GUI Technologies

**Overview:** This document will be used to record container technology system and container orchestration system designs according to the most commonly used open-source containerization frameworks. Brief descriptions that summarize their use-cases, technical features, and integration will be provided as will their strengths and weaknesses. Using critical and soft requirements itemized in the project requirements document, tables will be assembled in a spreadsheet for each system category in the stretch and smart product designs for the purpose of performing a Feasibility Analysis to determine the most suitable designs for each system to down select into the detailed design/prototype-testing phase.

**Containerization Technology System**

**1) Preliminary Design #1: Docker**

**Definition:** Docker is containerization tool that enables the development of containers, or, standard units of software that package up all code and their dependencies so that an application can run quickly and reliably from one computing environment to another. Docker container images are lightweight, standalone, executable packages of software that include everything that is needed to run an application: code, runtime, system tools, system libraries and settings. A container image becomes a container at runtime, and in the specific case of Docker, the images become containers once they run on their specialized runtime software.

**Technical Design of Docker Runtime Environment**

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**Strengths**

1) They use minimal system resources

2) Cost-Effective

3) Offer Instant Portability

4) Easy Cloud Deployment

5) CI/CD Support

6) Permit Fast Delivery Cycles

**Weaknesses**

1) Don't support full-system container operations

2) Engine only supports Docker container format

3) Poor monitoring/benchmarking capabilities

4) Difficult persistent data storage

5) Security Vulnerabilities

6) Slow Application Performance

7) Restrictions with GUI's

8) Data Volume Limitations

9) Restrictions with multiple kernels and OS