software studio

namespaces & variables

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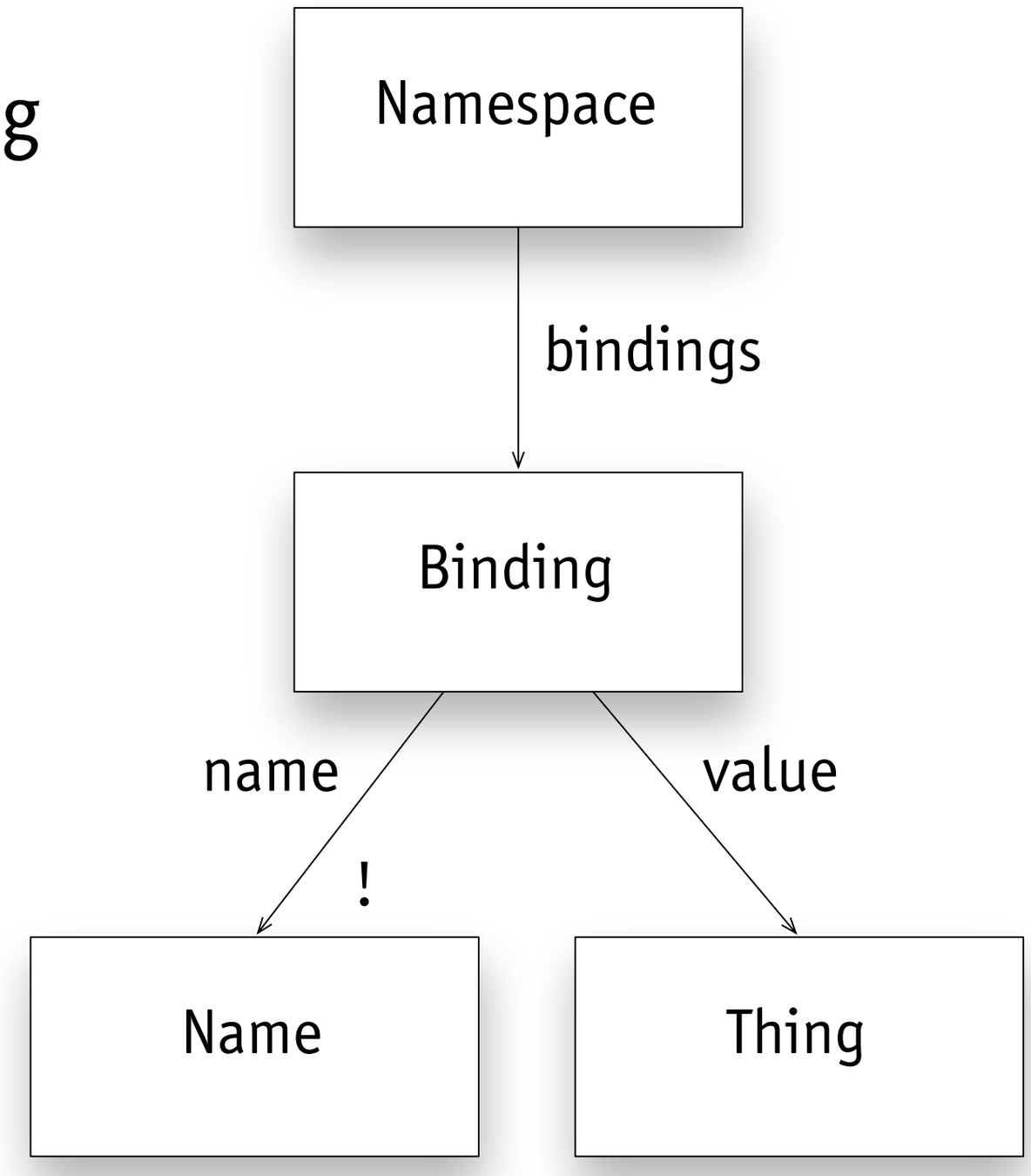
namespaces

context matters

› same name, different meaning

applications of this idea

› program elements
› state components
› files & directories
› URLs & routing
› …



environments

environment

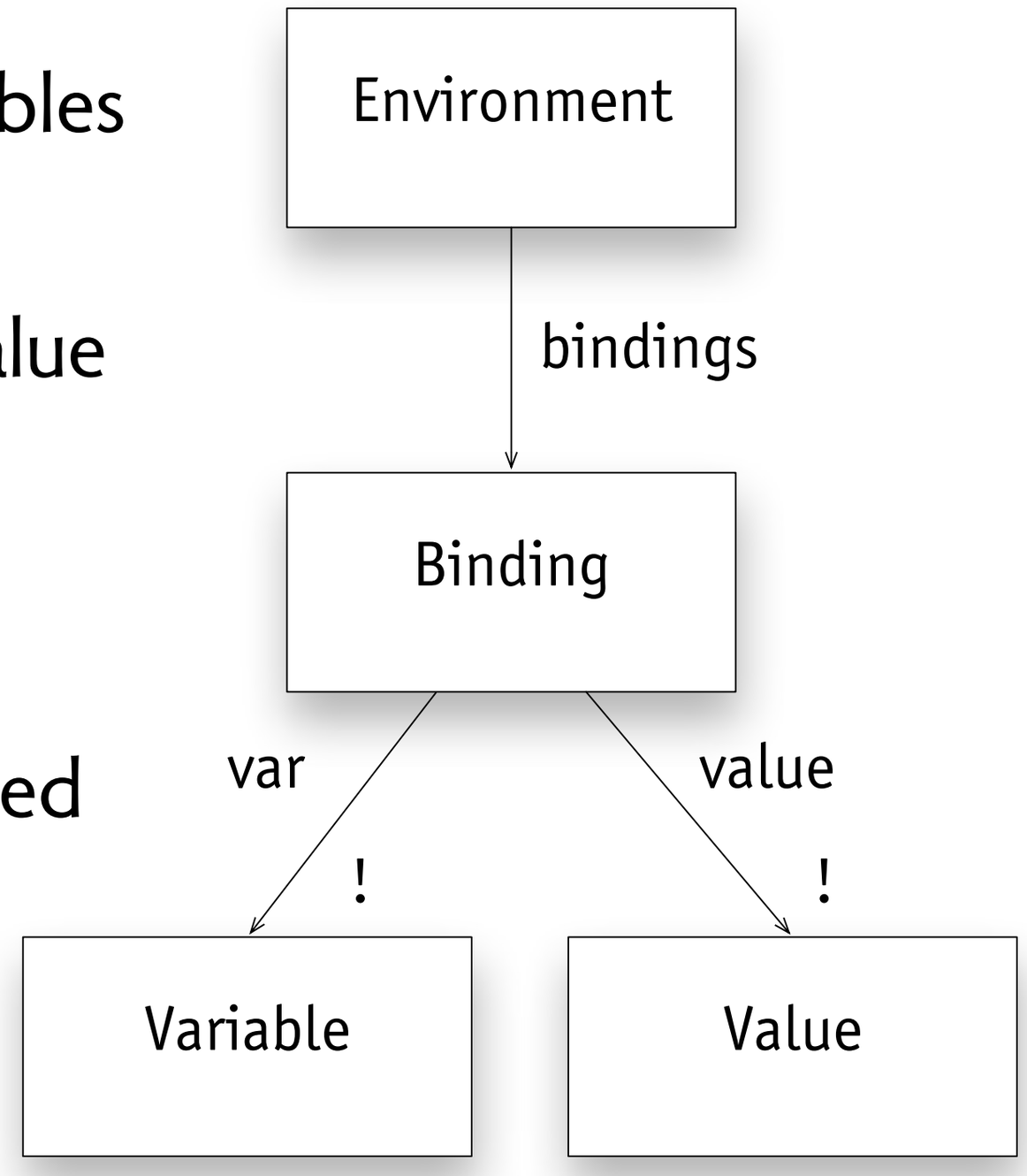
› namespace for program variables

in Javascript

› every bound variable has a value
› value may be “undefined”

confusing

› unbound var gives ref error
› property can only be undefined
› undefined is a value!



lookup

to evaluate an expression

› lookup value of each var

› apply functions to arguments

how to lookup

› just find the binding for the var

```
> h = "hello there"
"hello there"
> escape
function escape()
{ [native code] }
> escape(h)
"hello%20there"
```

assignment

assignment statement

› x = e, read “x gets e”

semantics

› evaluate e to value v

› if x is bound, replace value with v

› else create new binding of x to v

in JS, all names are vars

› a function name is just a var, can reassign

› more on this when we see recursion

contrast to Java

› variables just one kind of name

› other kinds of name: methods, classes, packages

```
> h = "hello there"
"hello there"
> escape(h)
"hello%20there"
> escape = function()
{return "gone!";}
function () {return
"gone!";}
> escape(h)
"gone!"
```

aliasing

after the assignment x = y

› x is bound to same value as y

how sharing arises

› no implicit copying

› so x and y are names for same object

consequence

› change to "one" affects the "other"

if object is immutable

› no change to object possible

› so as if value is copied

```
> y = []
[]
> x = y
[]
> x.f = 1
1
> y.f
1
```

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