In java to implement multiple inheritance we use interface. Is it the only use of interface? If yes what is the main use of interface in java? why we need interface in java?

9) I would say the main use is polymorphism, or the ability to perform the same operation on a number of different objects. If different objects all implement the same interface and have the same method, you can store all of those objects in a Vector, for example, and iterate through the Vector calling that method on each one.

2) You need them so you can type your objects outside the hierarchy.

For example, the objects that can be compared can be pretty much anywhere on the object hierarchy - they do not need to have a common ancestor which can be compared. Strings can be compared, Integers can be compared, you could even make your own Frames that could be compared (say, a frame is "less" than another frame if it is more in the foreground - i.e. if it would overlay the other frame). Thus, if you want to refer to a thing that can be compared, you would be forced to declare a variable with the most general ancestor - in this case, Object. This is too general, because then it can also receive values which are not comparable (and would throw errors when you try to compare them).

Thus, the interface Comparable: it selects all the classes that implement the comparison functionality across the subclass-superclass hierarchy.

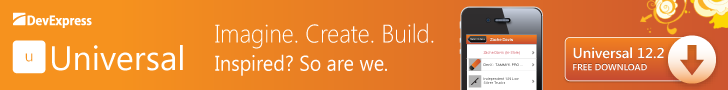
1. In addotion to these responses I would say the most important use for interfaces is to reduce coupling between components in your software.

An interface allows to represent an agreement between classes on how they will talk to each other without being tied to the actual implementations.

This allows us to replace implementations by others (very useful for testing!) without changing the compiled code.

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| 0down vote | Some code won't compile without it.  For example, in:  for (String name : list)  {  System.out.print("\nIn foreach loop: name: " + name);  }  list must implement the java.lang.Iterable interface. |

[**Why does Java need interfaces and Smalltalk does not?**](http://stackoverflow.com/questions/7972769/why-does-java-need-interfaces-and-smalltalk-does-not)

[](http://engine.adzerk.net/r?e=eyJhdiI6MTI4MTAsImF0Ijo0LCJjbSI6MjYwMDUsImNoIjoxMTc4LCJjciI6NjE2NTIsImRpIjoiMWY5ZDg0NzZiMmYyNDYzMGE2ODk3MjI5OGJiNWFmYzgiLCJkbSI6MSwiZmMiOjg3MzcxLCJmbCI6NDQwMjQsImt3IjoiamF2YSxpbnRlcmZhY2Usc21hbGx0YWxrIiwibnciOjIyLCJyZiI6Imh0dHA6Ly9zdGFja292ZXJmbG93LmNvbS9xdWVzdGlvbnMvMzUyODQyMC93aHktd2UtbmVlZC1pbnRlcmZhY2UtaW4tamF2YSIsInJ2IjowLCJwciI6MTU2Nywic3QiOjgyNzcsInpuIjo0MywidXIiOiJodHRwOi8vd3d3LmRldmV4cHJlc3MuY29tL2dvL1NPLURYUFUtMDIxMy5hc3B4In0&s=vJbF9ZdfGzYQ2JRfkIbyx1HYH7k)

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| up vote11down vote[favorite](http://stackoverflow.com/questions/7972769/why-does-java-need-interfaces-and-smalltalk-does-not?rq=1)  **1** | I have been programming in Smalltalk for some time, but I never really needed interfaces to implement anything. Then why can't languages such as Java get rid of interfaces? Is it only Smalltalk or is there another language which doesn't need interfaces?  [java](http://stackoverflow.com/questions/tagged/java) [interface](http://stackoverflow.com/questions/tagged/interface) [smalltalk](http://stackoverflow.com/questions/tagged/smalltalk" \o "show questions tagged 'smalltalk')   |  |  |  | | --- | --- | --- | | [share](http://stackoverflow.com/q/7972769)|[improve this question](http://stackoverflow.com/posts/7972769/edit) | [edited Nov 1 '11 at 21:08](http://stackoverflow.com/posts/7972769/revisions)  [[http://www.gravatar.com/avatar/efd91fa42413a9a32ec5a1d55157a848?s=32&d=identicon&r=PG](http://stackoverflow.com/users/387852/michael-mcgowan)](http://stackoverflow.com/users/387852/michael-mcgowan)  [Michael McGowan](http://stackoverflow.com/users/387852/michael-mcgowan) **3,117**11145 | asked Nov 1 '11 at 20:55  [[http://www.gravatar.com/avatar/4e8d491b25ac2c7de99e85ed57bfabd7?s=32&d=identicon&r=PG](http://stackoverflow.com/users/869097/user869097)](http://stackoverflow.com/users/869097/user869097)  [user869097](http://stackoverflow.com/users/869097/user869097) **504**17 | |
|  | |  |  |  |  | | --- | --- | --- | --- | | |  |  | | --- | --- | | **10** |  | | Who says that Java **needs** interfaces? It certainly *has* interfaces, but you *can* write interface-free Java code.– [Matt Ball](http://stackoverflow.com/users/139010/matt-ball) [Nov 1 '11 at 20:57](http://stackoverflow.com/questions/7972769/why-does-java-need-interfaces-and-smalltalk-does-not?rq=1#comment9749289_7972769) | |  | Not sure about small talk but Java uses interfaces because there is no multiple inheritance, but u can implement many interfaces – [Daniel](http://stackoverflow.com/users/123914/daniel) [Nov 1 '11 at 20:58](http://stackoverflow.com/questions/7972769/why-does-java-need-interfaces-and-smalltalk-does-not?rq=1#comment9749314_7972769) | |  | Scala is a jvm-based language which uses traits instead of interfaces. Traits are like abstract classes, but with a few limitations, to allow for multiple inheritance. They are all good: [scala-lang.org/node/126](http://www.scala-lang.org/node/126) – [am75](http://stackoverflow.com/users/303698/am75) [Nov 1 '11 at 21:04](http://stackoverflow.com/questions/7972769/why-does-java-need-interfaces-and-smalltalk-does-not?rq=1#comment9749405_7972769) | | |  |  | | --- | --- | | **1** |  | | @user869097: *(static typing concerns aside)* another question which you could find worth asking: is there another language which **forces** you to use the equivalent of Java interfaces? Any OOA/OOD (including those using multiple inheritance) can be modeled in Java using only interfaces. Then it is actually possible to write Java program where *every single class* is marked as *final* and where there isn't a single *abstract*class (prefer composition over inheritance and all that). I'm not saying you *should* do that. I'm just saying you *could* and that is food for thought : ) – [TacticalCoder](http://stackoverflow.com/users/988052/tacticalcoder" \o "3453 reputation) [Nov 1 '11 at 21:19](http://stackoverflow.com/questions/7972769/why-does-java-need-interfaces-and-smalltalk-does-not?rq=1#comment9749650_7972769) | | |  |  | | --- | --- | | **1** |  | | @user988052: In case you're interested, this page specifically goes into detail about the type system:[bracha.org/nwst.html](http://bracha.org/nwst.html) (Strongtalk uses the term "protocol" to refer to its message-based types, as is customary in Smalltalky circles, but it's very closely equivalent to an interface) – [Chuck](http://stackoverflow.com/users/50742/chuck) [Nov 2 '11 at 0:04](http://stackoverflow.com/questions/7972769/why-does-java-need-interfaces-and-smalltalk-does-not?rq=1#comment9751621_7972769) |   show **3** more comments |

**4 Answers**

[active](http://stackoverflow.com/questions/7972769/why-does-java-need-interfaces-and-smalltalk-does-not?answertab=active#tab-top)[oldest](http://stackoverflow.com/questions/7972769/why-does-java-need-interfaces-and-smalltalk-does-not?answertab=oldest#tab-top)[votes](http://stackoverflow.com/questions/7972769/why-does-java-need-interfaces-and-smalltalk-does-not?answertab=votes#tab-top)

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| up vote18down voteaccepted | Because Java is statically typed while Smalltalk is not. Interfaces don't serve any purpose when you don't declare types and your variables aren't going to be typechecked. But in a statically typed language like Java, they're extremely handy, because they let you have a variable whose type is defined by the methods the object implements instead of its class. It brings you a lot closer to the dynamic typing Smalltalk has natively without giving up the benefits of typechecking.   |  |  | | --- | --- | | [share](http://stackoverflow.com/a/7972832)|[improve this answer](http://stackoverflow.com/posts/7972832/edit) | answered Nov 1 '11 at 20:59  [[http://www.gravatar.com/avatar/03cdad7329f1a13d2b2f3d9c8a08813d?s=32&d=identicon&r=PG](http://stackoverflow.com/users/50742/chuck)](http://stackoverflow.com/users/50742/chuck)  [Chuck](http://stackoverflow.com/users/50742/chuck) **106k**9130235 | |
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[](http://engine.adzerk.net/r?e=eyJhdiI6NDE0LCJhdCI6NCwiY20iOjg0NywiY2giOjExNzgsImNyIjo1OTIxLCJkaSI6ImI3M2Y5MDExOTk0MzQ5NmU5ZjBhZDY5YmVjN2EwM2Q2IiwiZG0iOjEsImZjIjo4ODA3LCJmbCI6MjQ0NCwia3ciOiJqYXZhLGludGVyZmFjZSxzbWFsbHRhbGsiLCJudyI6MjIsInJmIjoiaHR0cDovL3N0YWNrb3ZlcmZsb3cuY29tL3F1ZXN0aW9ucy8zNTI4NDIwL3doeS13ZS1uZWVkLWludGVyZmFjZS1pbi1qYXZhIiwicnYiOjAsInByIjoxNTY4LCJzdCI6ODI3Nywiem4iOjQ0LCJ1ciI6Imh0dHA6Ly9jYXJlZXJzLnN0YWNrb3ZlcmZsb3cuY29tLyJ9&s=HuF-hNXRcDLOuVk6VZ_u_91JaYs)

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| up vote6down vote | It is a polymorphism issue: in Java you have static types and therefore you need to know which messages can your object answer... in Smalltalk (and other non-static languages) you just need to implement right methods to have polymorphism.  For instance:   * In Java you need to implement Cloneable, who defines method Cloneable.clone to have cloneble objects. Then, the compiler knows your object will understand that method (otherwise it will throw an error) * In smalltalk, you just need to implement method #clone. Compiler never knows/don't care about which messages understands your objects until it is called.   That also means you can have polymorphic objects without being part of same hierarchy... multi inheritance, mixins and other approachs (traits are present on Pharo) are just reuse technics, not a design constraint.  This way of do things is often called "duck typing"... see: <http://en.wikipedia.org/wiki/Duck_typing>   |  |  | | --- | --- | | [share](http://stackoverflow.com/a/7979852)|[improve this answer](http://stackoverflow.com/posts/7979852/edit) | answered Nov 2 '11 at 11:52  [[http://www.gravatar.com/avatar/193af464509ae8fbcc04abad70b72fc0?s=32&d=identicon&r=PG](http://stackoverflow.com/users/579019/estebanlm)](http://stackoverflow.com/users/579019/estebanlm)  [EstebanLM](http://stackoverflow.com/users/579019/estebanlm) **675**23 | |
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| up vote1down vote | Do you think there might be a useful role for "interfaces" in Smalltalk?  See - [Adding Dynamic Interfaces to Smalltalk](http://www.jot.fm/issues/issue_2002_05/article1/)   |  |  | | --- | --- | | [share](http://stackoverflow.com/a/7998079)|[improve this answer](http://stackoverflow.com/posts/7998079/edit) | answered Nov 3 '11 at 16:06  [[http://www.gravatar.com/avatar/f79a7909dfca0088f4fdc01f109f497e?s=32&d=identicon&r=PG](http://stackoverflow.com/users/63471/igouy)](http://stackoverflow.com/users/63471/igouy)  [igouy](http://stackoverflow.com/users/63471/igouy) **1,546**47 | |
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| up vote0down vote | not sure what exactly your asking (or rather, which question you most want answered) but have a look at Ruby. From my understanding it's much closer to smalltalk than Java is.  If i were to answer the question about why java needs interfaces, I guess I'd say something about java being a statically typed language and taking that philosophy to the extent that java does is what makes for the need of interfaces. Effectively interfaces try to give you something like multiple inheritence in java without the multiple inheritance issues that other languages face (C++ i believe).   |  | | --- | | [share](http://stackoverflow.com/a/7972822)|[improve this answer](http://stackoverflow.com/posts/7972822/edit) | |