

# **CS489: Applied Software Development**

Author: Prof. O. Kalu  
MIU Computer Science - November 2023

Lesson 9:

Security

# Wholeness

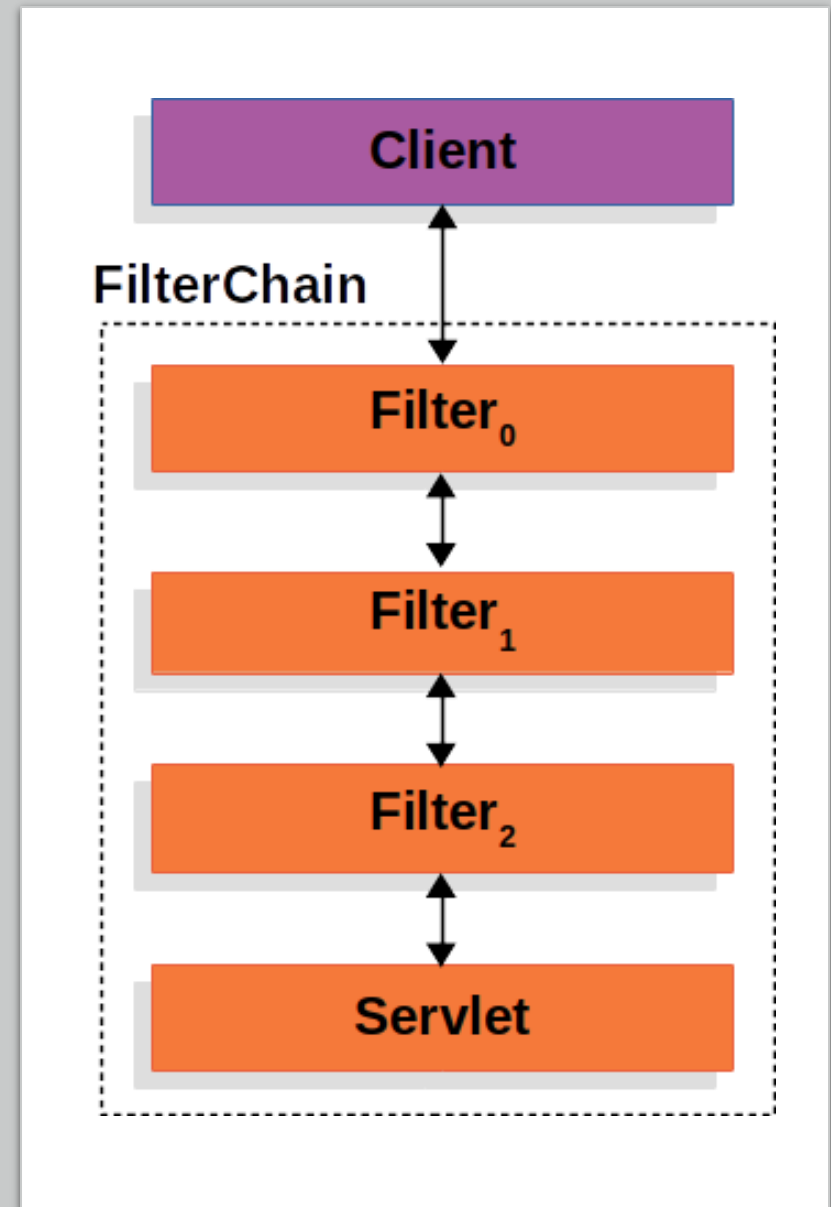
- Software Security describes methodologies, framework, processes and strategies for enhancing security and reducing vulnerabilities within software and its execution environment.
- Spring security offers a highly customizable authentication and access-control framework for Spring-based applications.
- Science of Consciousness: Action leads to Achievement. *Achievement leads to Fulfillment.*

# Aspects of Security

- Authentication: process of verifying a user's identity. Ascertaining that someone is who they claim to be (e.g. userID and password)
- Authorization: mechanism for establishing access-level and granting appropriate rights and privileges.
- Cryptography: Techniques for securing communication through Data encryption

# Key Concepts in Spring Security

- **SpringSecurityFilterChain:** For Servlet-driven Spring web applications, the Filter chain plays the central role for securing a given HTTP Request URI path.
- **Spring Boot Auto Configuration:** Simply adding the dependency named, `spring-boot-starter-security`, enables default config



# Types of Authentication Mechanisms supported by Spring Security

- HTTP Basic Authentication: enabled in HTTP server or Servlet container
- Form-based, custom Database Authentication: Where we use a Database to store/authenticate the user credentials.
- LDAP-driven Authentication. e.g. Microsoft Windows Active Directory service
- OAuth/OpenID Connect Authentication e.g. Login with Google or Microsoft or Github or Facebook account
- Token-based Authentication: Using JSON web token (JWT)

# Spring Security API

- **AuthenticationManager**: is an interface with just one method named, `authenticate`, which processes an `Authentication` request.
- **AuthenticationProvider**: an interface that can be implemented by one or more classes that provide `Authentication` service using a given authentication mechanism e.g.  
`DaoAuthenticationProvider`,  
`LdapAuthenticationProvider`,  
`JwtAuthenticationProvider` etc.

# Implementing Spring Security for a webapp – Coding Demo



The slide features decorative curved lines in the corners. In the top right, there are two overlapping curved lines, one light orange and one light grey. In the bottom left, there are three overlapping curved lines, one light orange, one light grey, and one light blue.

# **CS489: Applied Software Development**