Resource-Oriented Lightweight Information Exchange (ROLIE)
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The Problem

- Organizations require many kinds of security information from many sources in many formats in many serializations—open world problem!

- Information distribution requires prior coordination and agreement on these factors

- Once information is negotiated and shared, there is no good way to negotiate historical information.
Message-Oriented Publish/Subscribe Model

- Producer
  - Publishes Message
  - Joins Community
  - Joins Community later
- Consumer A
- Consumer B
- Consumer C

Consumer C lacks knowledge of historic messages
Message-Oriented Request/Response Model

What if the resource or search term is unknown?
The Goals of ROLIE

- Provide metadata to allow clients to discover and search information resources
- Minimize the retrieval of unneeded information and reduce round trips
- Provide granular control of access to resources in order to support public and private information exchange
- Enable automatic machine communication and information processing
ROLIE as a Solution

- The Resource-Oriented Lightweight Resource Exchange (ROLIE) is a profile of the Atom Publication Protocol and the Atom Syndication Format.

- Allows collections of security information resources to be discovered without prior knowledge of the information.

- Provides an extensible mechanism to characterize different types of security information resources
Resource-Oriented Discovery Model

Available resources can be discovered, and interesting resources can be searched and retrieved.
Publication/Subscription protocol (e.g., XMPP) can be used with the Resource-Oriented approach to provide notifications of new information.
Anatomy of a ROLIE Service Document

<?xml version="1.0" encoding="UTF-8"?>
<service xmlns="http://www.w3.org/2007/app"
    xmlns:atom="http://www.w3.org/2005/Atom">
  <app:workspace>
    <app:collection>
      <atom:title>Public Vulnerabilities</atom:title>
      <app:categories fixed="yes">
        <atom:category scheme="urn:ietf:params:rolie:information-type" term="vulnerability"/>
      </app:categories>
    </app:collection>
  </app:workspace>
</app:service>

Defines the type of information contained within a collection
Anatomy of a ROLIE Feed

```xml
<?xml version="1.0" encoding="UTF-8"?>
<atom:feed xmlns="http://www.w3.org/2005/Atom">
    <atom:id>http://example.org/provider/vulns</atom:id>
    <atom:title>Public Vulnerabilities</atom:title>
    <atom:category scheme="urn:ietf:params:rolie:information-type"
                    term="vulnerability" />
    <atom:link rel="self" href="http://example.org/provider/vulns" />  
    <atom:link rel="service" href="http://example.org/rolie/servicedocument" />
    <atom:entry>
        ...
    </atom:entry>
</atom:feed>
```

Defines the type of information contained within a collection. Same as defined in the service document.

Points to the service document associated with this feed.
Anatomy of a Paged ROLIE Feed

<?xml version="1.0" encoding="UTF-8"?>
<atom:feed xmlns="http://www.w3.org/2005/Atom">
  ...
  <atom:link rel="self" href="example.org/provider/vulns?page=5"/>
  <atom:link rel="first" href="example.org/provider/vulns?page=1"/>
  <atom:link rel="prev" href="example.org/provider/vulns?page=4"/>
  <atom:link rel="next" href="example.org/provider/vulns?page=6"/>
  <atom:link rel="last" href="example.org/provider/vulns?page=10"/>
  ...
</atom:feed>

Provides link relations for navigation through paged feed entries.
Anatomy of a ROLIE Entry

```xml
<?xml version="1.0" encoding="UTF-8"?>
<atom:entry xmlns="http://www.w3.org/2005/Atom"
    xmlns:rolie="urn:ietf:params:xml:ns:rolie-1.0">
  <atom:id>http://www.example.org/provider/vulns/123456</id>
  <atom:title>Sample Vulnerability</title>
  <atom:updated>2012-08-05T18:13:51Z</updated>
  <rolie:format ns="urn:ietf:params:xml:ns:iodef-2.0"/>
  <atom:content type="application/xml"
      src="http://www.example.org/provider/vulns/123456/data"/>
</atom:entry>
```

Provides information about the data model of the content.

Content is linked to, not embedded.
The ROLIE extension system

- The Atom Category element provides a flexible extension point for characterizing information and for declaring information types.

- List of officially supported information types registered in IANA table by extensions.

- Example: “ROLIE CSIRT Extension” document creates IANA table entries for:
  - Information Types: Incidents, Indicators
ROLIE Software Descriptor Extension

- Establishes the “software descriptor” information type
  - Identifies and characterizes software, software installers/packages, and software patches.
  - Software descriptors do not characterize installation records, running software, or configuration state

- Lists ISO 2015 SWID Tags as a data format that expresses this information type
Looking Forward

- ROLIE draft -08 version recently posted in MILE. WGLC finished, shepharding process starting.

- ROLIE Software descriptor extension WG adoption
  - Draft version -02 with minor edits soon, mostly changes to reflect changes in -07 and -08 of core draft

- ROLIE Checklist extension review and updates
Discussion