Linnéuniversitetet
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Preformance Engineering's Assignment

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Course code: 2DV608

Introduction

This report shows the results of the mathematical representation for a software system that executes web requests from users from the Internet.

Exercise A:

1. calculate the average number of visits V_k to the WinnerPaymentServer

   Sk = 0.3s

   Snice 20% of the user session goes to WinnerPaymentServer after the WebServer that is means

   Ck = C . 20% = 80 . 0.2 = 16

   Form the formula Sk = Bk/Ck => 0.3 = Bk / 16 => Bk = 4.8

   Form the formula Dk = Bk / C => Dk = 4.8/80 => Dk = 0.06

   From the formula Dk = Vk . Sk => 0.06 = Vk . 0.3 => Vk = 0.06/0.3

   $$V_k = 0.2$$

2. calculate the service time S_k of the BettingServer

   Snice 60% of the user session goes to BettingServer after the PlayerEngagementServer that is means

   Ck = C . 60% = 80 . 0.6 = 48

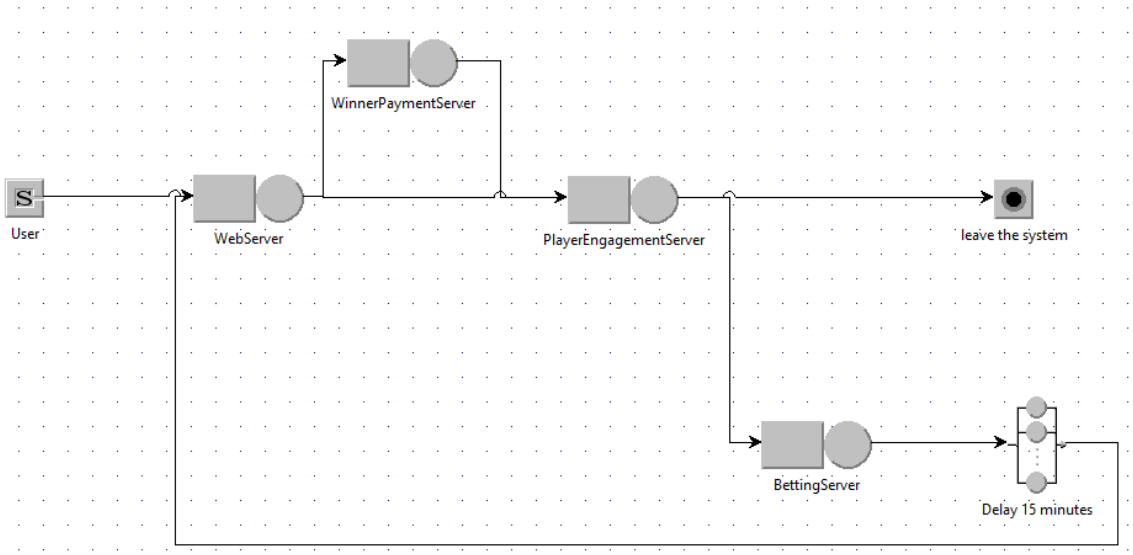
   Bk = T . 40% => Bk = 60 . 0.4 => Bk = 24s

   From the formula Sk = Bk/Ck => Sk = 24 / 48 => Sk = 0.5

   $$S_k = 0.5$$

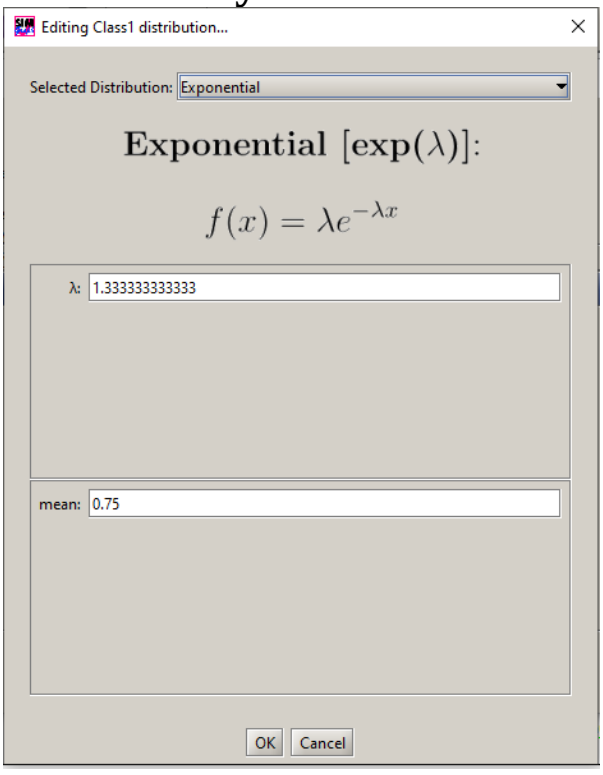
Exercise B:

Model:

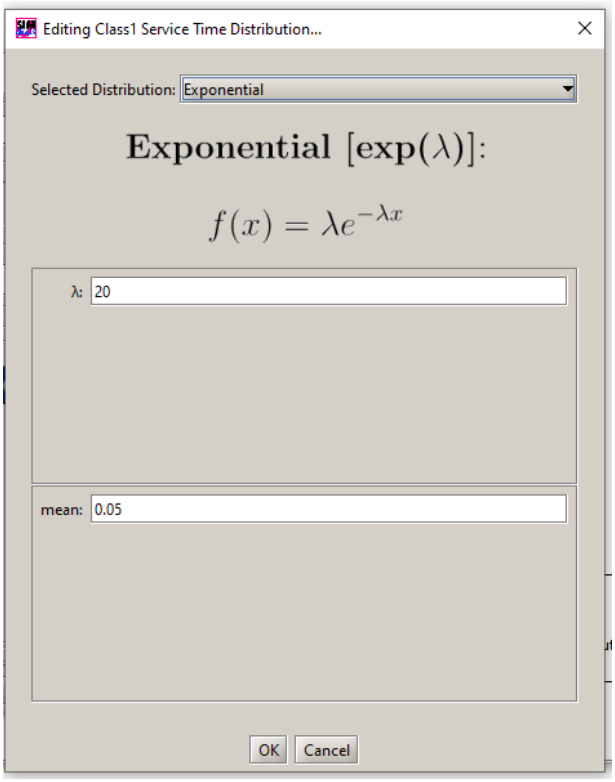


Service Time:

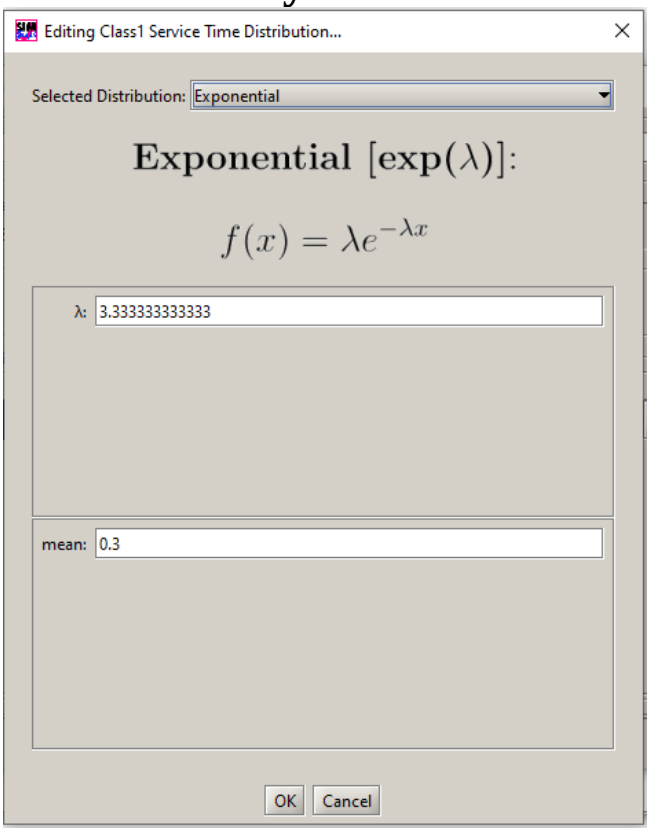
System



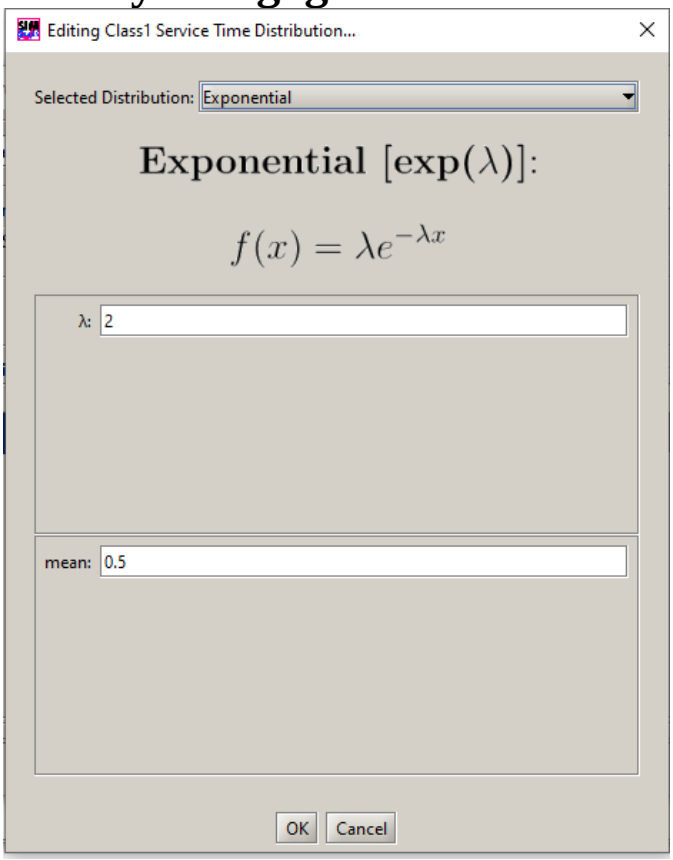
WebServer



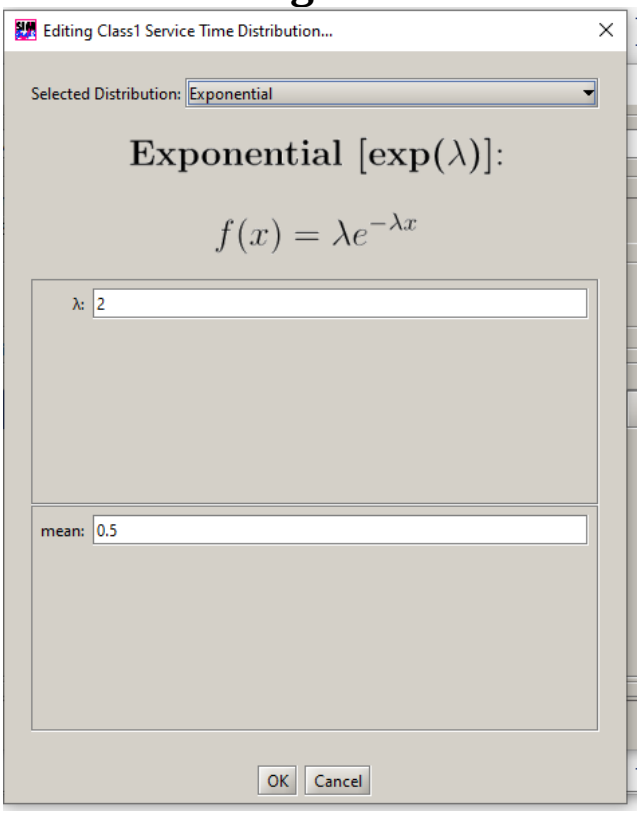
WinnerPaymentServer



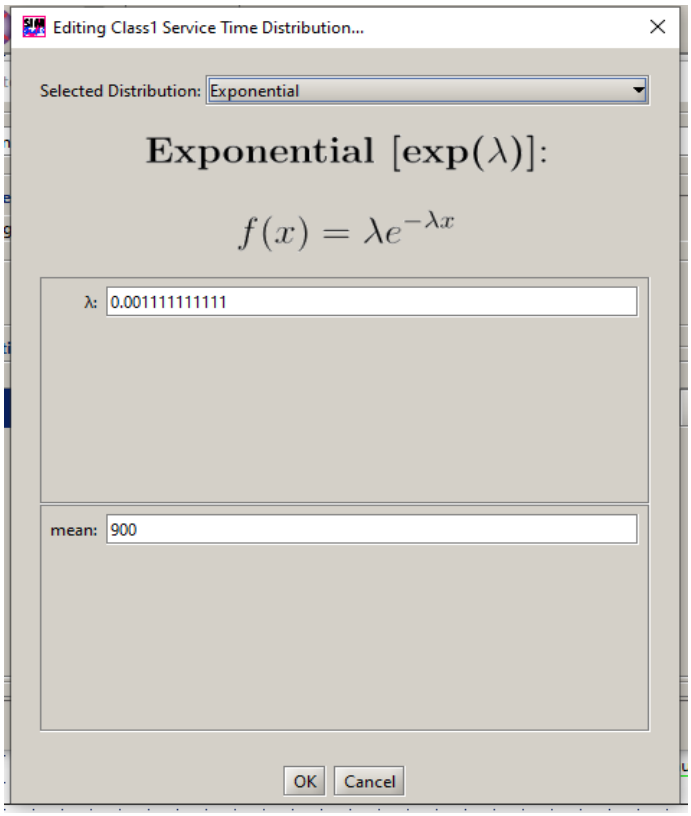
PlayerEngagementServer



BettingServer

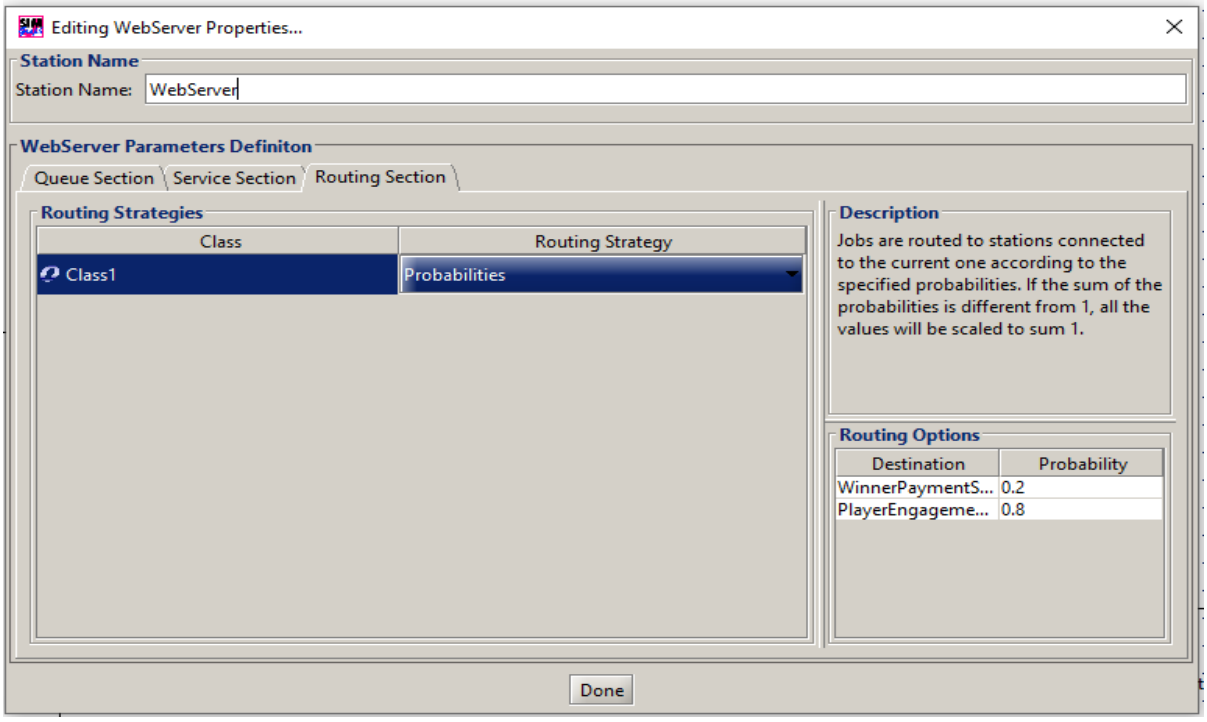


Delay 15 minutes

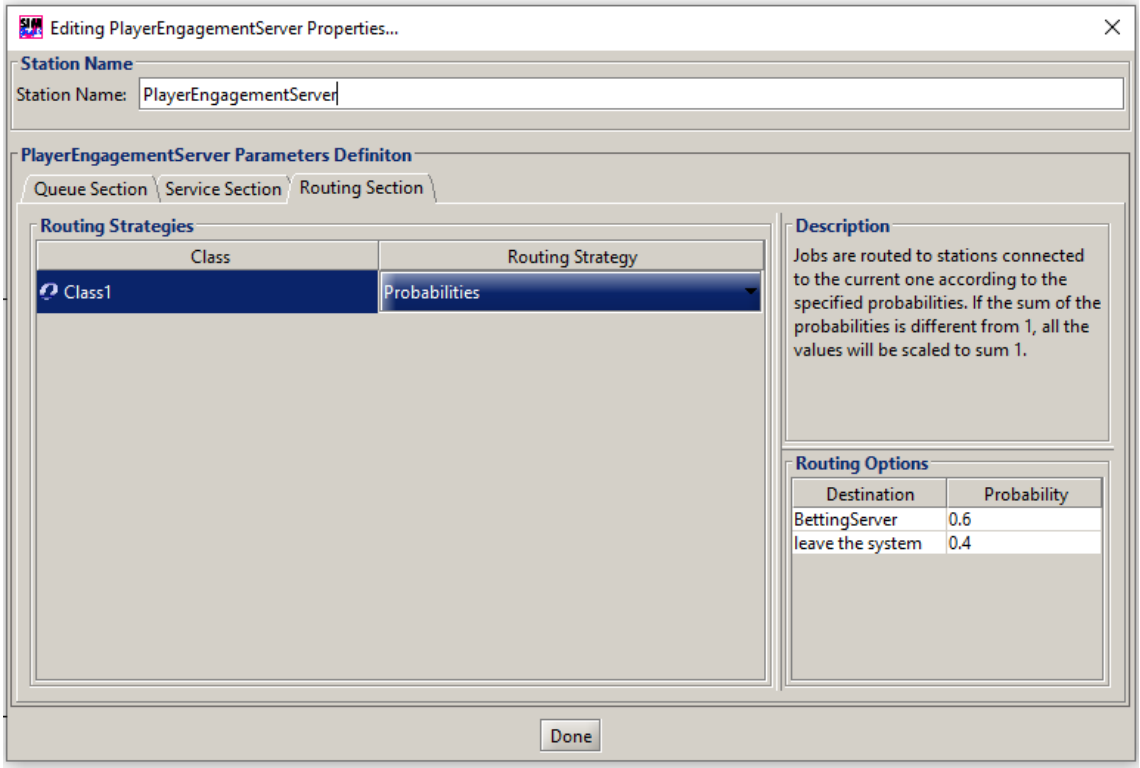


Routing probabilities:

WebServer

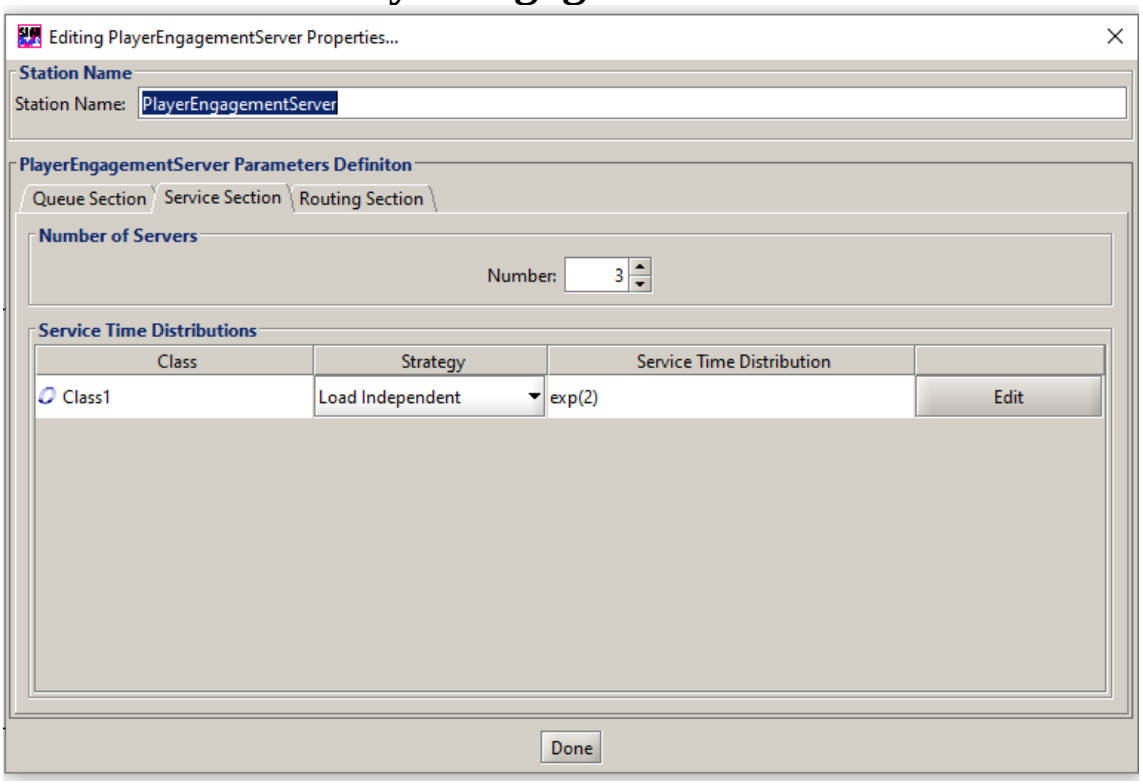


PlayerEngagementServer

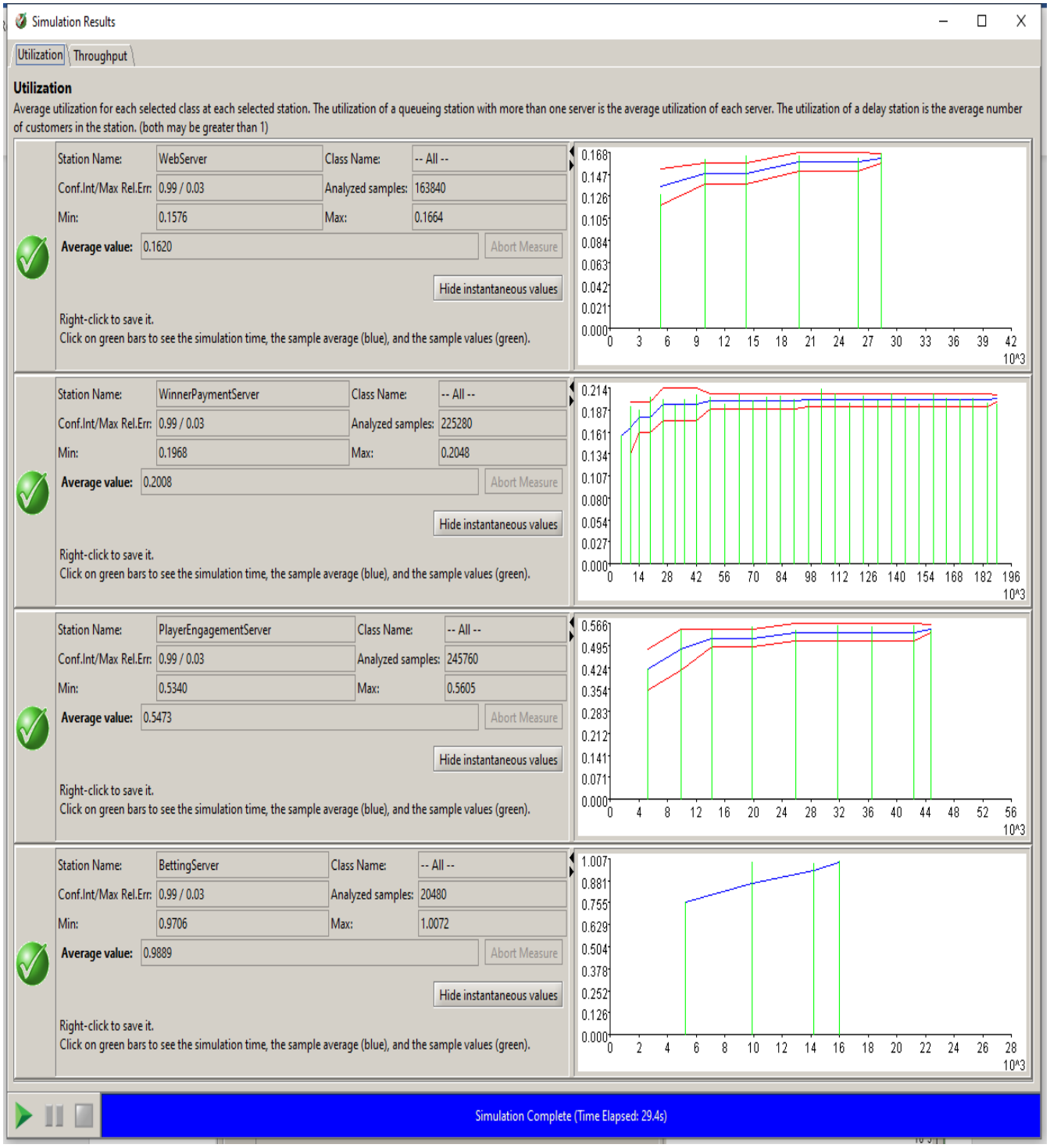


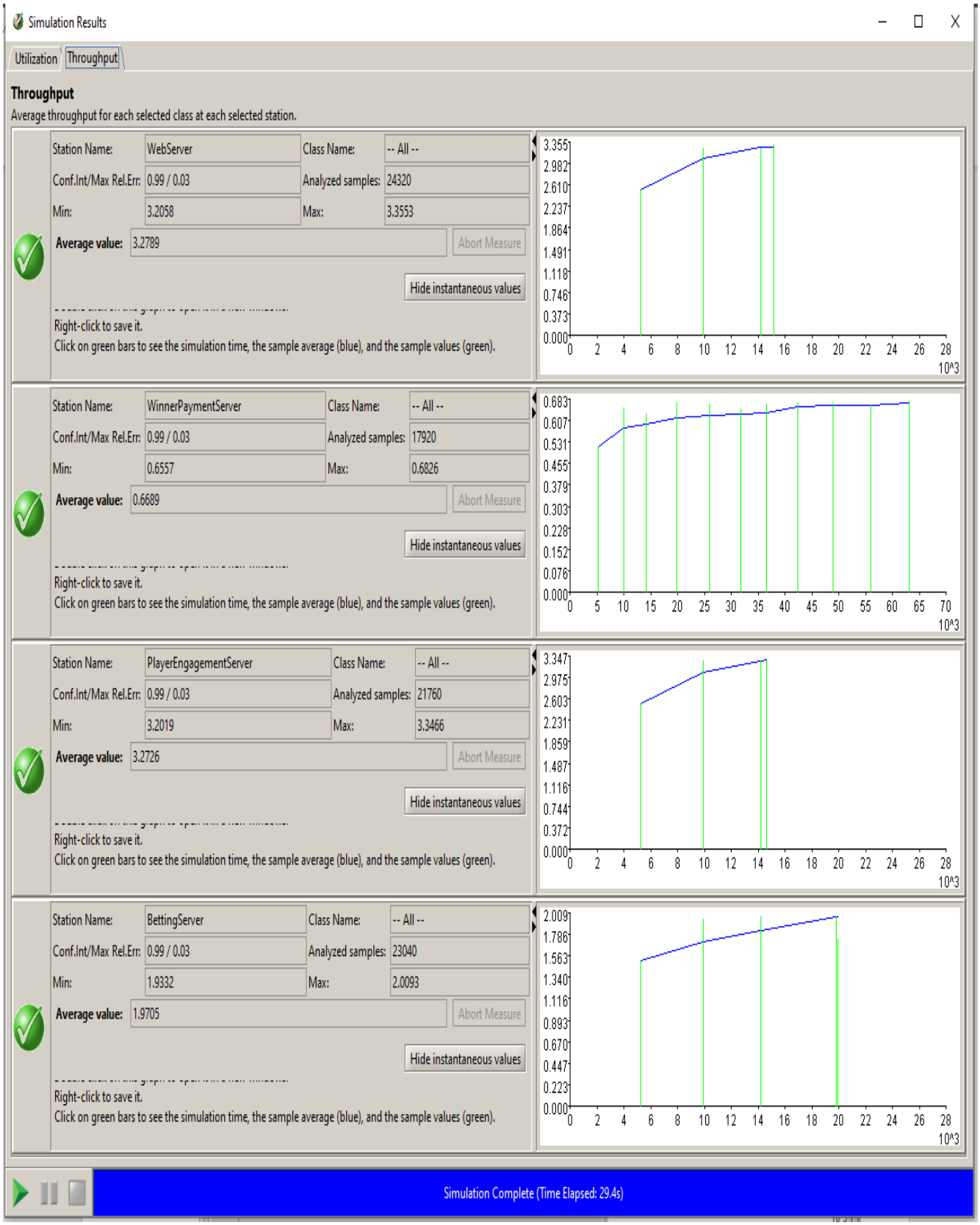
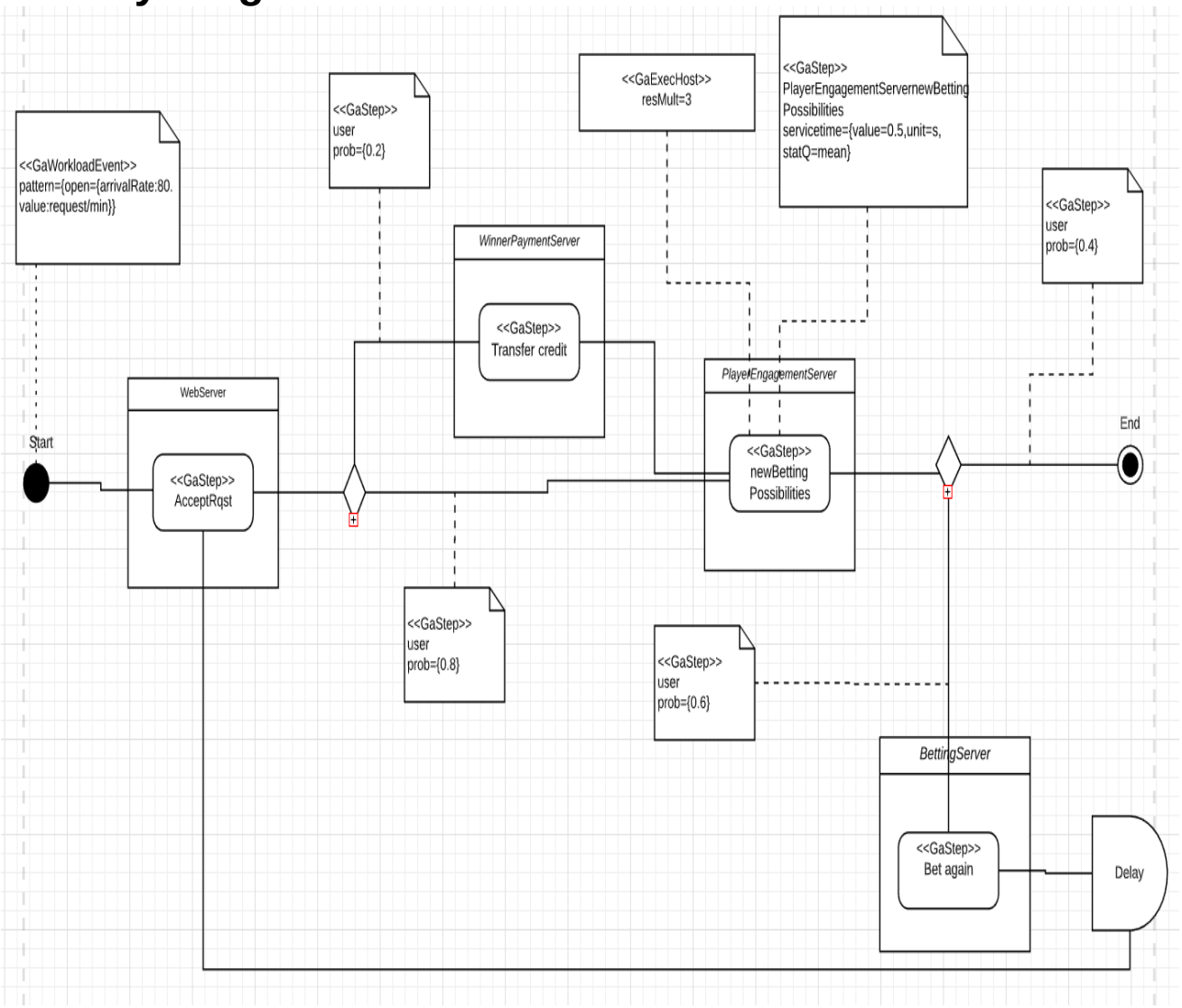
Resources:

PlayerEngagementServer



Utilization and Throughput of each of the four components




Simulation Results
Utilization
Throughput
Throughput
Average throughput for each selected class at each selected station.
Station Name: WebServer
Class Name: -- All --
Conf.Int/Max Rel.Err: 0.99 / 0.03
Analyzed samples: 24320
Min: 3.2058
Max: 3.3553
Average value: 3.2789
Abort Measure
Hide instantaneous values
Right-click to save it.
Click on green bars to see the simulation time, the sample average (blue), and the sample values (green).
3.355 2.982 2.610 2.237 1.864 1.491 1.118 0.746 0.373 0.000
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28
10^3
Station Name: WinnerPaymentServer
Class Name: -- All --
Conf.Int/Max Rel.Err: 0.99 / 0.03
Analyzed samples: 17920
Min: 0.6557
Max: 0.6826
Average value: 0.6689
Abort Measure
Hide instantaneous values
Right-click to save it.
Click on green bars to see the simulation time, the sample average (blue), and the sample values (green).
0.683 0.607 0.531 0.455 0.379 0.303 0.228 0.152 0.076 0.000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70
10^3
Station Name: PlayerEngagementServer
Class Name: -- All --
Conf.Int/Max Rel.Err: 0.99 / 0.03
Analyzed samples: 21760
Min: 3.2019
Max: 3.3466
Average value: 3.2726
Abort Measure
Hide instantaneous values
Right-click to save it.
Click on green bars to see the simulation time, the sample average (blue), and the sample values (green).
3.347 2.975 2.603 2.231 1.859 1.487 1.116 0.744 0.372 0.000
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28
10^3
Station Name: BettingServer
Class Name: -- All --
Conf.Int/Max Rel.Err: 0.99 / 0.03
Analyzed samples: 23040
Min: 1.9332
Max: 2.0093
Average value: 1.9705
Abort Measure
Hide instantaneous values
Right-click to save it.
Click on green bars to see the simulation time, the sample average (blue), and the sample values (green).
2.009 1.786 1.563 1.340 1.116 0.893 0.670 0.447 0.223 0.000
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28
10^3
Simulation Complete (Time Elapsed: 29.4s)

Activity Diagram: