

# Distribution Packaging Design / Comparison of Packaging Solutions



This page documents our decision process for initial DATIM / OpenHIE packaging strategy in 2015.

## Upfront Presumptions:

- Implementers of this package will be "interested parties", to include ministries of Health, large implementing partners, and other country stakeholders.
- The OpenHIE DATIM distro will include functionality to support 1.0 OpenHIE workflows, plus additional pre-release versions of metadata synchronization and aggregate data exchange workflows
- All reference OpenHIE components will be included in the package
- Implementation site requirements include:
  - Single server-level computer (specs to be determined) with a Linux-based OS installed
  - Working, active internet connection
  - Expertise in the installation of Linux-based software, modification of configuration files

## Approach being considered:

- Two-pronged packaging approach:
  - Installer packaging process for those with a machine available at the location of the implementation
  - Cloud-hosted images through 1 or 2 service providers for those who want to work with a remotely hosted service

## Binary / Standalone

A binary or standalone package usually consists of a .zip or .tar.gz file that will first need to be extracted. After extraction, a binary or script is executed to run the application.

### Pros

- No additional software should need to be installed.
- Does not require any specific hardware support.
- Does not require internet access for installation.
- Performance is great.
- Easiest to install.

### Cons

- Specific binaries need to be created for each OS supported.
- No easy way of getting updates.
- Requires extra effort from software maintainers to put the standalone package together.

## Installer Packages

Installer packages consist of platform specific packages that, when executed, install the application to a specific directory and also can run some post installation configuration. File extensions typically are .exe or .msi for Windows and .deb or .rpm for linux.

### Pros

- Does not require any specific hardware support.
- Performance is great.
- Easily updated if configured to use a repository.
- Easy to install using native OS tools.

### Cons

- May require extra software dependencies.
- Packages are specific to OS.
- Installation may require internet access.

## Virtual Machine Image

Virtual machine images consist of a base operating system with the application preinstalled and preconfigured. This is then distributed as a .ova or .vmdk files.

### Pros

- Does not require a specific base OS.
- Easy to install.
- Easy to upgrade after initial install. \*(If updating packages in the virtual machine.)

### Cons

- Requires VM software to be installed (e.g. VirtualBox)
- Requires Hardware support
- Performance is not as good as native.

## Docker image

A docker images consists of virtual container containing a minimal OS and the application pre installed and preconfigured. The most common form of distribution is in a source repository, or through Docker Hub.

### Pros

- Performance is very close to native.
- Easy to get new updates once installed.

### Cons

- Requires docker and base os it be installed before running image.
- Requires Hardware support on non linux OS.
- Host OS and image OS must match. (e.g. Linux os will run only linux images.)
- Requires internet access to get base image

## Cloud Host Image

A cloud host image is a pre made virtual machine image built to run on a specific cloud hosting provider. The most common format is Amazon's Amazon Machine Image(ami).

### Pros

- Easy to setup when using Amazon EC2.
- Performance is good with the option to scale up using EC2.
- Easy to upgrade after initial install. \*(If updating packages in the vm.)

### Cons

- Requires internet access for installation AND operation.
- Cost of running EC2 instances.

Packaging Solution	Requires Additional Software	Requires Hardware Support	Requires Operating System Support	Requires Internet Access	Performance (1-5)	Ease of Install(1-5)	Easy to update
Standalone Binary	No	No	Standalone is specific to OS	No	5	5	No
Installer Packages	Yes, dependencies	No	Packages are specific to OS	Yes	5	4	Yes
Virtual Machine Images	Yes, VM software	Yes, AMD-V or VT-x	No	No	3	4	Yes*
Docker Images	Yes, docker and OS img	Yes, if using boot2docker	Host os and docker OS must match	Yes	4.5	2	Yes
Cloud Host Images	N/A	N/A	N/A	Yes, even for operation.	5	5*	Yes*

## Blockers for each packaging method

### Standalone Binary

You should not use the standalone binary if any of these are true.

- Need easy updates in the future.
- Using a non supported OS

### Installer Packages

You should not use the installer packages if any of the following are true.

- No internet access during install. This prevents installation of additional software.
- Using a non supported OS.

## Virtual Machine Images

You should not use the virtual machine images if any of the following are true.

- Do not have hardware support for virtualization.
- If you do not have internet access and do not have virtualization software already installed.
- Need the maximum amount of performance from your hardware.

## Docker Image

You should not use the Docker image if any of the following are true.

- You need an easy to install method.
- Using a non linux OS and do not meet the hardware virtualization requirements.
- No internet access during install and do not have docker and all images needed to run the application.

## Cloud Host Image

You should not use the Cloud hosting image if any of the following are true.

- You do not have reliable internet access.
- You need your data on site.
- Cloud provider is too expensive.