# Introduction, disclaimer

This manual assumes you have a considerable familiarity with Debian, and/or it's derivatives. As of writing, the Adversity Response Kit (known hereon as the ARK System) is best built upon one of the following four distributions:

Debian

Devuan

Kali Linux

ParrotOS

NOTE: It is HIGHLY recommended that ARK System builders use a release on-par with Debian Bullseye (Debian 11) or later.

Ideally, users will want to use Debian or Devuan, as their architecture support is the broadest, but Kali and Parrot can provide acceptable levels of functionality as well. The reason being, is that the ARK System is designed to be ableto develop for, tinker with, and distribute packages for machines of other architectures besides the host's own Architecture.

This kit is installable on the following Architectures (Though support by the individual distributions will vary):

amd64

arm64

i386

armhf

mipsel

mips64el

With this out of the way. . .

**What you will need**

1. some form of installation media for your chosen distribution, or other alternative means of installation. This manual assumes an ISO was used. It is highly advised to go with images that include the non-free firmware. This is because in this situation, functionality of hardware is an absolute must. This is a dire situation already, do not worsen it by letting free software ideology prevent the proper funciton of critical machinery, there will be plenty of time to write free replacements AFTER you (re)build.
2. Internet Connection, OR an offline copy of the repository of the chosen host architecture.

3. At minimum, 500GB of Storage Space available to your machine. It does not necessarily have to be all one drive, Logical Volumes meeting this requirement are acceptable, but let it be known, this carries risk with it.
4. A local copy of this repository.

Warning: Do NOT make separate paritions for any directory, no matter how tempting. All files must be on the primary partition.

### Step 1: Initial OS Installation

As installation methods may vary widely, depending on what the user has access to, there is no one-size-fits-all approach. But, regardless of method, the follwing requirements must be met:

1. All base system files MUST be on one partition and drive. NO separate /usr, /home, or /etc partitions or drives. The sole exception is in the case of logical volume management, if multiple drives comprise a single logical volume partition in order to meet the storage requirements. We recommend, however, starting on ONE of the drives, and adding the others later on, that way of one drive fails, it doesnt take the whole system with it.
2. You MUST install a FULL Desktop Environemt that is reasonably usable to the common person (NOT a Window Manager, not even IceWM or JWM). Gnome, XFCE, or any other Desktop option seen in the distribution installer or in tasksel will suffice. Use "sudo tasksel" to get to this if the system has already been installed. Furthermore, you may also install the "phosh-tablet" metapackage, which can be used in the even your chosen device only has a touch screen for interface. It will allow you to use it like a tablet. note, however, that you will still need a keyboard for initial setup.

3. Must be a CLEAN installation, this cannot and SHOULD NOT be atop an existing one!
4. Make sure you have at least ONE working text editor

Note: It is advisible to do an "apt update" and ensure you are able to reach the core repository of whichever of the forememtioned Debian Systems you have chosen, or are able to use the offline mirror. **Also make sure this is the FIRST entry on your sources.list. It will be imperative in Chapter 2**

### Step 2: Setting up the base system

If you have made it this far, good. Now, if you have not already, transfer your copy of this repository onto the target machine, by whatever means necessary, and then return to this manual. Then reopen to this chapter with whatever software you have to.

Got it? Good.

By now you have noticed the "SCRIPTS" folder, please "cd" into it via the terminal now.

First, execute the pre-dependencies installer, like so:

sudo chmod +x install-predeps.sh

sudo ./install-predeps.sh

assuming you took the time to ensure your sources list was working as I had advised, this should install everything you need.

Note: yes, your /usr is now merged. Cast ideology aside, because the fact is, you will not be able to update your base system (or later, your stratums) to future versions without doing so. Too many packages depend on it now. This is why I told you not to put it on a separate partition or drive.

Now, for the fun(?) part:

cd into the HIJACK folder ("cd HIJACK")

list all of the scripts with the "ls" command. just "ls" is sufficient.

Do you see all of those scripts? You only need ONE.

Note: x86_64 is also known as amd64

Determine which script belongs to your architecture, and run it like so:

sudo chmod +x (your chosen script here)

sudo ./(your chosen script here) --hijack core

follow every prompt, and then reboot.

Note: The inclusion of "core" will label your base system, known hereon as your Master Stratum, to where it is clearly distinguishable from the other stratums.

On boot, you should see a list of init systems, one of them should be labelled "core". Select this one, and boot.

# CONGRATULATIONS! If you made it this far, you have successfully completed chapter 1

# Chapter 2: Local Apt Archive, and Apt-Tar

**Introduction**

One of the greatest strengths of the ARK System is it's local package repository. This allow's the System's Administrator to access the software needed to adjust it to their needs, even if there is no internet available. However, in order to be able to aid in infrastructure maintenance, the system must be able to serve packages to other machines in some way, shape, or form. This is what the

Apt-Tar tool is for. This chapter will show you how to set up your local package repository, and how to install and utilize the Apt-Tar tool.

## Step 1: Setting up your Local Mirror

Note: It is also HIGHLY advised that you have offline copies of the installation media for each architecture you intend to mirror. Server ISO's at the very minimum!

If you already have a local copy of your distribution's mirror, copy it to your machine now. If not, or even if you do, still follow along.

**Warning: This will take a LOT of bandwidth. If you have more advance time to prepare, perhaps consider merely mirroring certain portions at a time, and adding to it over time, if such would make it easier to eventually get the full mirror.**

cd back into the SCRIPTS directory, and run "ls". You will notice a script called "build-apt-archive.sh". Take note of it, but do not run it yet. Instead, run the folowing command:

sudo nano /etc/apt/mirror.list

This will take you to the apt-mirror configuration file. You will see a long list of mirrors. For the purposes of this manual, we will use Devuan as an example, but the same applies to the other suitable distributions as well. By the time you have adjusted your mirrors list, it should look similar to this:

deb-src http://pkgmaster.devuan.org/merged daedalus main contrib non-free non-free-firmware

deb http://pkgmaster.devuan.org/merged daedalus main contrib non-free non-free-firmware

deb-i386 http://pkgmaster.devuan.org/merged daedalus main contrib non-free non-free-firmware

deb-all http://pkgmaster.devuan.org/merged daedalus main contrib non-free non-free-firmware

deb-arm64 https://pkgmaster.devuan.org/merged daedalus main contrib non-free non-free-firmware

Note: From Debian 12 Onward, or Devuan Daedalus (5) Onward, non-free will be split into non-free and non-free-firmware. Mirror both non-free and non-free-firmware, to be safe. Also be aware that deb-all is critically important, as a lack of indexes for it can be problematic in some situations. "deb" stand-alone is for your host architecture. "deb-$ARCH" is for other other architectures you mirror.

Next, at the top of the page, you will see " # set base_path /var/spool/mirror" or similar. change this to "set base_path /ark/mirror" without the "#" mark.

You will also notice a commented-out line at the bottom that says "clean (URL HERE)". uncomment it, and change the url to the base URL of your mirror. This will allow outdated packages to be purged from your mirror during maintenance, and save precious disk space.

We recommend you mirror at LEAST the following architectures:

amd64

i386

arm64

and, the deb-src repository, so that the source code is available as well.

Once you have done so, save your configuration in nano, and then run the following command:

sudo chmod +x build-apt-archive.sh sudo ./build-apt-archive.sh

Once your mirror is complete, open your /etc/apt/sources.list file, and replace your original source with your local mirror. An example entry is provided here:

deb file:/ark/mirror/mirror/pkgmaster.devaun.org/merged daedalus main contrib non-free non-free firmware

WARNING: Make sure this entry is the VERY FIRST entry in your sources.list file

Once done, save your sources.list file, and move to step 2.

## Step 2: installing Apt-Tar

Once you have completed step 1, cd into the SCRIPTS directory, if you left it for any reason. run "ls" again. you will see a script called "deboostrap.sh". Take note of it, but do not run it yet. This is not the debootstrap package itself, do not be fooled. This script will create Bedrock Linux Stratums for each of your mirrored architectrures. First, run the following command:

sudo dpkg –add-architecture (insert one of the architectures you intend to mirror here)

Note: repeat this for each architecture you have mirrored, except your host architecture.

Then:

sudo apt update

If all has gone well, the update should be successful. NOW you can run debootstrap.sh , like so:

sudo chmod +x debootstrap.sh sudo ./deboostrap.sh

This will create all of the stratums, and install the Apt-Tar tool on all of the stratums, including your Master Stratum. When it installs for the Master Stratum, BASH may complain that certain directories already exist. It is safe to ignore these errors.

**NOTE: Do NOT make your Master Stratum "Multi-Arch", you WILL break the system! If you need alternate architecture programs, this is what your other stratums are for!**

If all goes well, the Apt-Tar tool should be installed. If so, you may now move on to Step 3.

### Step 3: How to use Apt-Tar

Assuming Step 2 was completed successfully, the following shall describe how to use Apt-Tar.

When using Apt-Tar, you run it like so:

sudo strat -r (strat name) apt-tar (package name)

This will pull, recursively, all dependencies for the package, and put them into a tar file named "debs-($ARCH).tar.gz", which contains everything you need to install the package on the intended target system.

NOTE: If using the host architecture, the stratum name should be "core". Any other architectures, use the architecture name ie: "amd64" , "i386" , and so on.

Once the tar archive has been transferred to your intended machine, extract it, and cd into the "debs-($ARCH)" directory. Then, run the following command:

sudo chmod +x installdebs.sh

sudo ./installdebs.sh

If all has succeeded, you should now have the packages installed on the target system.

# Congratulations! You have completed Chapter 2. You may now move on to Chapter 3!

# Chapter 3: Creating your Kiwix Archive and offline Maps

### Section 1: Kiwix Archive

There will no doubt come a point when you will need to access knowledge that is otherwise unavailable in this manual, or the Linux MAN Pages. As well as this, there will no doubt come a point where maybe you'll need to know: "is this

plant poisonous?" or "How do I do CPR?" or "How many quarts in one gallon?". In this case, Kiwix will come to your aid. Kiwix is a program that can download offline copies of various wikimedia projects, usually in the form of ".zim" files. These can be downloaded from Kiwix itself, OR they can be downloaded from https://farm.openzim.org

I HIGHLY Recommend you mirror the following: 1. Wikipedia ALL (There is a "no pictures" version that is 15GB, or a full version that is ~90GB in size. I highly recommend the latter, but the former will suffice in a pinch). 2. Wikihow (This one is ~50GB) 3. Wikitionary 4. WikiMed 5. Project Gutenberg Library 6. Wikispecies 7. Appropedia 8. Linux and Unix Stack Exchange 9. AskUbuntu 10. The Arch Linux Wiki 11. The Alpine Linux Wiki

To install Kiwix, Marble (which will be discussed in the next section), and other tools to be discussed in later chapters, run the following command:

sudo chmod +x add-media-tools.sh sudo ./add-media-tools.sh

Once complete, navigate to Kiwix via your GUI. Click on the tab that says "all files", and search for the archives you wish to download. If it is downloaded from zim-farm, you will need to follow a different procedure. You will notice a button shaped like an open folder in the top-right corner. This will allow you to navigate your locally downloaded zim files, and import them into Kiwix.

Zim files downloaded by Kiwix will be found in /home/(user)/.local/share/kiwix

## Section 2: Marble

As previously discussed, the script you ran installed Marble. It is known in the GUI as "KDE Marble". This program has a full world map made from OpenStreetMap data, and can even be used to get directions for certain trips. Be advised, it is not as complete as google maps, and often times you will find yourself getting directions for areas relatively close to your start and end points, rather than the exact ones. I still contend, however, that this is much better than no map at all.

If you have any need to update your map, please go here: https://marble.kde.org/maps-4.5.php

The two most important maps you will need are "MapQuest OSM" and "MapQuest Open Aerial".

When you download these maps, they will come as zip files. The recommended way to install them, according to the Marble website, is to cd into the directory containing the .zip file, and run the follwing command:

unzip -d ~/.local/share/marble/maps ortelius1570-marblemap.zip

FINAL NOTE: The KDE Marble Handbook can be downloaded here: https://docs.kde.org/trunk5/en/marble/marble/marble.pdf it is **highly** advised

that you do so, because the handbook inside the Marble application itself will not work without an internet connection.

## Congrats! You have completed Chapter 3. Move on to the chapter named "Final Chapter", where other important information is found.

## Final Chapter: Use Cases, Other Useful Software, and closing message

### Section 1: Uses of the Stratums

Beyond their use in the Apt-Tar Tool, the stratums installed on the ARK System can also serve other purposes. Namely, they can serve as testing platforms for alternate architecture software. They can also be used to provide software not available to the host architecture. One example of this is the "syslinux-utils" package, which provides the Isohybrid utility. Thus, if one is using an arm or mips based system, the amd64 or i386 stratum can provide this utility. They can ALSO be used to create disposable testing environments. Chroots created via debootstrap can be imported as stratums. such can be done with the following command:

sudo brl import (strat name) /path/to/chroot/directory

NOTE: make sure to not name these with names identical to the ones created earlier in the manual, as this can create problems.

### Section 2: The Debian Blends

One of Debian's shining strengths is her Pure Blends. These blends are installable from the repository, and there are blends for a myriad of vital use cases for (re)building a nation's infrastructure. The Blends, and their Descriptions, are Below:

**Debian Astro**:

"The goal of Debian Astro is to develop a Debian based operating system that fits the requirements of both professional and hobby astronomers. It integrates a large number of software packages covering telescope control, data reduction, presentation and other fields."

**DebiChem**:

"The goal of DebiChem is to make Debian a good platform for chemists in their day-to-day work."

**Debian Games**:

"The goal of Debian Games is to provide games in Debian from arcade and adventure to simulation and strategy"

**Debian EDU**:

"The goal of Debian Edu is to provide a Debian OS system suitable for educational use and in schools."

**Debian GIS**:

"The goal of Debian GIS is to develop Debian into the best distribution for Geographical Information System applications and users."

**Debian Junior**:

"The goal of Debian Junior is to make Debian an OS that children will enjoy using."

**Debian Med**:

"The goal of Debian Med is a complete free and open system for all tasks in medical care and research. To achieve this goal Debian Med integrates related free and open source software for medical imaging, bioinformatics, clinic IT infrastructure, and others within the Debian OS."

**Debian MultiMedia**:

"The goal of Debian Multimedia is to make Debian a good platform for audio and multimedia work."

**Debian Science**:

" The goal of Debian Science is to provide a better experience when using Debian to researchers and scientists."

**FreedomBox**:

"The goal of FreedomBox is to develop, design and promote personal servers running free software for private, personal communications. Applications include blogs, wikis, websites, social networks, email, web proxy and a Tor relay on a device that can replace a wireless router so that data stays with the users."

**Debian HamRadio**:

"The goal of Debian Hamradio is to support the needs of radio amateurs in Debian by providing logging, data mode and packet mode applications and more."

**DebianParl**:

"The goal of DebianParl is to provide applications to support the needs of parliamentarians, politicians and their staffers all around the world."

**Debian Design**:

"The goal of Debian Design is to provide applications for designers. This includes graphic design, web design and multimedia design."

**How to install each blend**

The following list will provide the names of the packages needed to install the aforementined blends.

NOTE: Do **NOT** install these directly onto an ARK system, unless there is an absolute dire need for them! These are meant for the systems the ARK is used to maintain!

**Debian Astro**: astro-all astr-catalogs astro-tcltk

**DebiChem**: debichem-visualisation debichem-view-edit-2d debichem-semiempirical debichem-periodic-abinitio debichem-molecular-modelling debichem-molecular-dynamics debichem-molecular-abinitio debichem-input-generation-output-processing debichem-development debichem-crystallography debichem-cheminformatics debichem-analytical-biochemistry

**Debian Games**: games-finest games-adventure games-arcade games-board games-c++-dev games-card games-chess games-console games-content-dev games-education games-emulator games-fps games-java-dev games-minesweeper games-mud games-perl-dev games-platform games-programming games-puzzle games-python3-dev games-racing games-rogue games-rpg games-shootemup games-simulation games-sport games-strategy games-tetris games-toys games-typing

**Debian-Edu**: debian-edu-config education-desktop-$DE

NOTE: $DE is substitiuted for mate, cinnamon, kde, gnome, lxde, or xfce. Chose only ONE.

**Debian GIS**: gis-all gis-data gis-gps gis-remotesensing gis-statistics gis-web

**Debian Junior**: junior-art junior-config junior-doc junior-education junior-games-adventure junior-games-arcade junior-games-card junior-games-gl junior-games-net junior-games-puzzle junior-games-sim junior-games-text junior-internet junior-math junior-programming junior-sound junior-system junior-toys junior-typing junior-video junior-writing

**Debian Med**: med-all med-cloud med-data med-dental med-epi med-his med-imaging med-imaging-dev med-laboratory med-oncology med-pharmacy med-physics med-practice med-physiology med-research med-tools med-typesetting

NOTE: For Debian Med, You often only need SOME of these. It is up to the system administrator to decide which is needed.

**Debian MultiMedia**: multimedia-all multimedia-devel

**Debian Science**: science-all science-biology science-chemistry science-economics science-electrophysiology science-engineering science-engineering-dev

science-financial science-geography science-geometry science-highenergy-physics science-highenergy-physics-dev science-linguistics science-logic science-mathematics science-mathematics-dev science-meteorology science-meteorology-dev science-nanoscale-physics science-nanoscale-physics-dev science-neuroscience-cognitive science-neuroscience-modeling science-physics science-physics-dev science-psychophysics science-robotics science-robotics-dev

NOTE: For Debian Science, You often only need SOME of these. It is up to the system administrator to decide which is needed.

**Freedombox**: freedombox freedombox-doc-en freedombox-doc-es freedombox-setup

**Debian HamRadio**: hamradio-all

**DebianParl**: parl-desktop parl-desktop-eu parl-desktop-strict parl-desktop-world

NOTE: For DebianParl, You often only need ONE of these. It is up to the system administrator to decide which is needed.

**Debian Design**: design-desktop design-desktop-web design-desktop-animation design-desktop-graphics design-desktop-strict

NOTE: For Debian Design, You often only need ONE of these. It is up to the system administrator to decide which is needed.

These blends, as you can see, are numerous and wide in scope. There is very few use cases for the modern age that are not in some way covered by these blends. They, in the scenarios for which the ARK is intended, are the lifeblood of achieving the intended bottom line of using the ARK system.

## Final Message. . .

For as long as humans have existed, adversity has been a constant companion. Whether it be authoritarian regimes, natural distasters, economic collapse, wars, or whatever else have us, adversity has been present. From the destruction of Alexandria's library, to the Nazi's burning of books, to more modern adversities such as cyberattacks, terrorism on infrastructure, or severe economic hardship, there have been many examples throughout history where a machine like the ARK System would have made an incredible difference. You, as the owner of an ARK System, carry a responsibility to your fellow humans, and to the future of your people. You carry a responsibility to protect their collective knowledge at all costs, and to help them (re)build their society when the time is right. And remember, the ARK System is founded upon the Three R's: Rise, Respond, Rebuild.

**Good luck, and may your ARK Serve you well**