Appendix: *winMIPS64 Instruction Set*

WinMIPS64

The following assembler directives are supported

.data - start of data segment
.text - start of code segment
.code - start of code segment (same as .text)
.org <n> - start address
.space <n> - leave n empty bytes
.asciiz <s> - enters zero terminated ascii string
.ascii <s> - enter ascii string
.align <n> - align to n-byte boundary
.word <n1>,<n2>.. - enters word(s) of data (64-bits)
.byte <n1>,<n2>.. - enter bytes
.word32 <n1>,<n2>.. - enters 32 bit number(s)
.word16 <n1>,<n2>.. - enters 16 bit number(s)
.double <n1>,<n2>.. - enters floating-point number(s)

where <n> denotes a number like 24, <s> denotes a string like "fred", and
<n1>,<n2>.. denotes numbers seperated by commas.

The following instructions are supported

lb - load byte
lbu - load byte unsigned
sb - store byte
lh - load 16-bit half-word
lhu - load 16-bit half word unsigned
sh - store 16-bit half-word
lw - load 32-bit word
lwu - load 32-bit word unsigned
sw - store 32-bit word
ld - load 64-bit double-word
sd - store 64-bit double-word
l.d - load 64-bit floating-point
s.d - store 64-bit floating-point
halt - stops the program

daddi - add immediate
daddui - add immediate unsigned
andi - logical and immediate
ori - logical or immediate
xori - exclusive or immediate
lui - load upper half of register immediate
slti - set if less than or equal immediate
sltiu - set if less than or equal immediate unsigned

beq - branch if pair of registers are equal
bne - branch if pair of registers are not equal
beqz - branch if register is equal to zero
bnez - branch if register is not equal to zero

j - jump to address
jr - jump to address in register
jal - jump and link to address (call subroutine)
jalr - jump and link to address in register (call subroutine)

dsll - shift left logical
dsrl - shift right logical
dsra - shift right arithmetic
dsllv - shift left logical by variable amount
dsrlv - shift right logical by variable amount
dsrav - shift right arithmetic by variable amount
movz - move if register equals zero
movn - move if register not equal to zero
nop - no operation
and - logical and
or - logical or
xor - logical xor
slt - set if less than
sltu - set if less than unsigned
dadd - add integers
daddu - add integers unsigned
dsub - subtract integers
dsubu - subtract integers unsigned

add.d - add floating-point
sub.d - subtract floating-point
mul.d - multiply floating-point
div.d - divide floating-point
mov.d - move floating-point
cvt.d.l - convert 64-bit integer to a double FP format
cvt.l.d - convert double FP to a 64-bit integer format
c.lt.d - set FP flag if less than
c.le.d - set FP flag if less than or equal to
c.eq.d - set FP flag if equal to
bc1f - branch to address if FP flag is FALSE
bc1t - branch to address if FP flag is TRUE
mtc1 - move data from integer register to FP register
mfc1 - move data from FP register to integer register