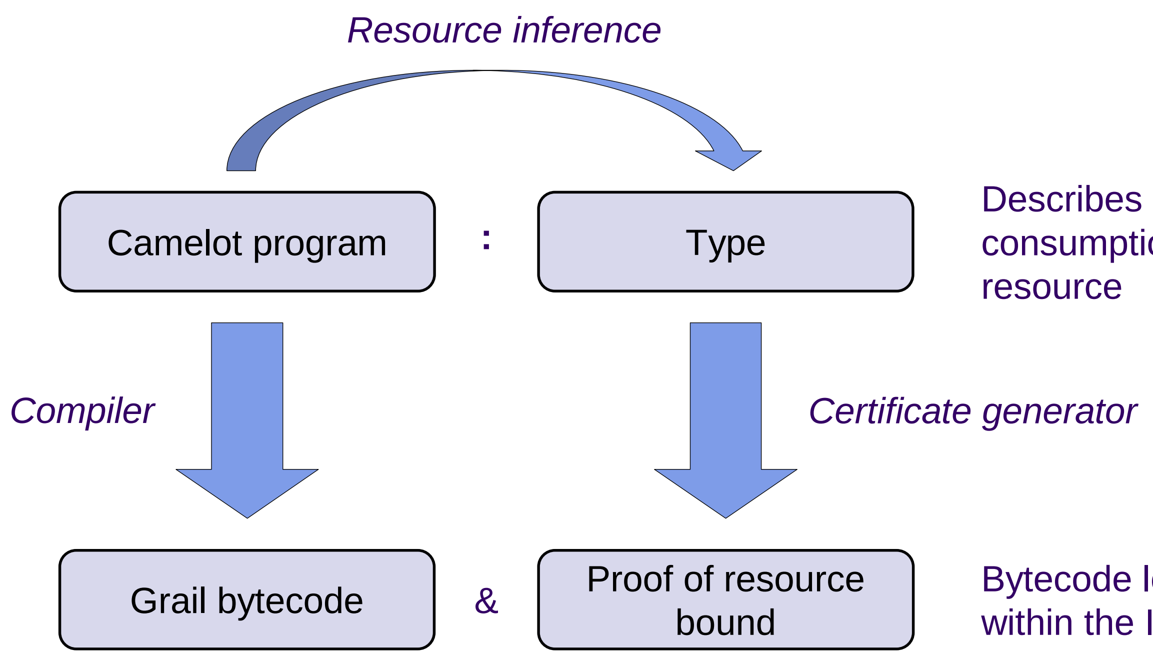
MRG – Mobile Resource Guarantees

www.lfcs.ed.ac.uk/mrg

System Overview



High level functional programming language

Describes bounds for space consumption and other kinds of resource

Low level bytecode executes on the Java Virtual Machine

Bytecode logic of resources within the Isabelle theorem prover

Project IST-2001-33149 funded by the Global Computing proactive initiative in the Future and Emerging Technologies arm of the IST Programme

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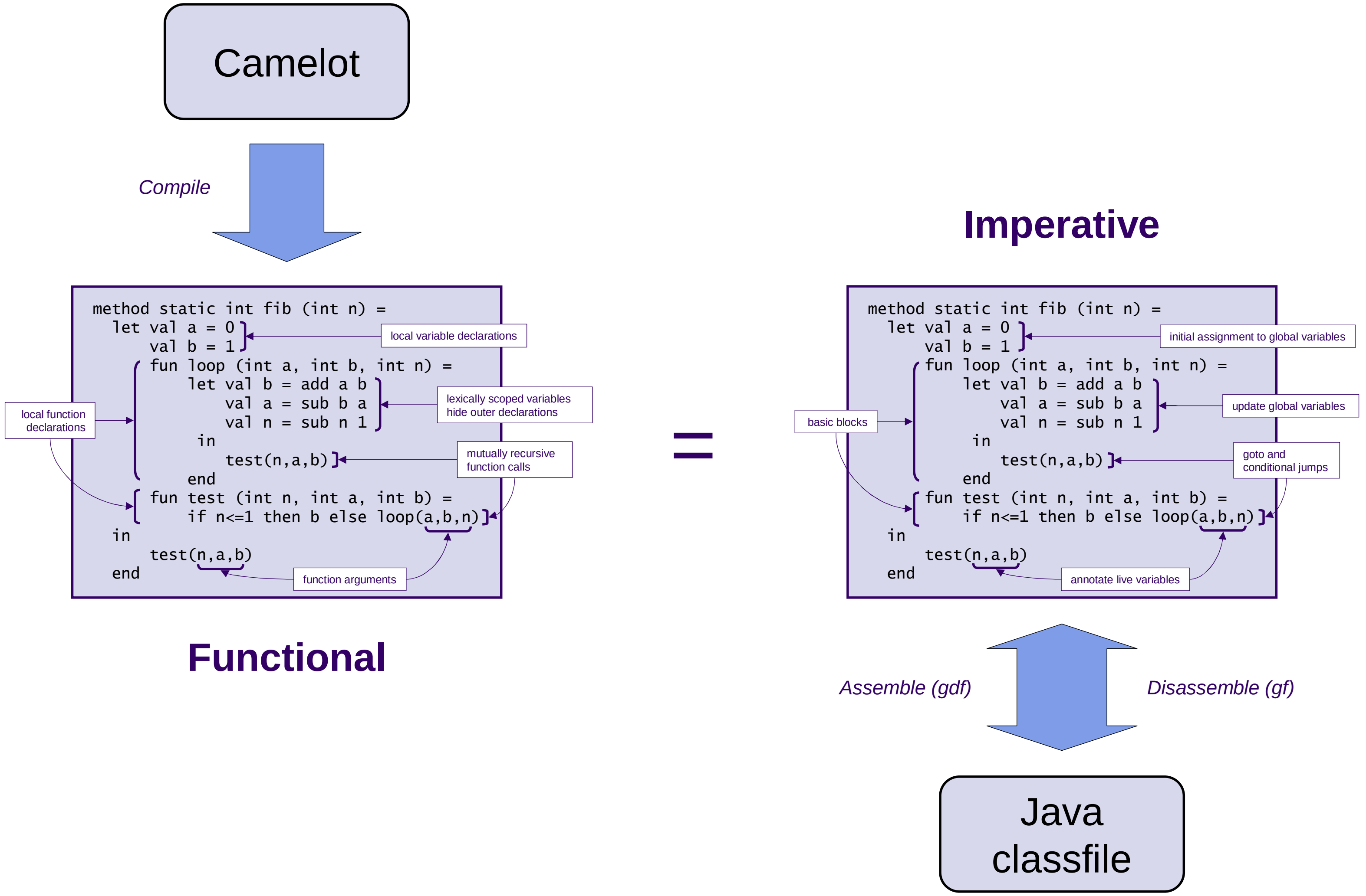
GRAIL

Guaranteed
Resource
Allocation
Intermediate
Language



Camelot
Compile
Functional
=
Imperative
Assemble (gdf)
Disassemble (gf)
Java classfile
local variable declarations
local function declarations
lexically scoped variables hide outer declarations
mutually recursive function calls
function arguments
initial assignment to global variables
basic blocks
update global variables
goto and conditional jumps
annotate live variables

```
method static int fib (int n) =
  let val a = 0
      val b = 1
      fun loop (int a, int b, int n) =
          let val b = add a b
              val a = sub b a
              val n = sub n 1
           in
              test(n,a,b)
          end
      fun test (int n, int a, int b) =
          if n<=1 then b else loop(a,b,n)
  in
      test(n,a,b)
  end
```

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method static int fib (int n) =
  let val a = 0
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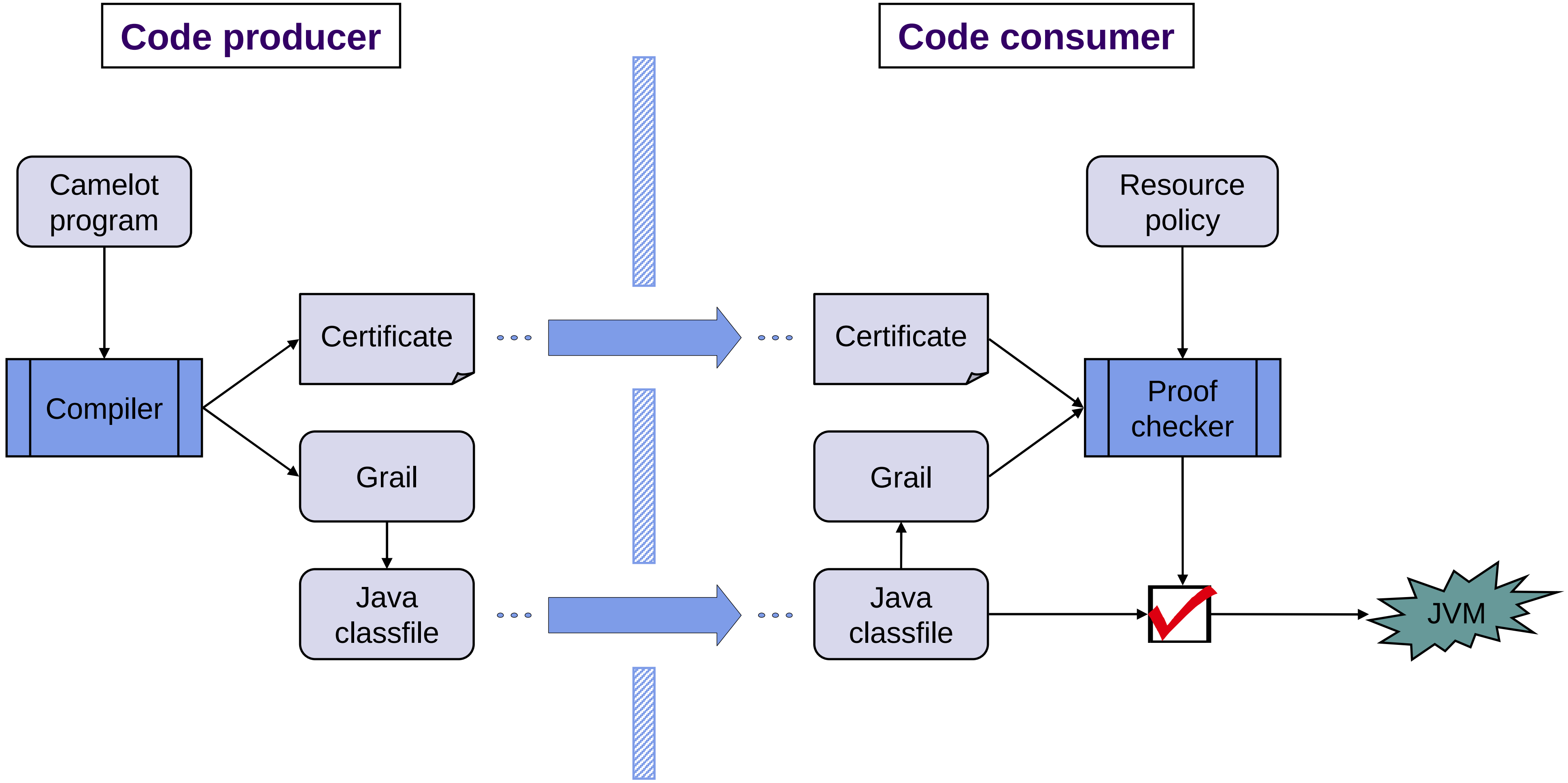
Proof-Carrying Code



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