Deadlock, Part 1: Resource Allocation Graph

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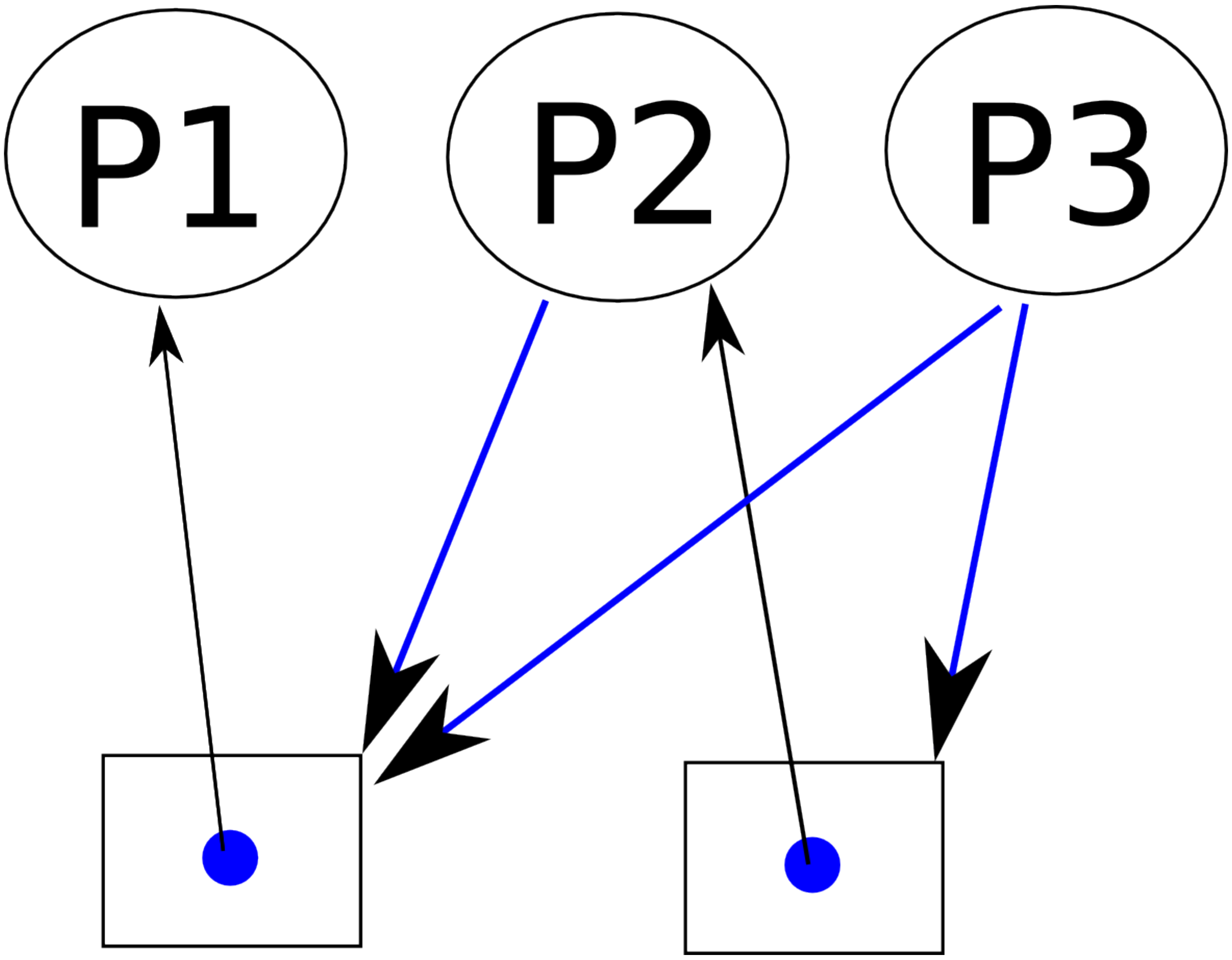
Alex Kizer edited this page on Mar 17 · 1 revision

What is a Resource Allocation Graph?

A resource allocation graph tracks which resource is held by which process and which process is waiting for a resource of a particular type. It is very powerful and simple tool to illustrate how interacting processes can deadlock. If a process is *using* a resource, an arrow is drawn from the resource node to the process node. If a process is *requesting* a resource, an arrow is drawn from the process node to the resource node.

If there is a cycle in the Resource Allocation Graph then the processes will deadlock. For example, if process 1 holds resource A, process 2 holds resource B and process 1 is waiting for B and process 2 is waiting for A, then process 1 and 2 process will be deadlocked.

Here's another example, that shows Processes 1 and 2 acquiring resources 1 and 2 while process 3 is waiting to acquire both resources. In this example there is no deadlock because there is no circular dependency.



Todo: More complicated example

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