
COLONIES - COMPUTE CONTINUUMS ACROSS PLATFORMS

A PREPRINT

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ABSTRACT

This paper presents a novel framework for building

Keywords Serverless computing · Parallel computing · Workflow orchestration

1 Introduction

TODO

2 The Colonies framework

2.1 Architecture

TODO

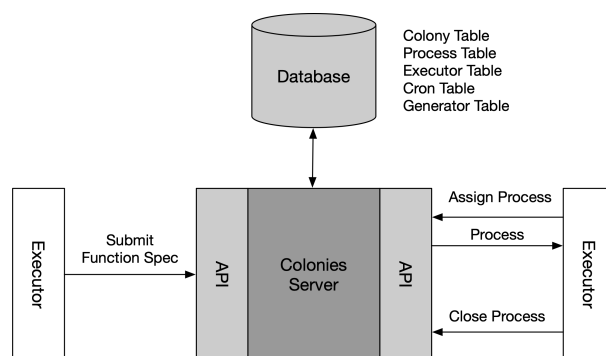


Figure 1: cron management

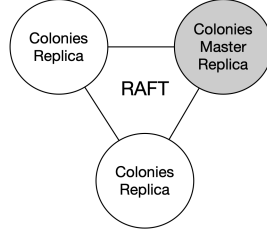


Figure 2: cron management

2.1.1 Workflows

TODO

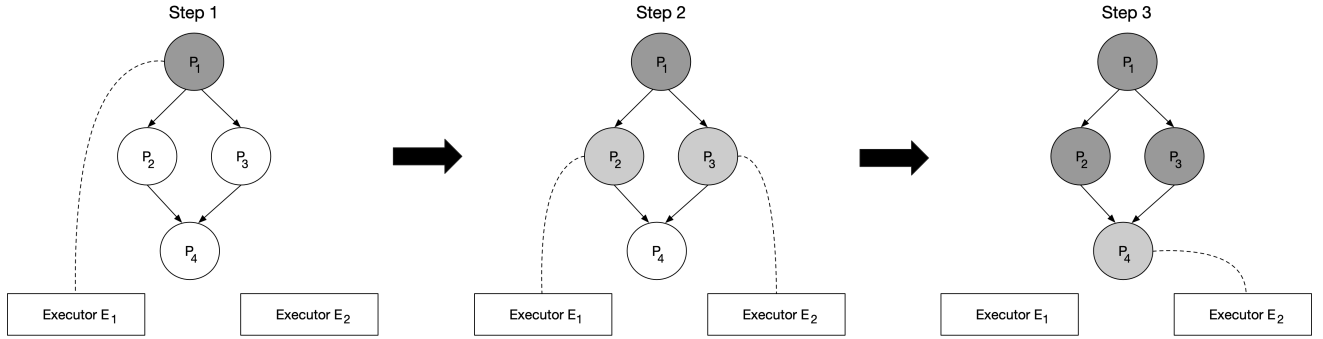


Figure 3: cron management

Table 1: Function Specifications

Function Spec	Function	Executor Type	Priority	Max Exec Time	Max Retries
F_1	gen_nums()	Edge	1	200 s	5
F_2	square()	Cloud	1	200 s	5
F_3	square()	Cloud	1	200 s	5
F_4	sum()	Browser	1	200 s	5

dt = -1000000000 * 60 * 60 * 24 process.PriorityTime = int64(process.FunctionSpec.Priority)*dt + submission-Time.UnixNano()

2.1.2 Cron

TODO

2.1.3 Generators

TODO

2.1.4 Zero-trust security

TODO

3 Evaluation

3.1 Implementation

Table 2: Snapshot of Process Table as in Step 2

Process Id	Function Spec	Wait for Parents	Assigned Executor Id	State	Priority Time
P_1	F_1	<i>False</i>	E_1	Successful	1679906715352024000
P_2	F_2	<i>False</i>	E_1	Running	1679906715353453000
P_3	F_3	<i>False</i>	E_2	Running	1679906715354286000
P_4	F_4	<i>True</i>	-	Waiting	1679906715355188000

Table 3: Dependency Table

Process Id	Name	Dependencies
P_1	$Task_1$	-
P_2	$Task_2$	$Task_1$
P_3	$Task_3$	$Task_1$
P_4	$Task_4$	$Task_2, Task_3$

```

gen_nums = Function(gen_data , colonyid , executortype="edge")
square1 = Function(square , colonyid , executortype="cloud")
square2 = Function(square , colonyid , executortype="cloud")
sum = Function(square , colonyid , executortype="browser")

wf = ColoniesWorkflow("localhost", 50080, colonyid , executor_prvkey)
wf >> gennums
gennums >> square1
gennums >> square2
[square1 , square2] >> sum
res = wf.execute()

```

3.2 References

TODO

Table 4: Input/Output Table

Process Id	Input	Output
P_1		[2,3]
P_2	2	4
P_3	3	9
P_4	[4,9]	13

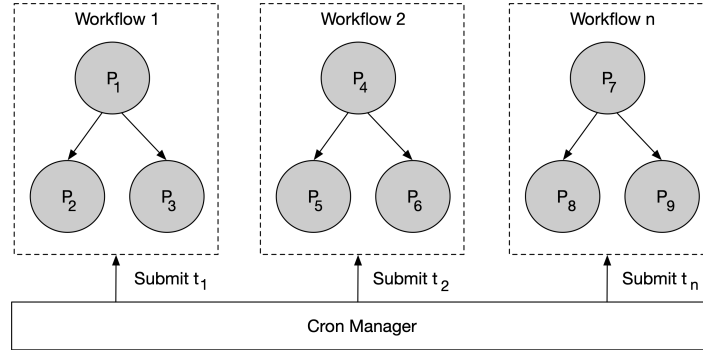


Figure 4: Sample figure caption.