

Example Evaluation

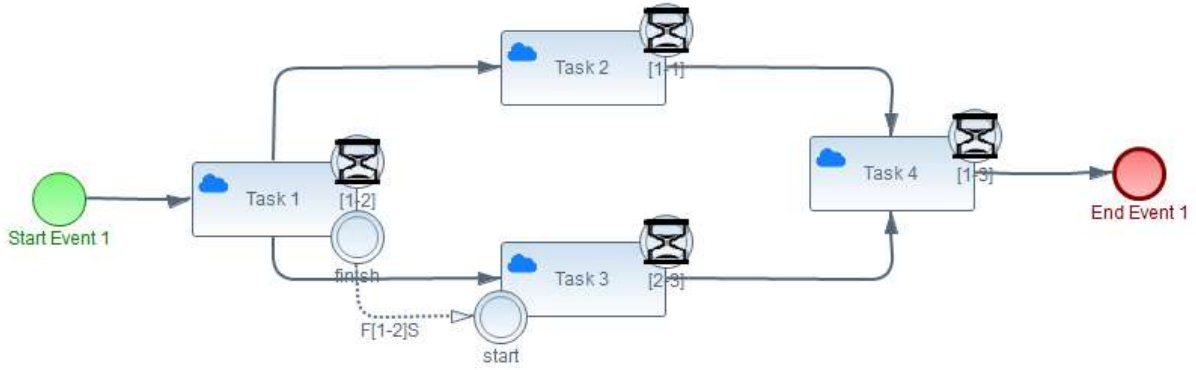


Figure 1. Process Model

Table 1. Activities Temporal Duration

Activities	Task1	Task2	Task3	Task4
Durations	[1h, 2h]	[1h, 1h]	[2h, 3h]	[1h, 3h]

The process is composed of 4 activities: Task1, Task2, Task3 and Task4. Each activity has a duration expressed in terms of minimum and maximum duration. For example, Task1 minimum duration is 1 hour and its maximum duration is 2 hours. Besides, a temporal dependency is specified between the end and start time of Task1 and Task3 expressed in terms on a time interval [1h, 2h]. Moreover, activities require virtual machines to be executed bought based on various pricing strategies:

- Task 1 uses R_1 (m4.xlarge) as a spot instance with non-predefined duration
- Task 2 and Task 4 share R_2 (r3.large) as a spot instance with predefined duration ([1h, 6h])
- Task 3 uses R_3 (m3.2xlarge) as an on-demand instance

Table 2 Virtual Machine Instance Properties by Pr_{i1} =Amazon EC2

VM	RAM	vCPU	On-demand c_{i11}	Reserved upfront) c_{i12}	(no	Spot pred dur c_{i13}	Spot non-pred dur c_{i14}
$R_1 =$ m4.xlarge	16 GB	4	0.215\$/h	0.147\$/h		0.129\$/h [0h, 1h]	0.0491\$/h [06pm, 01am ⁽⁺¹⁾]
						0.142\$/h [1h, 6h]	0.0386\$/h [01am, 06pm]
$R_2 =$ r3.large	15 GB	2	0.166\$/h	0.105\$/h		0.096\$/h [0h, 1h]	0.0225\$/h [03am, 10pm]
						0.102\$/h [1h, 6h]	0.0381\$/h [10pm, 03am ⁽⁺¹⁾]
$R_3 =$ m3.2xlarge	30 GB	8	0.532\$/h	0.380\$/h		0.293\$/h [0h, 1h]	0.0787\$/h [10am, 9pm]
						0.372\$/h [1h, 6h]	0.0863\$/h [09pm, 10am ⁽⁺¹⁾]

Notes: When there is a temporal dependency between two activities (say A1 and A2), the resource allocated to A2 will start running just when A2 starts its execution.