Fine-Grained Protection for Scalable Single-use Services

Challenge:
- Web application software is ubiquitous and often has security defects.
- Adversaries exploit these defects to harm web servers and those visiting the servers.

Solution:
- Provide clients with cloned instances of web servers to prevent interactions.
- Tailor permissions associated with web instances to only what the client needs.
- Log actions to create forensics.
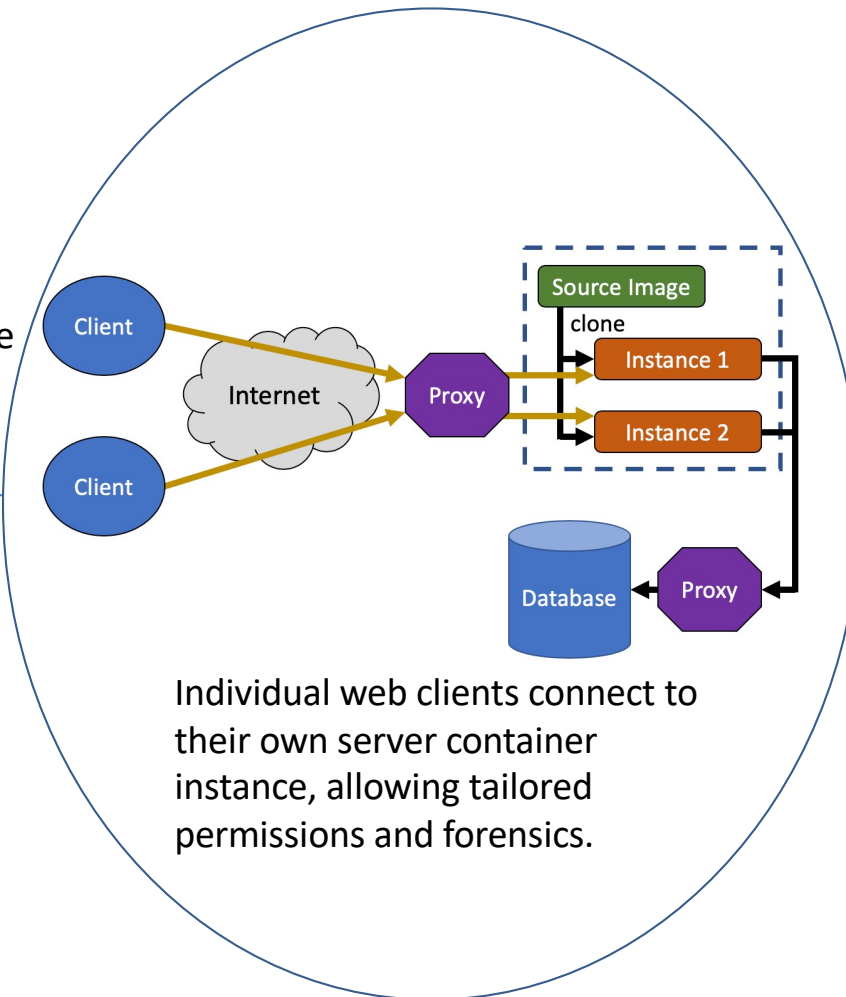
Individual web clients connect to their own server container instance, allowing tailored permissions and forensics.

Scientific Impact:
- The project explores efficient container cloning and management, allowing isolation with limited overheads.
- Fusing data from multiple vantage points allows new insight into attacker methods.

Broader Impact and Broader Participation:
- The technology allows websites to take existing web applications and containerize them to limit risk to themselves and visitors.
- The technology can be used by web hosting providers to protect even vulnerable web applications.
- Project incorporated into curriculum and supported REU students.