Research Results: Better, Faster, Sooner through Artifacts Sharing

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Our Community’s Challenges & Needs

• Sharing of repeatable, reproducible, and reusable artifacts in cybersecurity experimentation
  • Can greatly enhance one’s ability to build upon the work of others
  • Helps in comparing solutions.

• Sharing artifacts can be difficult and time-consuming
• Finding relevant experiments and artifacts can be challenging and time-consuming
• We need:
  ✓ Broad sharing of experiment artifacts
  ✓ Solution that facilitates rapid and open community sharing and reuse
Artifacts-sharing Hub Concept of Operations

Collaborative, community-driven platform that lowers barrier to sharing and reuse
✓ Assisted sharing through importing tools
✓ Smart search feature using rich domain-specific semantics
✓ Enable community to exchange experience with artifacts

• Main user workflows:
  • Share artifacts & experience
  • Consume artifacts & experience
The Hub Stores Artifact Metadata

The SEARCCH Hub does not store artifacts directly; rather it
• stores a rich metadata representation of artifacts,
• enables researchers to quickly vet artifact relevance to their work and
  then access actual artifacts in their native location

<table>
<thead>
<tr>
<th>Artifact Title, Description, and Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Descriptor / Research Domain</td>
</tr>
<tr>
<td>Research Questions and Hypothesis</td>
</tr>
<tr>
<td>Methodology</td>
</tr>
<tr>
<td>Metrics</td>
</tr>
</tbody>
</table>
| Dataset
  • Type (several options plus freestyle entry)
  • Time of collection
  • How/where it was collected
| Source Code - any script, research product, traffic generator, simulation, etc.
  • Description
  • Role in the experiment (e.g., research code, simulator, orchestration code, etc.)
  • Language
  • Dependencies
  • How long it runs
  • Any special memory, CPU, hardware, OS requirements
| Publication
  • Type (e.g., journal article, conference, whitepaper, blog post, technical report, thesis (MS/PhD), book, instructions (installation, use), citation)
  • Where published
| Year of publication
| References
| Executable - specific binaries used in experiment
  • Type
  • Purpose
  • Supporting Information
  • Visuals
  • Supplements
  • Tutorial
| Organization - metadata at the collection level
  • Type (e.g., company, academia, government)
  • Name
  • Group
| System Environment
  • Testbed
  • Resources
| License
  • Type
  • Restrictions
| Domain (aka., Research Applications)
  • Current
  • Potential

Note: source code details, if captured in the source’s README file will show up in the hub as part of the text description.
Fundamental Research Design Question

• Determine how to best represent cybersecurity experiment artifacts and the relationships between them and develop an optimized data model that facilitates the efficient artifact discovery
  1) Manually cataloged cybersecurity artifacts to better understand existing artifact features and the breadth of artifacts
  2) Performed automated “mining” of cybersecurity related artifacts from Zenodo as test subjects
  3) Implemented a general artifact "importer tool"
• Once fully operational, we expect most of the hub's catalog to come from user contributions, not automated mining
Current Hub Features & Capabilities

• Search hub repository for artifacts

• For found artifacts
  • View
  • Favorite
  • Rate
  • Review
  • See other reviews

• Import new artifacts
SEARCCH Hub Demo
Questions for the Community

• What did you like about the hub features you saw?
• What features should be changed and how?
• What additional functionality should we consider?
SEARCCH Beta Program

• Opening for Beta use in mid-January
• Training session
  • Probably 2\textsuperscript{nd} week of January
  • Get set up with account
  • Bring an artifact to import
• Open beta program to more users
  • Probably end of January

• For more information
  • Talk to us
  • Follow us on Twitter: @SEARCCH_Hub
  • Visit us on the web: https://searcch.cyberexperimentation.org
  • Send us email: beta-test@searcch.cyberexperimentation.org