

T-EMU: Machine Class Manual



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Record of Changes

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1. Introduction

The machine class is used to assemble and group related processors in machines. The machine class is intended to be used for SMP and multi-core systems. It provides the following capabilities:

1. A multi-CPU scheduler that executes all the CPUs in the machine in sequence (for a fixed time quanta).
2. A synchronised event queue. CPUs can post events in the next time quanta to be executed after all the processors have reached a specific time point.
3. A scheduling interface enabling the machine to be run for a time specified in seconds, not cycles.

Note that the machine class supports the scheduling of different CPUs with different clock frequencies.

Synchronised events are posted on a CPUs event queue by adding the flag `TEMU_EVENT_SYNC` to the posting function, this will bypass the CPU event queue and put it in the machine object's queue.

2. Attributes

2.1. Properties

Name	Type	Description
<code>cpus</code>	<code>irefarray</code>	Processors in the machine
<code>currentCPU</code>	<code>iref</code>	Current CPU
<code>currentCPUIdx</code>	<code>int32_t</code>	Current CPU Index
<code>devices</code>	<code>irefarray</code>	Devices to reset when machine is reset
<code>object.timeSource</code>	<code>object</code>	Time source object (a cpu or machine object)



Name	Type	Description
quanta	uint64_t	Quanta length in nanoseconds
quantaEnd	uint64_t	End point of current quanta in nanoseconds
quantaStart	uint64_t	Quanta start in nanoseconds
syncMask	uint64_t	Synchronised CPU mask

2.2. Interfaces

Name	Type	Description
EventIface	EventIface	
LegacyIface	LegacyIface	
MachineIface	MachineIface	
ObjectIface	ObjectIface	

2.3. Ports

Prop	Iface	Description
-	-	-

3. Limitations

- The machine class cannot have more than 64 CPU cores connected.