TRAINING DAY15 REPORT:

Topic: TOTP Apps, Two-Factor Authentication, and Advanced SPARQL Queries

Overview: The fifteenth day of the TR-102 training introduced participants to Time-based One-Time Password (TOTP) apps and the setup of two-factor authentication (2FA) on GitHub accounts. The session also included further exploration of SPARQL queries.

TOTP Apps and Two-Factor Authentication:

Introduction to TOTP:

- **TOTP (Time-based One-Time Password):** A temporary passcode generated by an algorithm for use in two-factor authentication (2FA).
- **Purpose:** Enhances security by requiring a second form of verification in addition to the standard password.

Setting Up Two-Factor Authentication on GitHub:

- **Downloading TOTP Apps:** Participants downloaded TOTP apps such as Google Authenticator or Authy on their mobile devices.
- **Enabling 2FA on GitHub:**
  - **Navigation:** Participants navigated to their GitHub account settings.
  - **Security Settings:** Enabled two-factor authentication.
  - **QR Code:** Scanned the QR code provided by GitHub using their TOTP app.
  - **Verification:** Entered the generated code to complete the setup.

Benefits of 2FA:

- **Increased Security:** Adds an additional layer of protection, making it harder for unauthorized users to access accounts.
- **Authentication Flexibility:** Allows users to authenticate via a device in their possession.

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Advanced SPARQL Queries:

Review of SPARQL Basics:

- **SPARQL Syntax and Concepts:** Recapped key elements such as PREFIX, SELECT, FROM, and WHERE.
- **Basic Query Example:**

```
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT ?name
WHERE { ?person foaf:name ?name }
```

Advanced SPARQL Query Topics:

- **SELECT and WHERE:** Crafting more complex queries using these basic clauses.
- **LIMIT and OFFSET:** Controlling the number of results returned and paginating through results.

```
SELECT ?name
WHERE { ?person foaf:name ?name }
LIMIT 10
OFFSET 20
```

- **ORDER BY:** Sorting query results based on specific criteria.

```
SELECT ?name
WHERE { ?person foaf:name ?name }
ORDER BY ASC(?name)
```

- **FILTER:** Filtering results based on conditions.

```
SELECT ?name
WHERE {
  ?person foaf:name ?name .
  FILTER regex(?name, "^A")
}
```

- **FILTER NOT EXISTS:** Excluding specific results.

```
SELECT ?name
WHERE {
  ?person foaf:name ?name .
  FILTER NOT EXISTS { ?person foaf:age ?age }
}
```

- **DESCRIBE:** Returning a description of resources.

  ```
  DESCRIBE ?person
  WHERE { ?person foaf:name "Alice" }
  ```

- **SELECT * WHERE:** Selecting all data that matches the pattern.

  ```
  SELECT *
  WHERE { ?s ?p ?o }
  ```

- **OPTIONAL:** Including optional patterns in the query results.

  ```
  SELECT ?name ?age
  WHERE {
    ?person foaf:name ?name .
    OPTIONAL { ?person foaf:age ?age }
  }
  ```

Practical Exercises:

- Participants implemented various SPARQL queries using Apache Jena Fuseki to retrieve and manipulate data from RDF datasets. This reinforced their understanding of query structures and how to apply them effectively.

Conclusion:

Day 15 of Training TR-102 provided participants with valuable knowledge and skills in setting up TOTP-based two-factor authentication on GitHub, significantly enhancing account security. The session also deepened participants' understanding of SPARQL queries, equipping them with advanced techniques for querying and manipulating semantic data. These competencies are crucial for developing secure, data-driven web applications and leveraging the full potential of semantic web technologies.