla from [**filezilla-project.org**](http://filezilla-project.org/)
2. Start FileZilla and at the top tab where it says ‘Host:’, ‘Username:’, ‘Password’, and ‘Port’, input the following credentials
   * **FTP connection**: Host = **ftp.worldpossible.org** , Username = **anonymous@worldpossible.org**,Password = **anonymous**, port = 21 (default).
3. Once connected you'll see the files in the server available for FTP download. Go to the "rachel" folder and drag the **rachel\_wamp\_20131007.zip** file to a folder in your computer. The FTP download will automatically start.\*
4. After downloading the large package file to your computer you have to unpack it, with a tool like 7-Zip or WinZip, which will be already included on Windows. You can download 7-Zip at [www.7-zip.org](http://www.7-zip.org).
5. Open your unzipping software and ‘Extract’ the **rachel\_wamp\_20131007.zip** file to the 32 GB USB drive plugged to the computer, though you may prefer to save to the computer hard drive to have as "master", and then make multiple copies from it to USB memory sticks as needed.
6. Wait for the extraction of the zip file to complete.

*RACHEL Pi*

What you’ll need:

* Raspberry Pi Model B (512MB) - [**Amazon**](http://www.amazon.com/gp/product/B009SQQF9C/ref=as_li_qf_sp_asin_tl?ie=UTF8&camp=1789&creative=9325&creativeASIN=B009SQQF9C&linkCode=as2&tag=worlposs-20) - $41.00
* Clear Plastic Case (to house and protect the Pi) - [**Amazon**](http://www.amazon.com/gp/product/B00DK7XRAA/ref=as_li_tf_tl?ie=UTF8&camp=1789&creative=9325&creativeASIN=B00DK7XRAA&linkCode=as2&tag=worlposs-20) - $9.50
* 5V at least 700mA DC Power Adapter (Pi is sensitive to charging specifications) w/ Cable - [**Amazon**](http://www.amazon.com/gp/product/B005LFXBJG/ref=as_li_tf_tl?ie=UTF8&camp=1789&creative=9325&creativeASIN=B005LFXBJG&linkCode=as2&tag=worlposs-20) - $5.50
* Cat 5 Cable (to connect to router) - [**Amazon**](http://www.amazon.com/gp/product/B000067REO/ref=as_li_tf_tl?ie=UTF8&camp=1789&creative=9325&creativeASIN=B000067REO&linkCode=as2&tag=worlposs-20) - $3.50 -**or-** Ralink Wifi Dongle (to create wifi network) - [**Amazon**](http://www.amazon.com/gp/product/B007BWFXYS/ref=as_li_tf_tl?ie=UTF8&camp=1789&creative=9325&creativeASIN=B007BWFXYS&linkCode=as2&tag=worlposs-20) - $7.40
* A 32GB SD flash memory card - ~$25.00
* Power Source or an independent Power Supply
* Win32DiskImager, a free Windows software, from [http://sourceforge.net/projects/win32diskimager/files/latest/download](http://www.google.com/url?q=http%3A%2F%2Fsourceforge.net%2Fprojects%2Fwin32diskimager%2Ffiles%2Flatest%2Fdownload&sa=D&sntz=1&usg=AFQjCNGIaRA_VWWVKEuS7JLm83vrSzlL1A)

1. Download the RACHEL-Pi image, or copy-clone, through BitTorrent Sync.
   1. Install BitTorrent Sync Beta from <http://www.bittorrent.com/sync>
   2. In BitTorrent Sync, click 'Add Folder' button.
   3. In 'Folder secret' field, enter the BitTorrent Sync code you kept handy from before.
   4. 'Choose' a new folder to keep your shared files and click 'OK'.
   5. Wait for the download to complete on your device.
2. Write the downloaded RACHEL-Pi image to your SD memory card.
   1. Plug your SD card into your PC.
   2. Start the Win32DIskImager software (Win32DiskImager.exe)
   3. Select the downloaded rachel\_pi\_32\_20130924.img file and the drive where the SD card is inserted. Then click the "Write" button.

You have a card with the OS and the pre-configured RACHEL-Pi content package ready for action!

1. Setting up your RACHEL Pi Server or Wireless Hotspot
   1. Setting up the Server using a Wireless Router
      1. Insert your SD card into the Raspberry Pi SD card slot
      2. Use the CAT5 cable to connect the raspberry pi to the router
      3. Plug in the power to the Raspberry Pi
      4. Find out the IP address of the Raspberry Pi by using another computer or wireless-enabled device connected to the same network, matching the IP address associated with the “Vendor: Raspberry Pi Foundation”.
      5. Save the IP Address to connect additional devices to your new RACHEL server

You’re all set to start using RACHEL!

1. Setting up a Wireless Hotspot
   1. Plug your USB WiFi Adapter to one of RACHEL’s USB ports
   2. Power up the Raspberry Pi
   3. From a Wi-Fi computer or mobile device connect to the “**RPI**” Wi-Fi network
   4. From the computer or device you are using to access RACHEL, enter the **192.168.10.1** address to the URL window on your internet browser

**RACHEL REPOSITORY FOR EDUCATORS**

SELF-ORGANIZED LEARNING ENVIRONMENTS AND PROJECT-BASED LEARNING

SOLE = Self-Organized Learning Environment

SOLEs invite children to become exceptional at asking big questions that lead to intellectual journeys that pursue big answers that go beyond rote memorization. The model operates on the innate sense of wonder that exists in every child to engage them in curiosity-driven learning. Educators will play an important role in both teaching kids how to think, and providing the room and tools for them to feed their curiosity. RACHEL is a great collective resource for powering SOLEs, allowing incredible breadth to satisfy the boundless range of childrens’ questions, and the depth to formulate big answers.

*To Learn More:*

Check out the SOLEToolkit at <http://www.ted.com/pages/sole_toolkit>

PROJECT BASED LEARNING: LEARNING BY DOING

Project Based Learning (PBL) is a teaching method in which students gain not only knowledge, but also important skills, by working for extended periods of time investigating and responding to a complex question, problem, or challenge. PBL is founded on the premise that the presentation of an open-ended question that students understand and find intriguing naturally triggers in-depth inquiry as students will see the need to gain knowledge, understand concepts, and apply skills in order to answer the proposed problem. With the guidance of an educator, students are given the freedom to decide how they would like to approach the challenge to promote critical thinking and creativity. Group work also naturally leads to improved collaboration and communication skills among students. PBL has been touted to promote a greater depth of understanding of concepts, a broader knowledge base, enhanced leadership, investigation, and writing skills.

*To Find Ideas for Projects or to Learn More:*

Visit <http://www.edutopia.org/project-based-learning> and <http://bie.org/>

\*If you have stories or other practices that you’ve used with RACHEL in your classroom, please share them with us at info@worldpossible.org!

1. According to Internet World Stats as of June 30, 2012. [↑](#footnote-ref-0)