We will see how to configure In Memory user and jwt authentication using latest spring boot 3.0. We will create one protected endpoint and try to secure endpoint using spring boot security.

Create new Spring Boot Project

Go to spring initialize and create new project with dependencies
add the following dependencies
For Web

```
<dependency>
	<groupId>org.springframework.boot</groupId>
	<artifactId>spring-boot-starter-web</artifactId>
</dependency>
```

For security

```
<dependency>
	<groupId>org.springframework.boot</groupId>
	<artifactId>spring-boot-starter-security</artifactId>
</dependency>
```

Lombok

```
<dependency>
	<groupId>org.projectlombok</groupId>
	<artifactId>lombok</artifactId>
	<optional>true</optional>
</dependency>
```

```
  <!-- https://mvnrepository.com/artifact/io.jsonwebtoken/jjwt-api -->
<dependency>
        <groupId>io.jsonwebtoken</groupId>
        <artifactId>jjwt-api</artifactId>
        <version>0.11.5</version>
</dependency>


          <!-- https://mvnrepository.com/artifact/io.jsonwebtoken/jjwt-impl -->
<dependency>
        <groupId>io.jsonwebtoken</groupId>
        <artifactId>jjwt-impl</artifactId>
        <version>0.11.5</version>
        <scope>runtime</scope>
</dependency>

<dependency>
        <groupId>io.jsonwebtoken</groupId>
        <artifactId>jjwt-jackson</artifactId> <!-- or jjwt-gson if Gson is prefer
        <version>0.11.5</version>
        <scope>runtime</scope>
</dependency>
```

Create End Point to be secured

```
@RestController
public class HomeController {

        Logger logger = LoggerFactory.getLogger(HomeController.class);

        @RequestMapping("/test")
        public String test() {
                this.logger.warn("This is working message");
                return "Testing message";
        }
```

Create InMemory user with UserDetailService Bean

Create CustomConfig class and create bean and also create two important bean PasswordEncoder and AuthenticationManager so that we can use later.

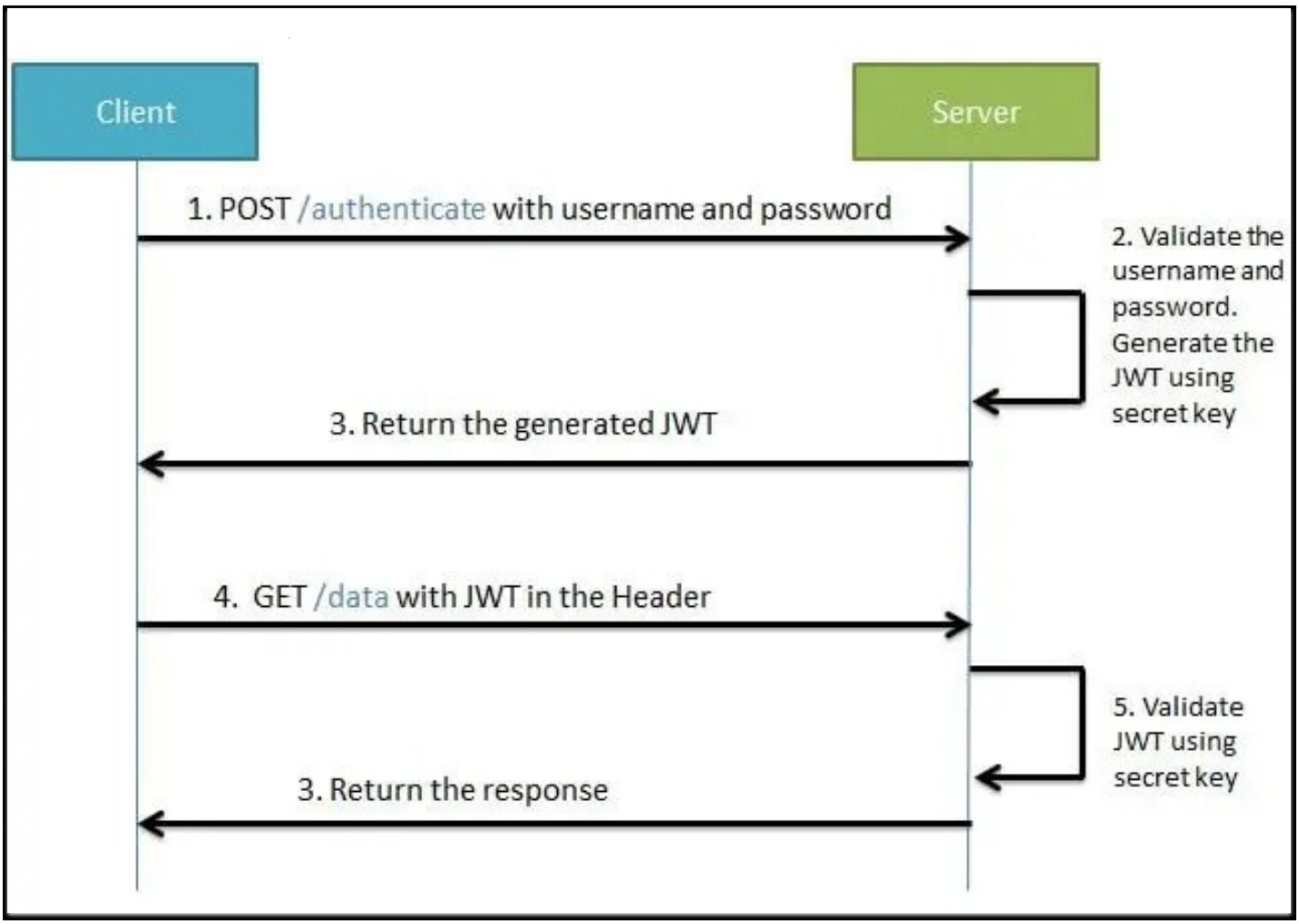
```
@Configuration
class MyConfig {
	@Bean
	public UserDetailsService userDetailsService() {
		UserDetails userDetails = User.builder().
				username("DURGESH")
				.password(passwordEncoder().encode("DURGESH")).roles("ADMIN")
				build();
		return new InMemoryUserDetailsManager(userDetails);
	}

	@Bean
	public PasswordEncoder passwordEncoder() {
		return new BCryptPasswordEncoder();
	}

	@Bean
	public AuthenticationManager authenticationManager(AuthenticationConfigur
		return builder.getAuthenticationManager();
	}
}
```

Now we can login with given username and password by default spring security provide form login .
open browser and open

```
http://localhost:8080/test
```

when login form is prompted just login with username and password as given .

JWT Authentication Flow



Steps to implement jwt token:

1) Make sure`spring-boot-starter-security` is there in pom.xml

2) Create Class `JWTAthenticationEntryPoint` that implement`AuthenticationEntryPoint`. Method of this class is called whenever as exception is thrown due to unauthenticated user trying to access the resource that required authentication.

```
@Component
public class JwtAuthenticationEntryPoint implements AuthenticationEntryPoint
	@Override
	public void commence(HttpServletRequest request, HttpServletResponse resp
	response.setStatus(HttpServletResponse.SC_UNAUTHORIZED);
		PrintWriter writer = response.getWriter();
	writer.println("Access Denied !! " + authException.getMessage());
	}
}
```

3) Create **`JWTHelper`** class This class contains method related to perform operations with jwt token like generateToken, validateToken etc.

```
@Component
public class JwtHelper {

	//requirement :
	public static final long JWT_TOKEN_VALIDITY = 5 * 60 * 60;

	//    public static final long JWT_TOKEN_VALIDITY =  60;
	private String secret = "afafasfafafasfasfasfafacasdasfasxASFACASDFACASDF

	//retrieve username from jwt token
	public String getUsernameFromToken(String token) {
		return getClaimFromToken(token, Claims::getSubject);
	}

	//retrieve expiration date from jwt token
	public Date getExpirationDateFromToken(String token) {
		return getClaimFromToken(token, Claims::getExpiration);
	}

	public <T> T getClaimFromToken(String token, Function<Claims, T> claimsRe
		final Claims claims = getAllClaimsFromToken(token);
		return claimsResolver.apply(claims);
	}

	//for retrieveing any information from token we will need the secret key
	private Claims getAllClaimsFromToken(String token) {
		return Jwts.parser().setSigningKey(secret).parseClaimsJws(token).getB
	}

	//check if the token has expired
	private Boolean isTokenExpired(String token) {
		final Date expiration = getExpirationDateFromToken(token);
		return expiration.before(new Date());
	}

	//generate token for user
	public String generateToken(UserDetails userDetails) {
		Map<String, Object> claims = new HashMap<>();
		return doGenerateToken(claims, userDetails.getUsername());
	}
```

```
    //while creating the token -
    //1. Define  claims of the token, like Issuer, Expiration, Subject, and t
    //2. Sign the JWT using the HS512 algorithm and secret key.
    //3. According to JWS Compact Serialization(https://tools.ietf.org/html/d
    //   compaction of the JWT to a URL-safe string
    private String doGenerateToken(Map<String, Object> claims, String subject

        return Jwts.builder().setClaims(claims).setSubject(subject).setIssued
                .setExpiration(new Date(System.currentTimeMillis() + JWT_TOKE
                .signWith(SignatureAlgorithm.HS512, secret).compact();
    }

    //validate token
    public Boolean validateToken(String token, UserDetails userDetails) {
        final String username = getUsernameFromToken(token);
        return (username.equals(userDetails.getUsername()) && !isTokenExpired
    }


}
```

4) Create `JWTAuthenticationFilter` that extends`OncePerRequestFilter` and override method and write the logic to check the token that is comming in header. We have to write 5 important logic

Get Token from request
Validate Token
GetUsername from token
Load user associated with this token
set authentication

```
@Component
public class JwtAuthenticationFilter extends OncePerRequestFilter {

    private Logger logger = LoggerFactory.getLogger(OncePerRequestFilter.clas
    @Autowired
    private JwtHelper jwtHelper;


    @Autowired
    private UserDetailsService userDetailsService;
```

```
    @Override
    protected void doFilterInternal(HttpServletRequest request, HttpServletRe

//      try {
//          Thread.sleep(500);
//      } catch (InterruptedException e) {
//          throw new RuntimeException(e);
//      }
            //Authorization

            String requestHeader = request.getHeader("Authorization");
            //Bearer 2352345235sdfrsfgsdfsdf
        logger.info(" Header :  {}", requestHeader);
            String username = null;
            String token = null;
            if (requestHeader != null && requestHeader.startsWith("Bearer")) {
                //looking good
          token = requestHeader.substring(7);
                try {

            username = this.jwtHelper.getUsernameFromToken(token);

                } catch (IllegalArgumentException e) {
            logger.info("Illegal Argument while fetching the username !!"
            e.printStackTrace();
                } catch (ExpiredJwtException e) {
            logger.info("Given jwt token is expired !!");
            e.printStackTrace();
                } catch (MalformedJwtException e) {
            logger.info("Some changed has done in token !! Invalid Token"
            e.printStackTrace();
                } catch (Exception e) {
            e.printStackTrace();

                }


            } else {
          logger.info("Invalid Header Value !! ");
            }


            //
```

```
            if (username != null && SecurityContextHolder.getContext().getAuthent

                    .

                //fetch user detail from username
                UserDetails userDetails = this.userDetailsService.loadUserByUsern
                Boolean validateToken = this.jwtHelper.validateToken(token, userD
                if (validateToken) {

                    //set the authentication
                    UsernamePasswordAuthenticationToken authentication = new User
            authentication.setDetails(new WebAuthenticationDetailsSource(
                    SecurityContextHolder.getContext().setAuthentication(authenti


                } else {
            logger.info("Validation fails !!");
                }


            }

        filterChain.doFilter(request, response);


        }
}
```

5) Configure spring security in configuration

```
@Configuration
public class SecurityConfig {


    @Autowired
    private JwtAuthenticationEntryPoint point;
    @Autowired
    private JwtAuthenticationFilter filter;

    @Bean
    public SecurityFilterChain securityFilterChain(HttpSecurity http) throws

    http.csrf(csrf -> csrf.disable())
                    .authorizeRequests().
```

```
                    requestMatchers("/test").authenticated().requestMatchers("/au
                    .anyRequest()
                    .authenticated()
                    .and().exceptionHandling(ex -> ex.authenticationEntryPoint(po
                    .sessionManagement(session -> session.sessionCreationPolicy(S
        http.addFilterBefore(filter, UsernamePasswordAuthenticationFilter.cla
            return http.build();
        }


    }
```

6) Create JWTRequest and JWTResponse to receive request data and send Login success response.

7) Create login api to accept username and password and return token if username and password is correct.

```
@RestController
@RequestMapping("/auth")
public class AuthController {

    @Autowired
    private UserDetailsService userDetailsService;

    @Autowired
    private AuthenticationManager manager;


    @Autowired
    private JwtHelper helper;

    private Logger logger = LoggerFactory.getLogger(AuthController.class);


    @PostMapping("/login")
    public ResponseEntity<JwtResponse> login(@RequestBody JwtRequest request)

        this.doAuthenticate(request.getEmail(), request.getPassword());


        UserDetails userDetails = userDetailsService.loadUserByUsername(reque
        String token = this.helper.generateToken(userDetails);
```

```
        JwtResponse response = JwtResponse.builder()
                        .jwtToken(token)
                        .username(userDetails.getUsername()).build();
        return new ResponseEntity<>(response, HttpStatus.OK);
    }

    private void doAuthenticate(String email, String password) {

        UsernamePasswordAuthenticationToken authentication = new UsernamePass
        try {
       manager.authenticate(authentication);


        } catch (BadCredentialsException e) {
              throw new BadCredentialsException(" Invalid Username or Password
        }

    }

    @ExceptionHandler(BadCredentialsException.class)
    public String exceptionHandler() {
        return "Credentials Invalid !!";
    }

}
```