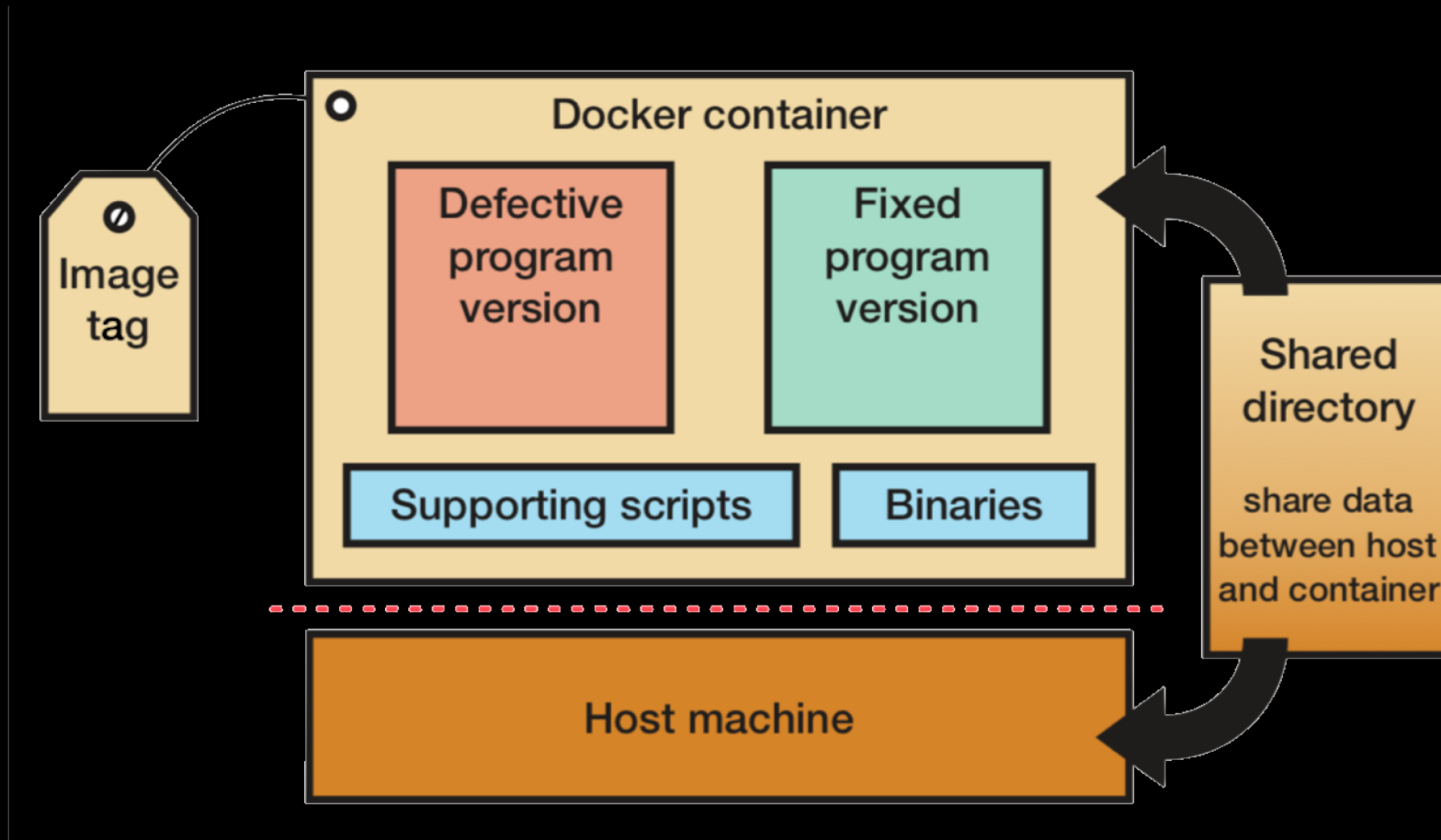


Improving Durability of Software Execution

Present by: Tony

Background

- Anatomy of an artifact



```
<?xml version="1.0" encoding="utf-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/maven-v4_0_0.xsd">
  <!-- ===== -->
  <!-- P A R E N T P R O J E C T D E S C R I P T I O N -->
  <!-- ===== -->
  <name>
    ACS AEM Commons - Reactor Project
  </name>
  ...
  <dependencyManagement>
    <dependencies>
      <dependency>
        <artifactId>
          osgi.core
        </artifactId>
        <version>
          6.0.0-SNAPSHOT
        </version>
      </dependency>
    </dependencies>
  </dependencyManagement>
  <repositories>
    <repository>
      <id>
        adobe-public-releases
      </id>
      <url>
        https://repo.adobe.com/nexus/content/groups/public/
      </url>
    </repository>
    ...
  </repositories>
```

Motivating Example

```
pip3 install --upgrade pip
```



Want

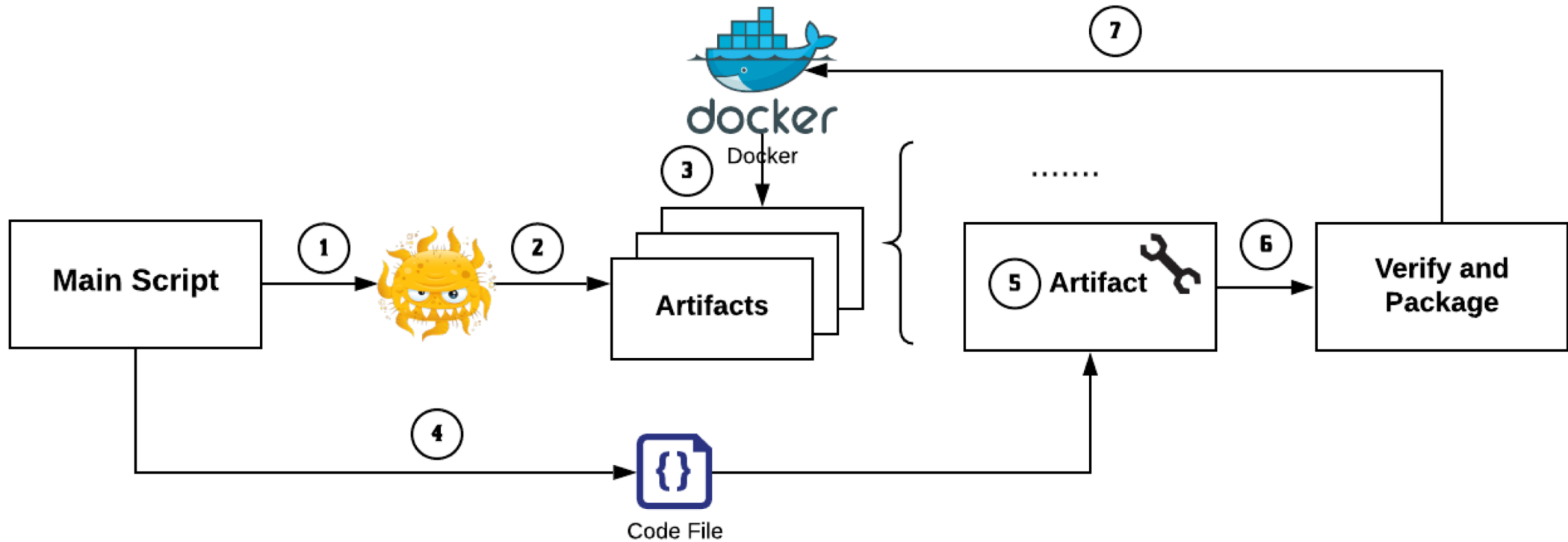
```
pip --version => 9.0.1
```



Get

```
Pip --version => 18.0.1
```

Overview



Research Question

RQ 1 . How likely artifacts remain reproducible(behave the same) after caching dependencies?

Trial	Reproducible	Broken	Total	Success Rate
1	37	3	40	92.5%
2	112	13	125	89.6%

Research Question

RQ 2. What is the percentage increases after caching all dependencies?

Image Tag	Original Size		Size Increase		Percentage Increase
Adobe-Consulting-Services-acs-aem-commons-427338776	10.6GB		723MB		6.80%
tananae 952330	Number of Images	Maximum	Minimum	Average	
	165	26%	1%	6%	
SynBioD 88818413					
Nukkit-Nukkit-172723553	5.49GB		91.6MB		1.7%
Azure-azure-sdk-for-java-136721922	5.85GB		126MB		2.20%

Next Step

1. Run the tool across more artifacts to gather more data
2. Keep improving the tool to cover more cases
3. Periodically test artifacts to measure the long-term reproducibility

Questions?