MET02-J. Do not use deprecated or obsolete classes or methods

Never use deprecated fields, methods, or classes in new code. Java provides an `@deprecated` annotation to indicate the deprecation of specific fields, methods, and classes. For example, many methods of `java.util.Date`, such as `Date.getYear()`, have been explicitly deprecated. THI05-J. Do not use Thread.stop() to terminate threads describes issues that can result from using the deprecated `Thread.stop()` method.

The Java SE documentation provides a list of deprecated APIs for each version of the language:

- Java SE 6
- Java SE 7
- Java SE 8

Programmers should use the list of deprecated functions specific to the language version they are using, although it may also be possible to avoid the use of APIs that are deprecated in later versions as well if suitable alternatives are available.

Obsolete fields, methods, and classes should not be used. Java lacks any annotation that indicates obsolescence; nevertheless, several classes and methods are documented as obsolete. For instance, the `java.util.Dictionary<K,V>` class is marked as obsolete; new code should use `java.util.Map<K,V>` instead [API 2014].

Obsolete Methods and Classes

The methods and classes listed in the following table must not be used:

Class or Method	Replacement	Rule
`java.lang.Character.isJavaLetter()`	`java.lang.Character.isJavaIdentifierStart()`	
`java.lang.Character.isJavaLetterOrDigit()`	`java.lang.Character.isJavaIdentifierPart()`	
`java.lang.Character.isSpace()`	`java.lang.Character.isWhitespace()`	
`java.lang.Class.newInstance()`	`java.lang.reflect.Constructor.newInstance()`	ERR06-J. Do not throw undeclared checked exceptions
`java.util.Date` (many methods)	`java.util.Calendar`	
`java.util.Dictionary<K,V>`	`java.util.Map<K,V>`	
`java.util.Properties.save()`	`java.util.Properties.store()`	
`java.lang.Thread.run()`	`java.lang.Thread.start()`	THI00-J. Do not invoke Thread.run()
`java.lang.Thread.stop()`	`java.lang.Thread.interrupt()`	THI05-J. Do not use Thread.stop() to terminate threads
`java.lang.ThreadGroup` (many methods)	`java.util.concurrent.Executor`	THI01-J. Do not invoke ThreadGroup methods
java.util.Date	java.time (since Java 8)	

The Java Virtual Machine Profiler Interface (JVMPI) and JVM Debug Interface (JVMDI) are also deprecated and have been replaced by the JVM Tool Interface (JVMTI) (see ENV05-J. Do not deploy an application that can be remotely monitored for more information).

Risk Assessment

Using deprecated or obsolete classes or methods in program code can lead to erroneous behavior.

Rule	Severity	Likelihood	Remediation Cost	Priority	Level
MET02-J	Low	Unlikely	Medium	**P2**	**L3**

Automated Detection

Detecting uses of deprecated methods is straightforward. Obsolete methods have no automatic means of detection.

Tool	Version	Checker	Description
Parasoft Jtest	10.3	**PB.API.DPRAPI, TRS.THRD**	Implemented

SonarQube	6.7	**S1874**	"@Deprecated" code should not be used

Related Guidelines

ISO/IEC TR 24772:2010	Deprecated Language Features [MEM]
MITRE CWE	CWE-589, Call to Non-ubiquitous API

Android Implementation Details

The Android SDK has deprecated and obsolete APIs. Also, there may exist incompatible APIs depending on the SDK version. Consequently, it is recommended that developers refer to the "Android API Differences Report" and consider replacing deprecated APIs.

Bibliography

[API 2014]	Deprecated API Interface `Map<K,V>`
[SDN 2008]	Bug database, Bug ID 4264153