Spring Security

Beginner to Guru

Two Factor Authentication Overview

Two Factor Authentication Overview

- Two Factor Authentication is a type of multi-factor authentication
  - Also called 2FA
- 2FA Authentication requires the user to present two or more authentication factors
- Goal is to prevent unauthorized account access from account password being compromised
- Could be as simple as username, password, and code sent via text message
  - Thus, user needs to know password and have device receiving text message code
- 2FA should use two different Authentication factors

Authentication Factors

- **Something You Have** - A bank card, a USB Key with code (like Yubikey), FOB with code
- **Something You Know** - Knowledge of the user - password, PIN, security question
- **Something You Are** - Biometric - fingerprint, iris or face scan
- **Somewhere You Are** - A location physical, or GPS based

Time-Based One-Time Password

- Time-Based One-Time Password - Unique code, valid for ~30 seconds
  - aka TOTP
- Adopted by Internet Engineering Task Force (IETF) under RFC 6328
- Algorithm based on Unix time
  - Integer of seconds since January 1, 1970 (dropping any leap seconds)
- Uses a shared 'secret', which if compromised will allow attacker to generate codes

Google Authenticator

- Open Source TOTP generator for Android or iOS
  - Allows user to easily setup TOTP via scanning a QR Code
- QR Code generated using
  - Label - Account Name (username)
  - Secret - Arbitrary key value Base32 encoded (shared secret, should be protected)
    - Unique to user
  - Issuer - Organization Issuing TOTP

Authenticator Test

Scan with Authy App

Enter Verification Token:

i.e. 123 456

Verify

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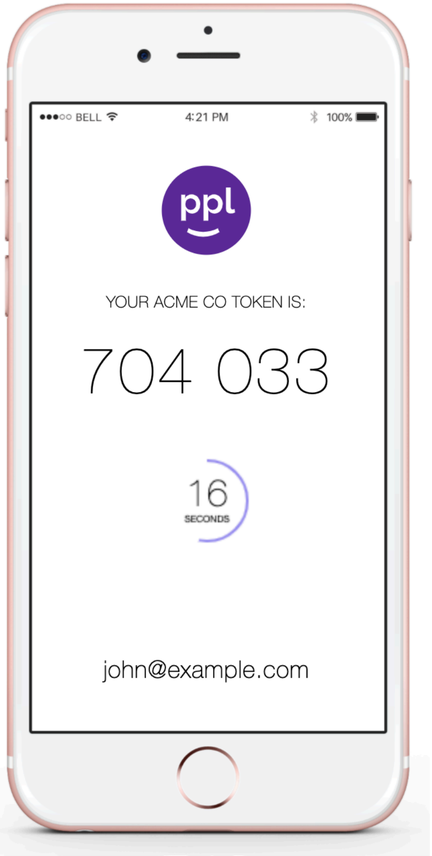
BELL
4:21 PM
100%
ppl
YOUR ACME CO TOKEN IS:
704 033
16
SECONDS
john@example.com

Google Authenticator

- QR Code Generation URI
  - otpauth://TYPE/LABEL?PARAMETERS
  - otpauth://totp/ACME%20Co:john@example.com?secret=HXDMVJECJJWSRB3HWIZR4IFUGFTMXBOZ&issuer=ACME%20Co&algorithm=SHA1&digits=6&period=30

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