

Outline

- Introduction
- Architecture of a RISC Processor
- Implementation



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Instruction Set

- Computation instructions
- Memory access instructions
- Control instructions
- System instructions



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Architecture

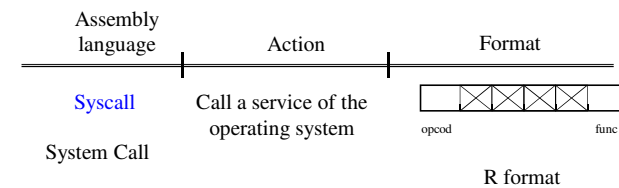
- Software visible registers
- Memory Addressing
- The instruction set
- The exception / reset mechanism



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System Instructions



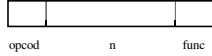
Stop executing the current program and jump to the Exception Handler




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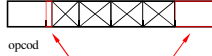
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System Instructions

Assembly language	Action	Format
Break n Break	Call the debugger through the operating system	 <p style="text-align: center;">R format</p>
Stop executing the current program and jump to the Exception Handler		

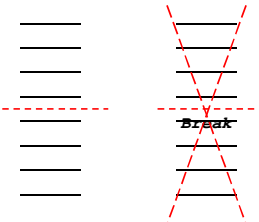

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System Instructions

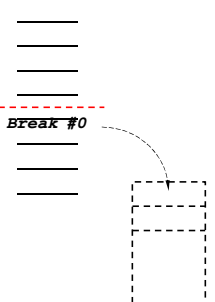
Assembly language	Action	Format
Eret Exception return	Return from exception Restore Status Register and jump to the interrupted program	 <p style="text-align: center;">I* format</p>
Exc if executed under User mode		


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System Instructions




Break



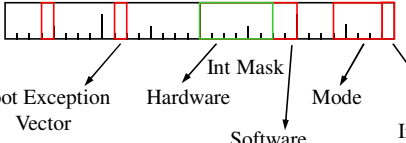
Break #0

All the branch offsets should be recalculated



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System Instructions

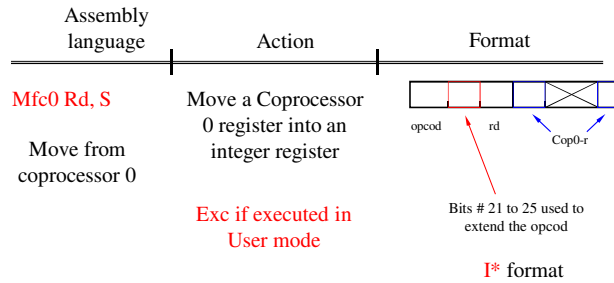
● Status Register



If **xx 1x** => **xx 0x**
 else => **xx 00**


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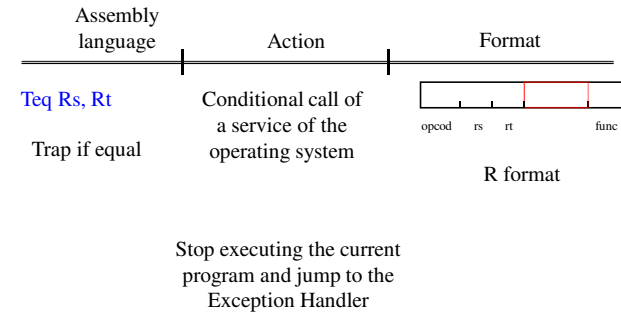
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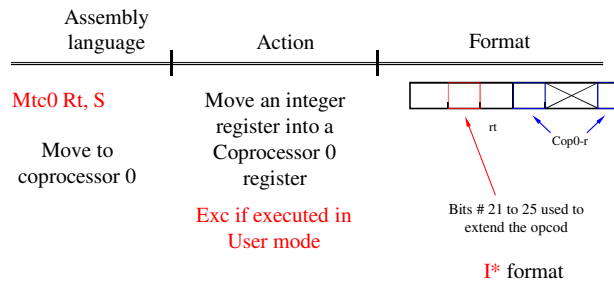
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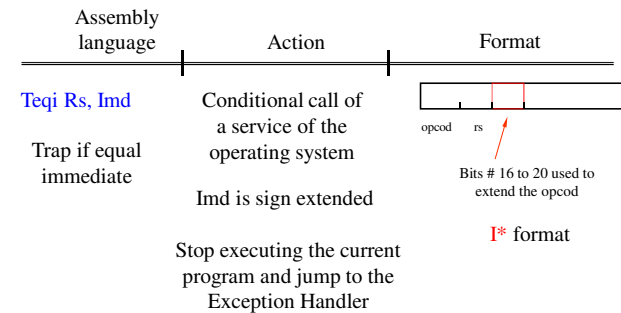
System Instructions



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System Instructions



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System Instructions


Assembly language	Action	Format
Tne Rs, Rt Trap if not equal	Conditional call of a service of the operating system	 <p>R format</p>
<p>Stop executing the current program and jump to the Exception Handler</p>		



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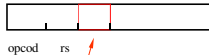
Assembly language	Action	Format
Tlt Rs, Rt Trap if less than	Conditional call of a service of the operating system	 <p>R format</p>
<p>Stop executing the current program and jump to the Exception Handler</p>		



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System Instructions


Assembly language	Action	Format
Tnei Rs, Imd Trap if not equal immediate	Conditional call of a service of the operating system Imd is sign extended	 <p>I* format</p>
<p>Stop executing the current program and jump to the Exception Handler</p>		



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System Instructions


Assembly language	Action	Format
Tlti Rs, Imd Trap if less than immediate	Conditional call of a service of the operating system Imd is sign extended	 <p>I* format</p>
<p>Stop executing the current program and jump to the Exception Handler</p>		



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System Instructions


Assembly language	Action	Format
Tltu Rs, Rt Trap if less than unsigned	Conditional call of a service of the operating system	 <p>R format</p>
<p>Stop executing the current program and jump to the Exception Handler</p>		



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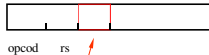
Assembly language	Action	Format
Tge Rs, Rt Trap if greater or equal	Conditional call of a service of the operating system	 <p>R format</p>
<p>Stop executing the current program and jump to the Exception Handler</p>		



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System Instructions


Assembly language	Action	Format
Tltiu Rs, Imd Trap if less than unsigned immediate	Conditional call of a service of the operating system Imd is sign extended	 <p>I* format</p>
<p>Stop executing the current program and jump to the Exception Handler</p>		



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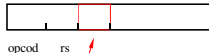
Assembly language	Action	Format
Tgeu Rs, Rt Trap if greater or equal unsigned	Conditional call of a service of the operating system	 <p>R format</p>
	Stop executing the current program and jump to the Exception Handler	



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System Instructions

Assembly language	Action	Format
Tgeiu Rs, Imd Trap if greater or equal immediate unsigned	Conditional call of a service of the operating system Imd is sign extended	 <p>Bits # 16 to 20 used to extend the opcode</p> <p>I* format</p>
	Stop executing the current program and jump to the Exception Handler	



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