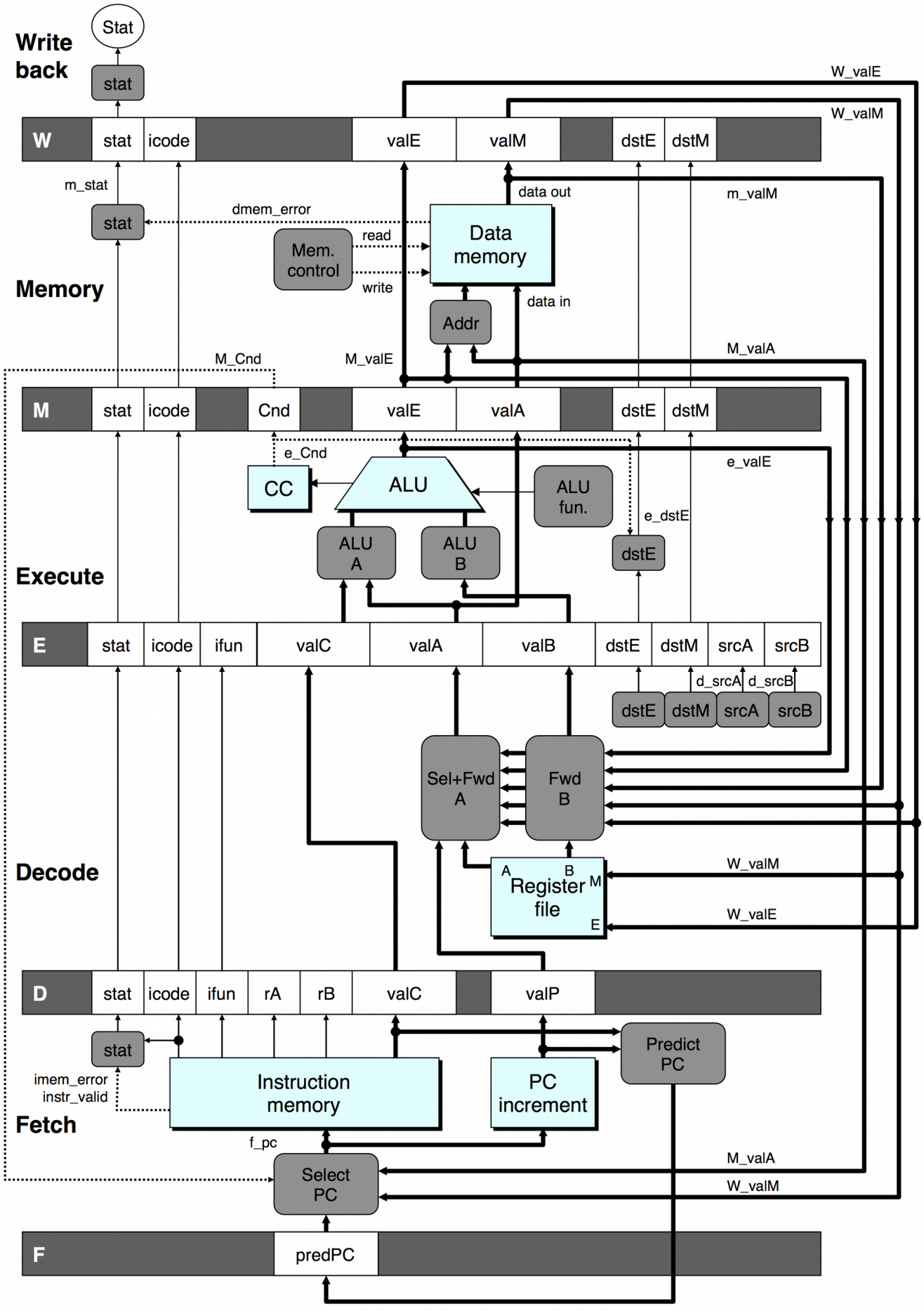
Write back
Stat
stat
W_valE
W_valM
W
stat
icode
valE
valM
dstE
dstM
m_stat
stat
dmem_error
data out
m_valM
Mem. control
read
write
Data memory
Memory
data in
Addr
M_valA
M_Cnd
M_valE
M
stat
icode
Cnd
valE
valA
dstE
dstM
e_Cnd
e_valE
CC
ALU
ALU fun.
e_dstE
ALU A
ALU B
dstE
Execute
E
stat
icode
ifun
valC
valA
valB
dstE
dstM
srcA
srcB
d_srcA
d_srcB
dstE
dstM
srcA
srcB
Sel+Fwd A
Fwd B
Decode
W_valM
A
B
Register file
M
E
W_valE
D
stat
icode
ifun
rA
rB
valC
valP
stat
Predict PC
imem_error
instr_valid
Instruction memory
PC increment
Fetch
f_pc
M_valA
Select PC
W_valM
F
predPC

Arithmetic instructions:

addq → fn = 0 subq → fn = 1 mulq → fn = 4 modq → fn = 6

andq → fn = 2 xorq → fn = 3 divq → fn = 5

Conditional jumps and moves:

jmp fn = 0 jle → fn = 1 jl fn = 2 je → fn = 3

jne fn = 4 jge → fn = 5 jg fn = 6

rrmovq fn = 0 cmovle → fn = 1 cmovl fn = 2 cmove → fn = 3

cmovne fn = 4 cmovge → fn = 5 cmovg fn = 6

Register Numbering (in hex)

0 %rax 1 %rcx 2 %rdx 3 %rbx 4 %rsp 5 %rbp 6 %rsi 7 %rdi

8 %r8 9 %r9 A %r10 B %r11 C %r12 D%r13 E %r14

F No register