



[Scala 3 Reference](#) / [Other Changed Features](#) / [Wildcard Arguments in Types](#)

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Wildcard Arguments in Types

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The syntax of wildcard arguments in types has changed from `_` to `?`. Example:

```
List[?]
Map[? <: AnyRef, ? >: Null]
```

Motivation

We would like to use the underscore syntax `_` to stand for an anonymous type parameter, aligning it with its meaning in value parameter lists. So, just as `f(_)` is a shorthand for the lambda `x ⇒ f(x)`, in the future `c[_]` will be a shorthand for the type lambda `[X] ⇒ c[X]`. This makes higher-kinded types easier to use. It also removes the wart that, used as a type parameter, `F[_]` means `F` is a type constructor whereas used as a type, `F[_]` means it is a wildcard (i.e. existential) type. In the future, `F[_]` will mean the same thing, no matter where it is used.

We pick `?` as a replacement syntax for wildcard types, since it aligns with [Java's syntax](#).

Migration Strategy

The migration to the new scheme is complicated, in particular since the [kind projector](#) compiler plugin still uses the reverse convention, with `?` meaning parameter placeholder instead of wildcard. Fortunately, kind projector has added `*` as an alternative syntax for `?`.

A step-by-step migration is made possible with the following measures:

1. In Scala 3.0, both `_` and `?` are legal names for wildcards.
2. In Scala 3.1, `_` is deprecated in favor of `?` as a name for a wildcard. A `-rewrite` option is available to rewrite one to the other.
3. In Scala 3.2, the meaning of `_` changes from wildcard to placeholder for type

parameter.



4. The Scala 3.1 behavior is already available today under the `-source future` setting.

To smooth the transition for codebases that use kind-projector, we adopt the following measures under the command line option `-Ykind-projector` :

1. In Scala 3.0, `*` is available as a type parameter placeholder.
2. In Scala 3.2, `*` is deprecated in favor of `_`. A `-rewrite` option is available to rewrite one to the other.
3. In Scala 3.3, `*` is removed again, and all type parameter placeholders will be expressed with `_`.

These rules make it possible to cross build between Scala 2 using the kind projector plugin and Scala 3.0 - 3.2 using the compiler option `-Ykind-projector` .

There is also a migration path for users that want a one-time transition to syntax with `_` as a type parameter placeholder. With option `-Ykind-projector:underscores` Scala 3 will regard `_` as a type parameter placeholder, leaving `?` as the only syntax for wildcards.

To cross-compile with old Scala 2 sources, while using `_` a placeholder, you must use options `-Xsource:3 -P:kind-projector:underscore-placeholders` together with a recent version of kind-projector (`0.13` and higher) and most recent versions of Scala 2 (`2.13.5` and higher and `2.12.14` and higher)

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Imports >