Моделирование систем. Практика 5. Вариант 1

Р. Абдуллин, В. Верхотуров
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РТУ МИРЭА

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1 Модель

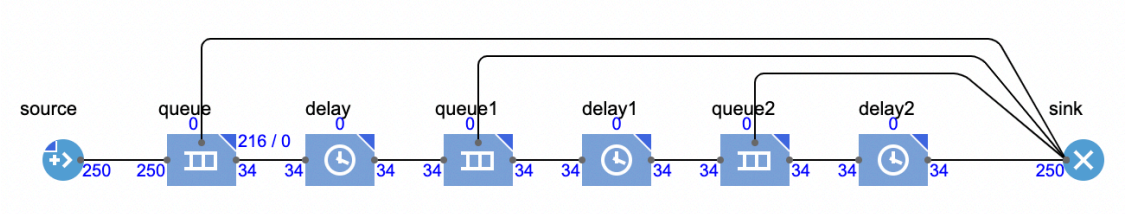

Рис. 1: Конвейерная вычислительная система

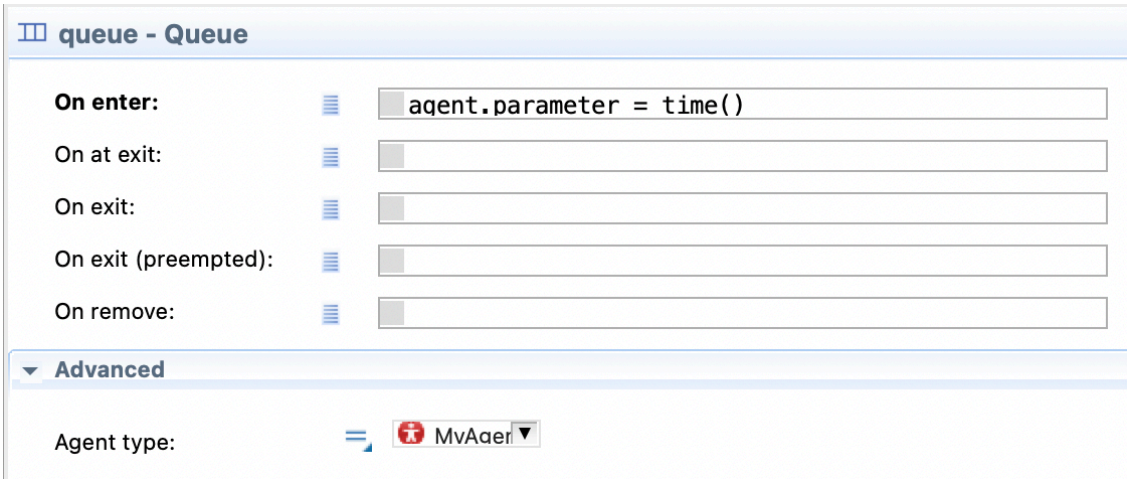

Рис. 2: Триггер при входе агента в первую очередь

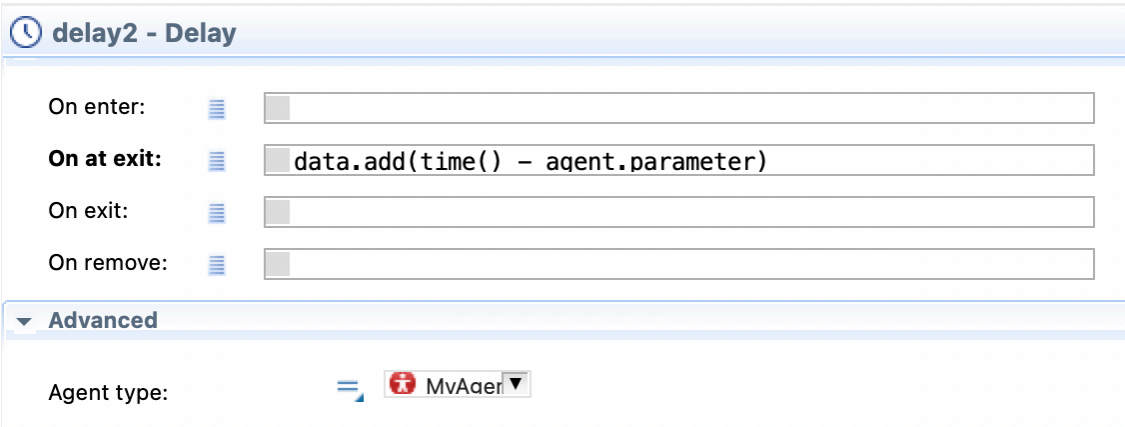

Рис. 3: Триггер при выходе агента из последнего процесса

2 Описание модели

Правило прибытия (сек.) Интенсивность, 3;

Максимальное кол-во сообщений 250;

Размеры:

буфера № 1 30;

буфера № 2 15;

буфера № 3 50;

Время обработки:

процессора № 1 25;

процессора № 2 15;

процессора № 3 5;

Изучаемый параметр время нахождения в системе.

3 Метод распределения

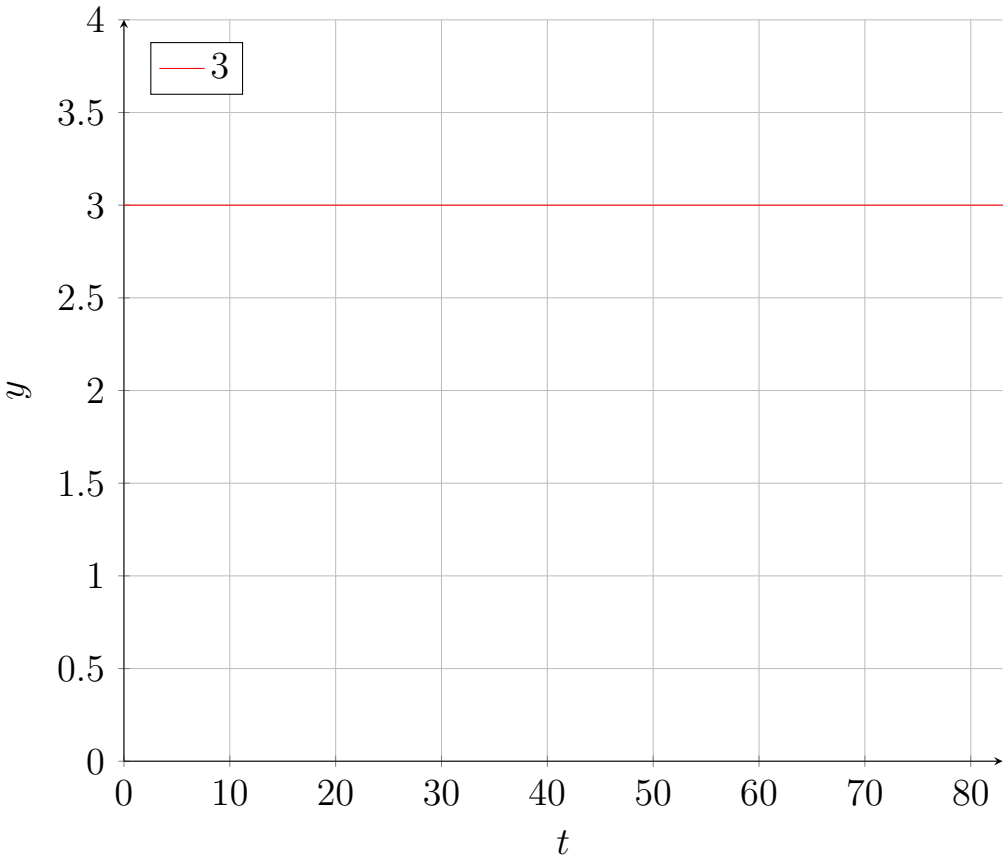

Рис. 4: Функция, описывающая распределение плотности

4 Гистограмма, логи временных интервалов, данные гистограммы

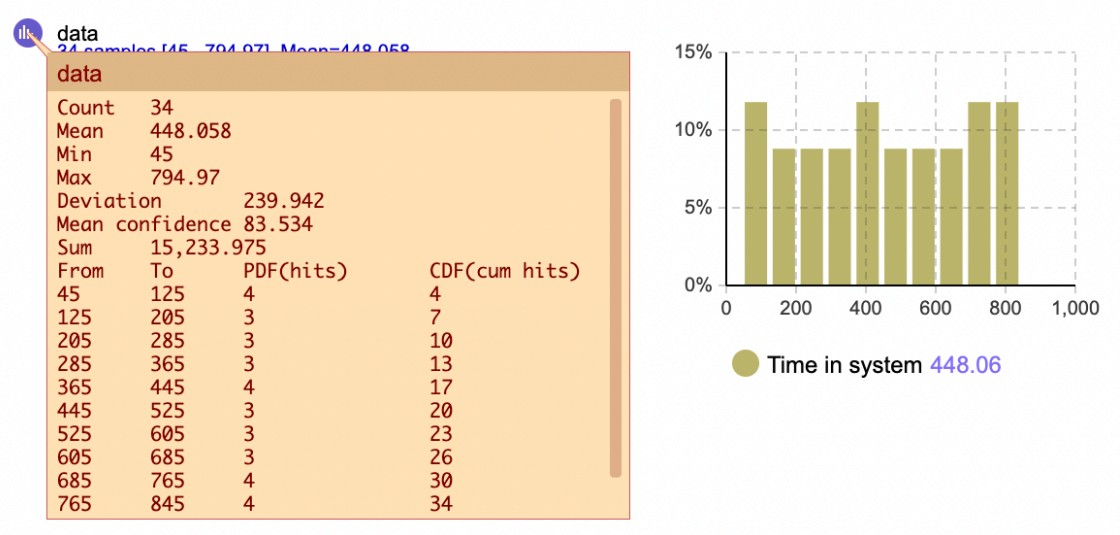

Рис. 5: Гистограмма времени нахождения в системе

Main | datasets_log | histograms_log

	agent_type	agent	name	index	x	y
1	TimeMeasureEnd	timeMeasureEnd	dataset	0	45.105	45
2	TimeMeasureEnd	timeMeasureEnd	dataset		70.105	69.703
3	TimeMeasureEnd	timeMeasureEnd	dataset	2	95.105	94.179
4	TimeMeasureEnd	timeMeasureEnd	dataset	3	120.105	118.812
5	TimeMeasureEnd	timeMeasureEnd	dataset	4	145.105	143.801
6	TimeMeasureEnd	timeMeasureEnd	dataset	5	170.105	167.102
7	TimeMeasureEnd	timeMeasureEnd	dataset	6	195.105	192.09
8	TimeMeasureEnd	timeMeasureEnd	dataset	7	220.105	217.069
9	TimeMeasureEnd	timeMeasureEnd	dataset	8	245.105	242.051
10	TimeMeasureEnd	timeMeasureEnd	dataset	9	270.105	267.03
11	TimeMeasureEnd	timeMeasureEnd	dataset	10	295.105	291.722
12	TimeMeasureEnd	timeMeasureEnd	dataset	11	320.105	316.37
13	TimeMeasureEnd	timeMeasureEnd	dataset	12	345.105	340.962
14	TimeMeasureEnd	timeMeasureEnd	dataset	13	370.105	365.735
15	TimeMeasureEnd	timeMeasureEnd	dataset	14	395.105	390.017
16	TimeMeasureEnd	timeMeasureEnd	dataset	15	420.105	414.93
17	TimeMeasureEnd	timeMeasureEnd	dataset	16	445.105	439.791
18	TimeMeasureEnd	timeMeasureEnd	dataset	17	470.105	464.173
19	TimeMeasureEnd	timeMeasureEnd	dataset	18	495.105	488.849
20	TimeMeasureEnd	timeMeasureEnd	dataset	19	520.105	513.193
21	TimeMeasureEnd	timeMeasureEnd	dataset	20	545.105	538.072
22	TimeMeasureEnd	timeMeasureEnd	dataset	21	570.105	563
23	TimeMeasureEnd	timeMeasureEnd	dataset	22	595.105	586.235
24	TimeMeasureEnd	timeMeasureEnd	dataset	23	620.105	611.02
25	TimeMeasureEnd	timeMeasureEnd	dataset	24	645.105	635.921
26	TimeMeasureEnd	timeMeasureEnd	dataset	25	670.105	660.27
27	TimeMeasureEnd	timeMeasureEnd	dataset	26	695.105	685.027
28	TimeMeasureEnd	timeMeasureEnd	dataset	27	720.105	709.824
29	TimeMeasureEnd	timeMeasureEnd	dataset	28	745.105	734.641
30	TimeMeasureEnd	timeMeasureEnd	dataset	29	770.105	759.113
31	TimeMeasureEnd	timeMeasureEnd	dataset	30	795.105	783.955
32	TimeMeasureEnd	timeMeasureEnd	dataset	31	820.105	794.85
33	TimeMeasureEnd	timeMeasureEnd	dataset	32	845.105	794.497
34	TimeMeasureEnd	timeMeasureEnd	dataset	33	870.105	794.97

Рис. 6: Логи временных интервалов при выходе из системы

Main | datasets_log | histograms_log

	agent_type	agent	name	start	end	pdf	cdf
1	TimeMeasureEnd	timeMeasureEnd	distribution	45	86.6	0.059	0.059
2	TimeMeasureEnd	timeMeasureEnd	distribution	86.6	128.2	0.059	0.118
3	TimeMeasureEnd	timeMeasureEnd	distribution	128.2	169.8	0.059	0.176
4	TimeMeasureEnd	timeMeasureEnd	distribution	169.8	211.4	0.029	0.206
5	TimeMeasureEnd	timeMeasureEnd	distribution	211.4	253	0.059	0.265
6	TimeMeasureEnd	timeMeasureEnd	distribution	253	294.6	0.059	0.324
7	TimeMeasureEnd	timeMeasureEnd	distribution	294.6	336.2	0.029	0.353
8	TimeMeasureEnd	timeMeasureEnd	distribution	336.2	377.8	0.059	0.412
9	TimeMeasureEnd	timeMeasureEnd	distribution	377.8	419.4	0.059	0.471
10	TimeMeasureEnd	timeMeasureEnd	distribution	419.4	461	0.029	0.5
11	TimeMeasureEnd	timeMeasureEnd	distribution	461	502.6	0.059	0.559
12	TimeMeasureEnd	timeMeasureEnd	distribution	502.6	544.2	0.059	0.618
13	TimeMeasureEnd	timeMeasureEnd	distribution	544.2	585.8	0.029	0.647
14	TimeMeasureEnd	timeMeasureEnd	distribution	585.8	627.4	0.059	0.706
15	TimeMeasureEnd	timeMeasureEnd	distribution	627.4	669	0.059	0.765
16	TimeMeasureEnd	timeMeasureEnd	distribution	669	710.6	0.059	0.824
17	TimeMeasureEnd	timeMeasureEnd	distribution	710.6	752.2	0.029	0.853
18	TimeMeasureEnd	timeMeasureEnd	distribution	752.2	793.8	0.059	0.912
19	TimeMeasureEnd	timeMeasureEnd	distribution	793.8	835.4	0.088	
20	TimeMeasureEnd	timeMeasureEnd	distribution	835.4	877	0	0.059

Рис. 7: Данные гистограммы

5 Анализ системы

216 сообщений были утеряны в буфере 1. Возможно распараллеливание процесса 1 или буфера 1.

6 Вывод

Построена и исследована модель конвейерных вычислительных систем, проведён ее анализ.