



Assignment

Performance Engineering



Author: Rashed QAZIZADA
Area: Computer Science
Supervisor: Diego Perez
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Abstract

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Keywords

Place your keywords here

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1 Introduction

This report is going to study the performance of software that executes Web sessions from users on the internet. The system offers a betting service to the users.

The running system has been observed during 1 regular week. During that week, the system executed 806400 user sessions have been completed. In addition, This report uses the operational laws to calculate the average number of visits V_k to the *WinnerPaymentServer* for each user session and the service time S_k of the *BettingServer* [1].

1.1 Calculations

Observation time: $T=1 \text{ week} = 7 \text{ days} = 7 \times 24 = 168 \text{ hours} = 10080 \text{ minutes} = 604800 \text{ seconds}$

$C=\text{Completion time}=806400 \text{ user session completion time}$

$$X=C/T=X=806400 / 604800 = 1.33333333$$

$$\lambda k = A_k/T =$$

The arrival rate=80 session/minutes=80/60=1.333333 session/s

1.1.1 WinnerPaymentServer

$C_k=C*20\% = C_k = 806400*0.2=161280$ executed request in WinnerPaymentServer which happened to be 20% of all requests

$U_k=20\%$

$S_k=300\text{ms}$

$V_k= C_k /C=161280/806400=0.2$ the average number of visits per completed jobs

1.1.2 PlayerEngagementServer

60% of users play

40% of users leave

1.1.3 BettingServer

The completed time for 60% of users can be:

$C_k=C*0.6=483840$ betting again “losers and winners”

$C_k=C*0.4=322560$ leaves the system

The utilization of BettingServer is: The BettingServer has been found busy 40% of time

$U_k=B_k/T$

$B_k=T*U_k$

$B_k=604800*0.4=241920 \text{ s}$

$S_k=B_k/C_k = 241920/483840=0.5$

1.1.4 Calculation table

Server	Service Rate	Service Time
<i>WebServer</i>	$1/0.05=20$	50ms=0.05s
<i>WinnerPaymentServer</i>	$1/0.3=3.333333$	300ms=0.3s
<i>PlayerEngagementServer</i>	$1/0.5=2$	500ms=0.5s
<i>BettingServer</i>	$1/0.5=0.6666666666666667$	0.5s

2 Model

Queueing Networks Design

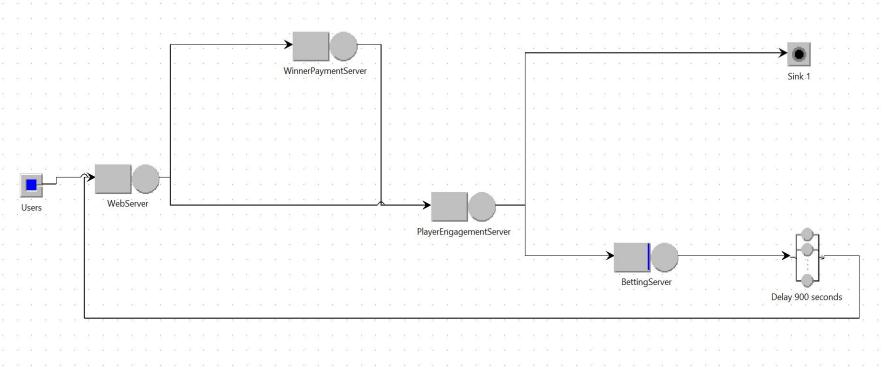


Figure 1: JMT Queueing Network simulation engine

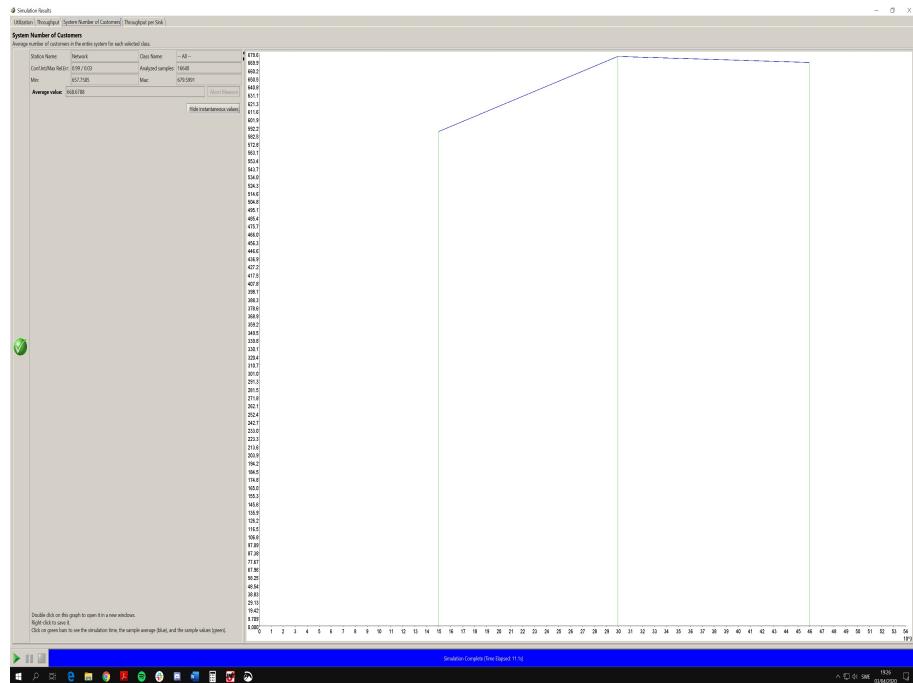


Figure 2: JMT Queueing Network System Number Of Customer simulation engine

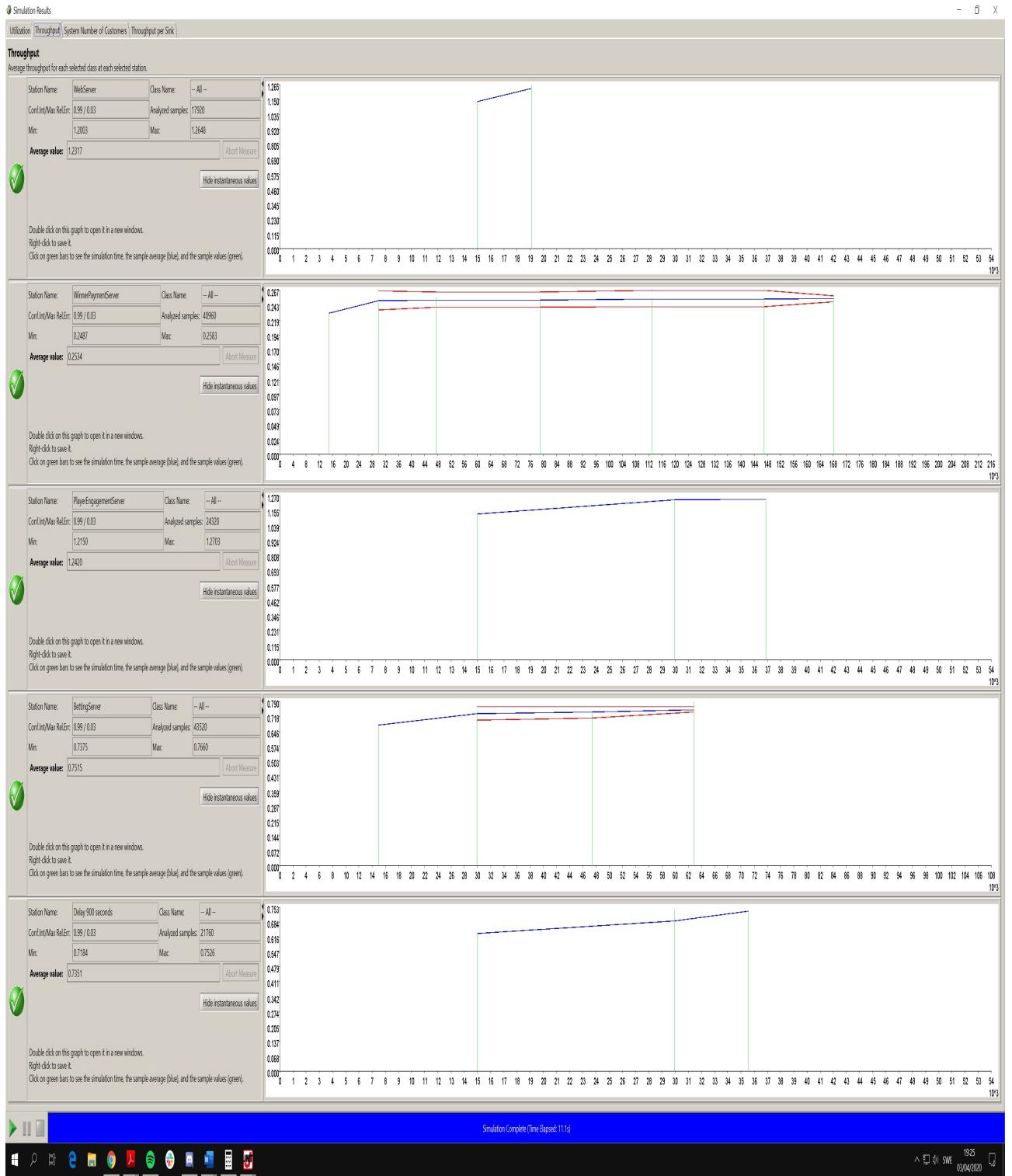


Figure 3: JMT Queueing Network Throughput simulation engine
Throughput of each of the four components in the system

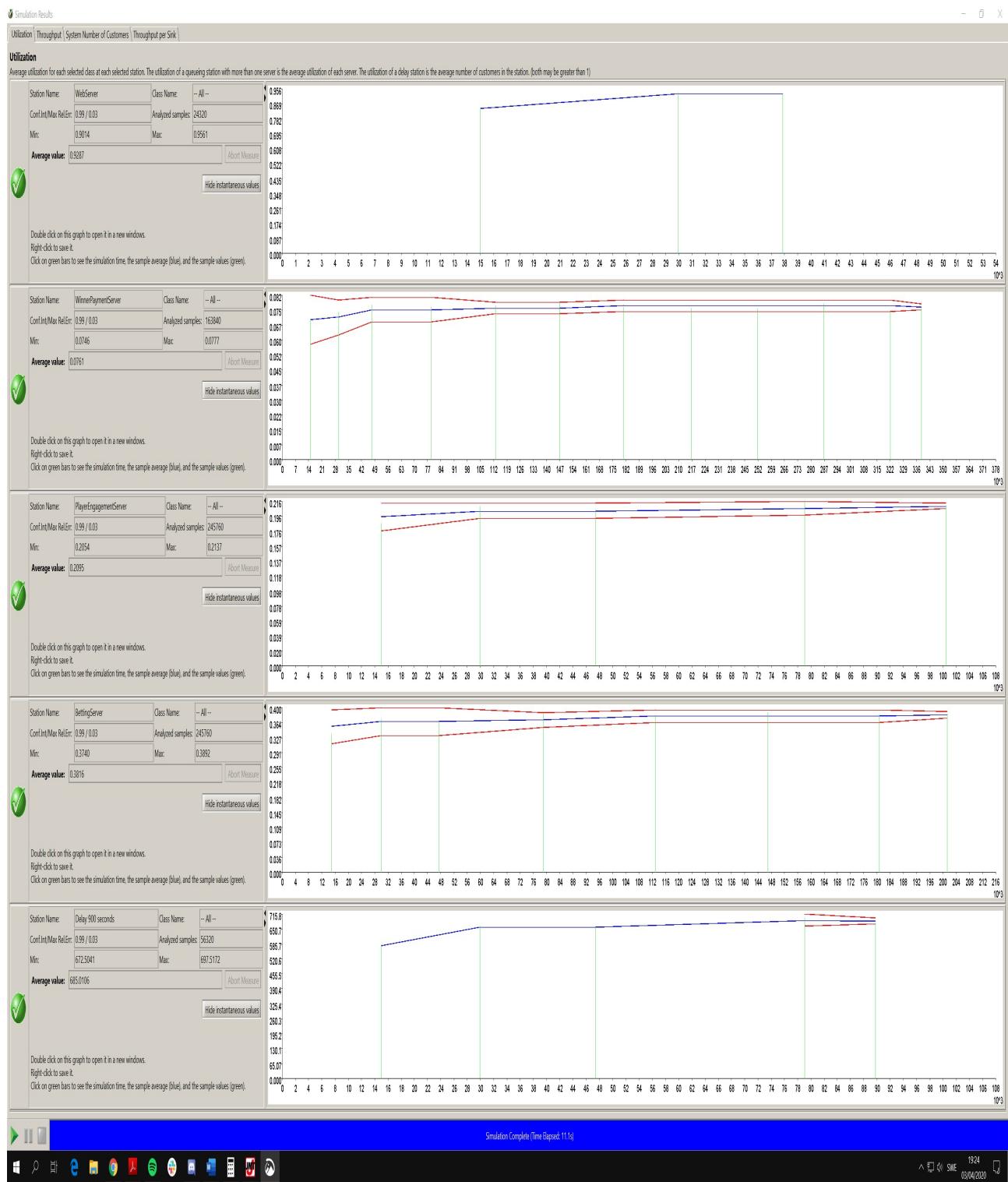


Figure 4: JMT Queueing Network Utilization simulation engine
Utilization of each of the four components in the system

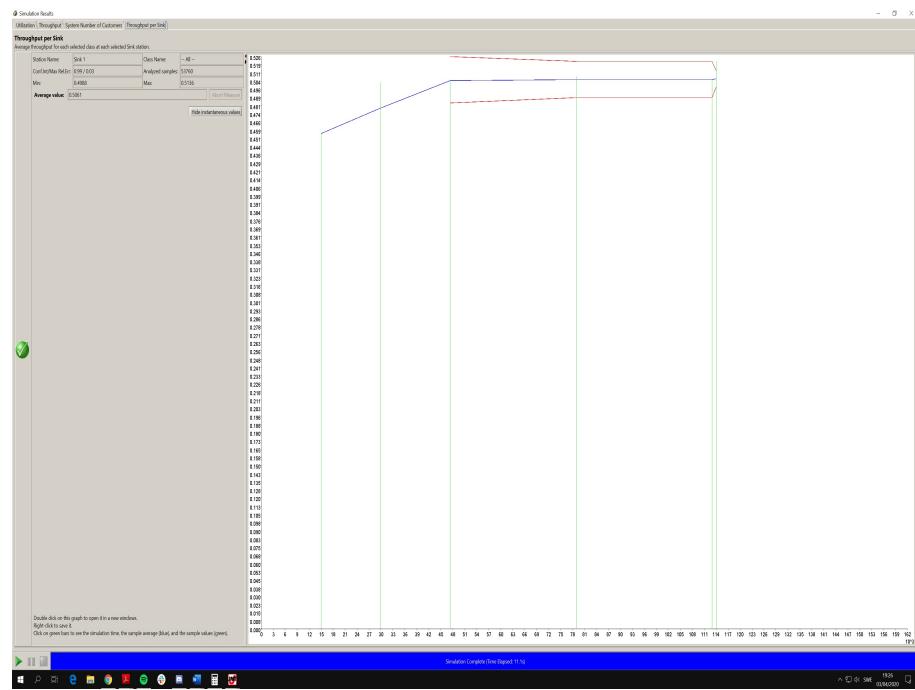


Figure 5: JMT Queueing Network Throughput Per Sink simulation engine

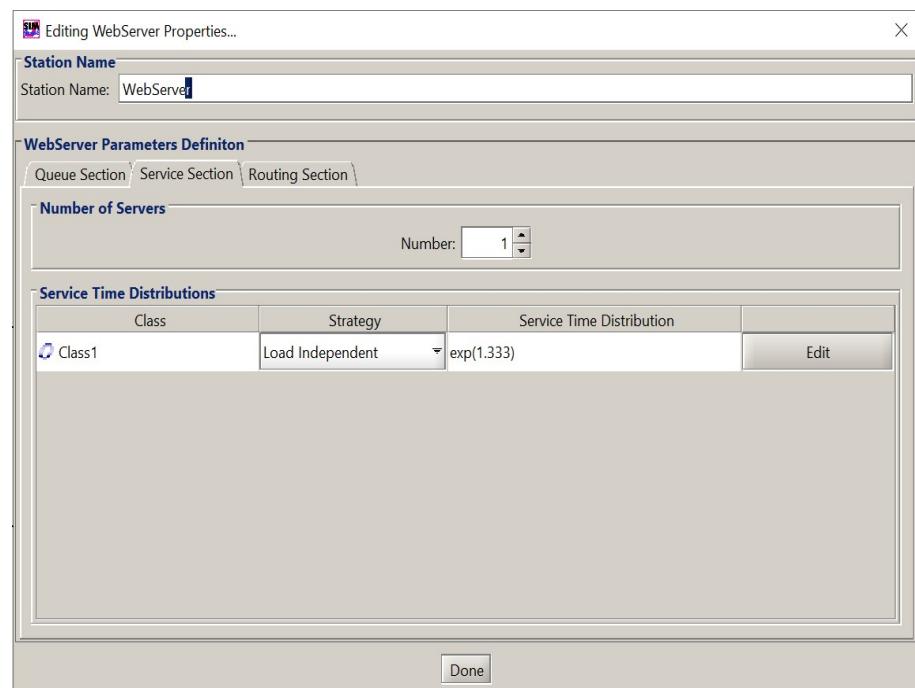


Figure 6: JMT Queueing Network webserver servicesection simulation engine

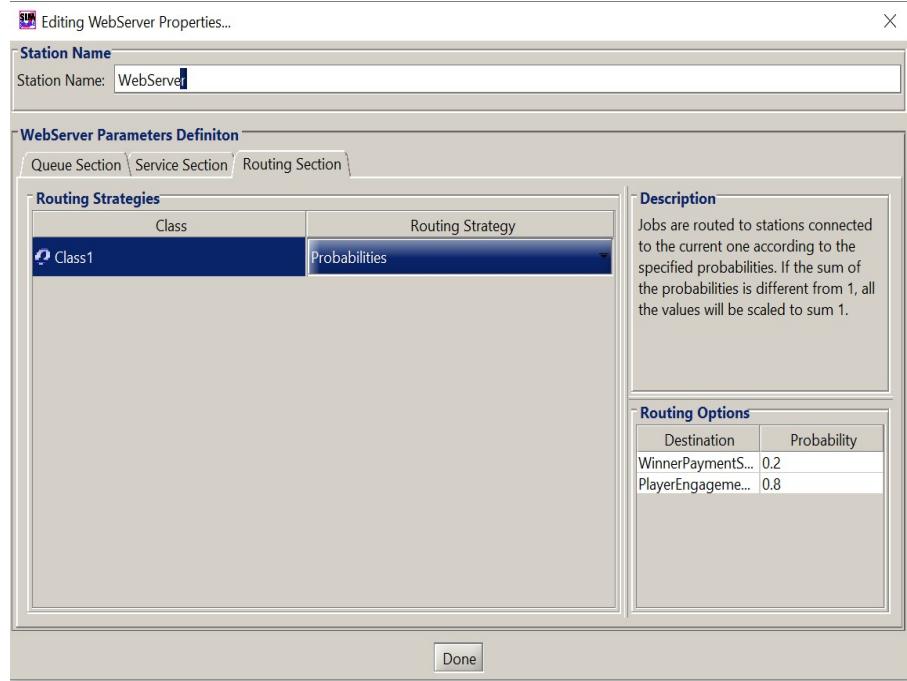


Figure 7: JMT Queueing Network Webserver Routing Section simulation engine
Routing the incoming requests to WinnerPaymentServer 20% which 0.2 probability and 80% which is 0.8 probability to PlayerEngagementServer.

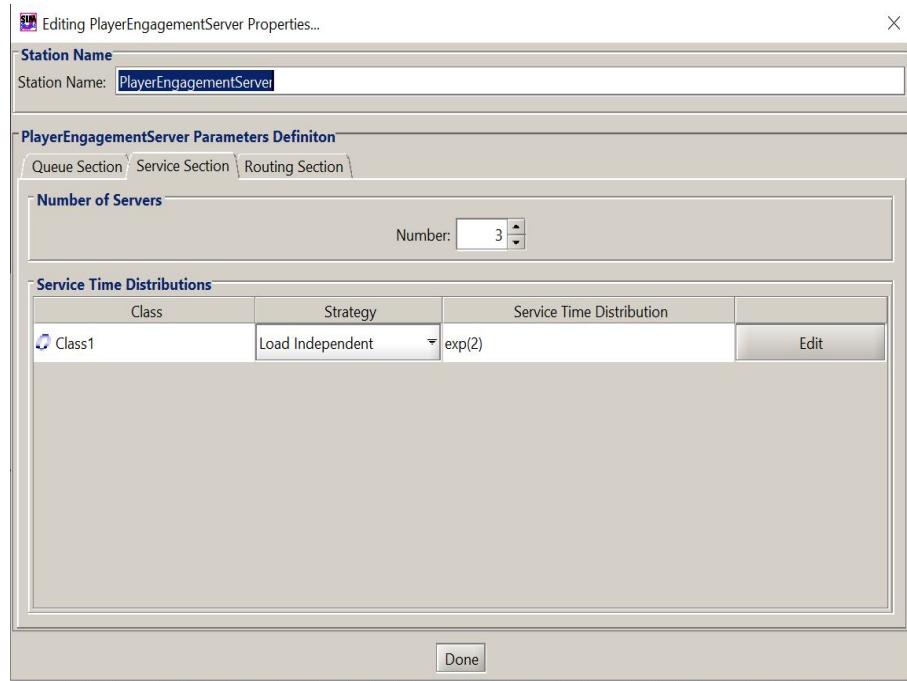


Figure 8: JMT Queueing Network PlayerEngagementServer Service Sector simulation engine

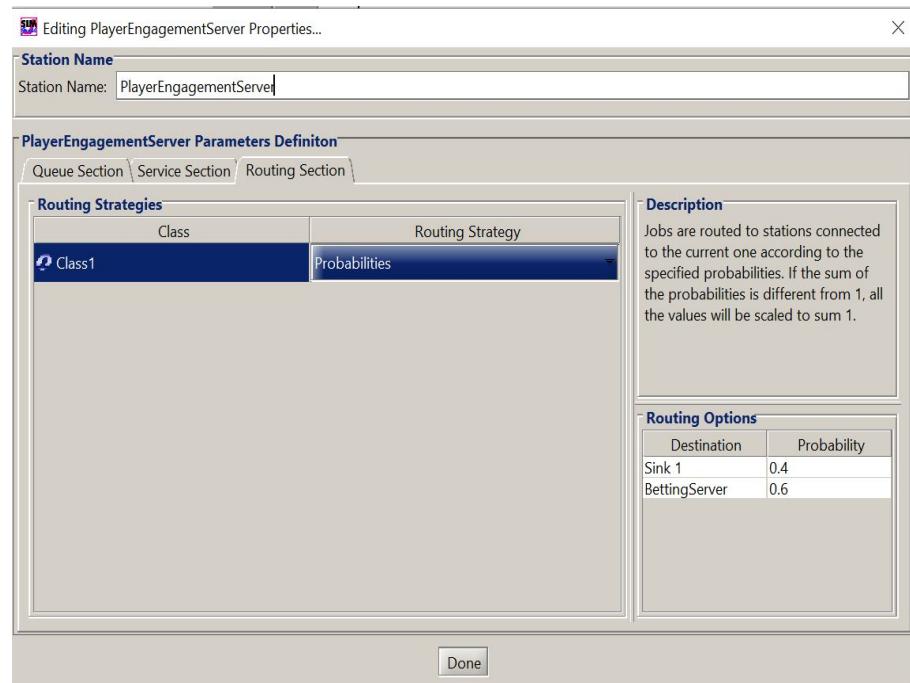


Figure 9: JMT Queueing Network PlayerEngagementServer Routing Section simulation engine

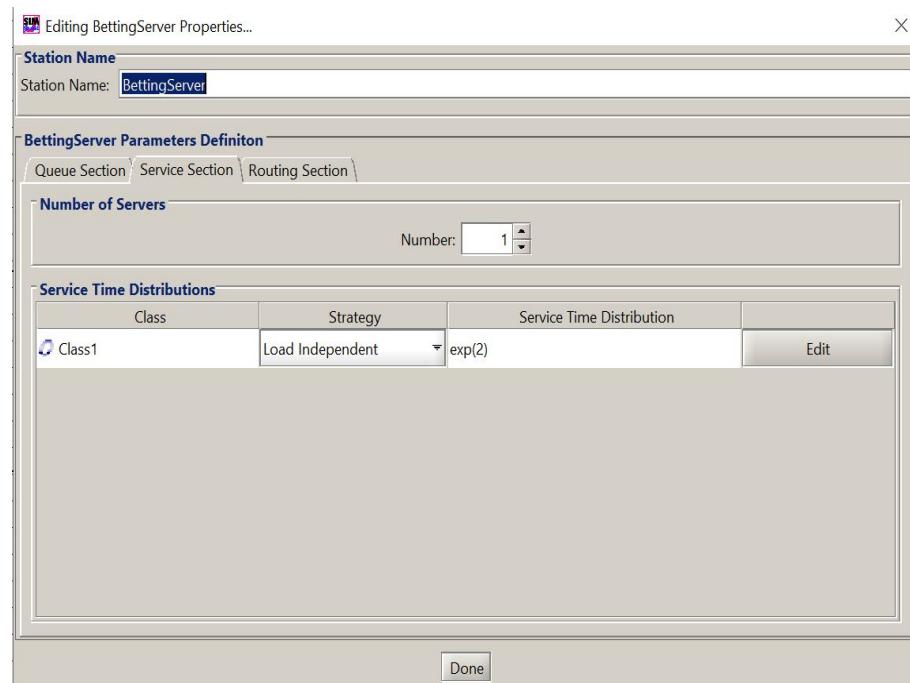


Figure 10: JMT Queueing Network BettingServer Service Section simulation engine

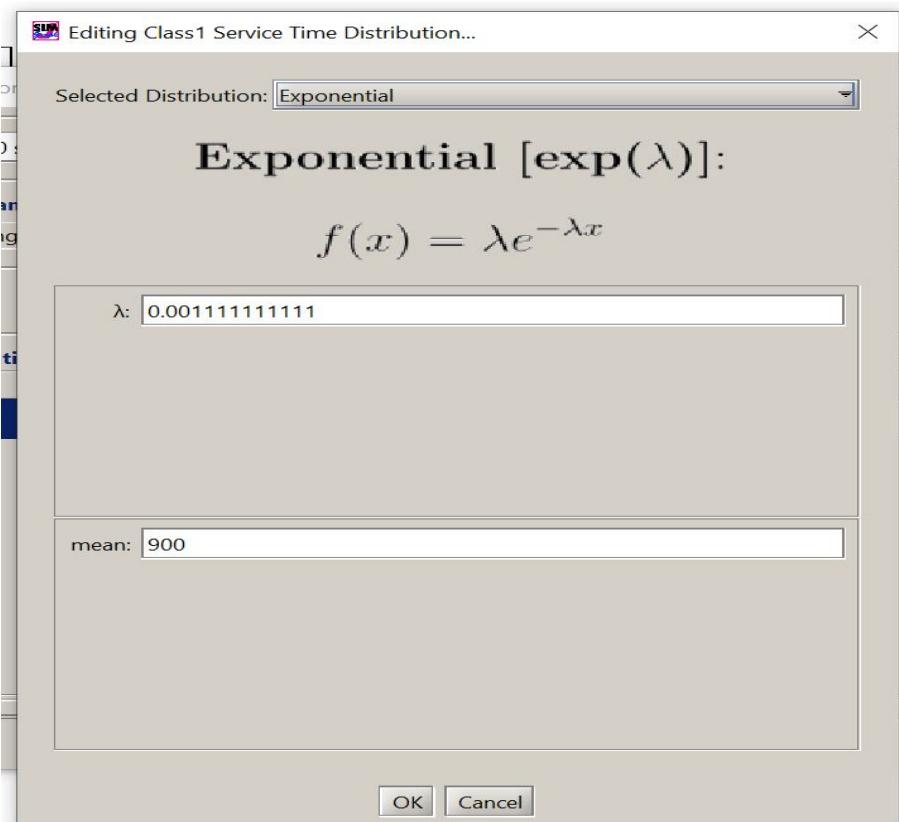


Figure 11: JMT Queueing Network simulation engine

3 Activity Diagram

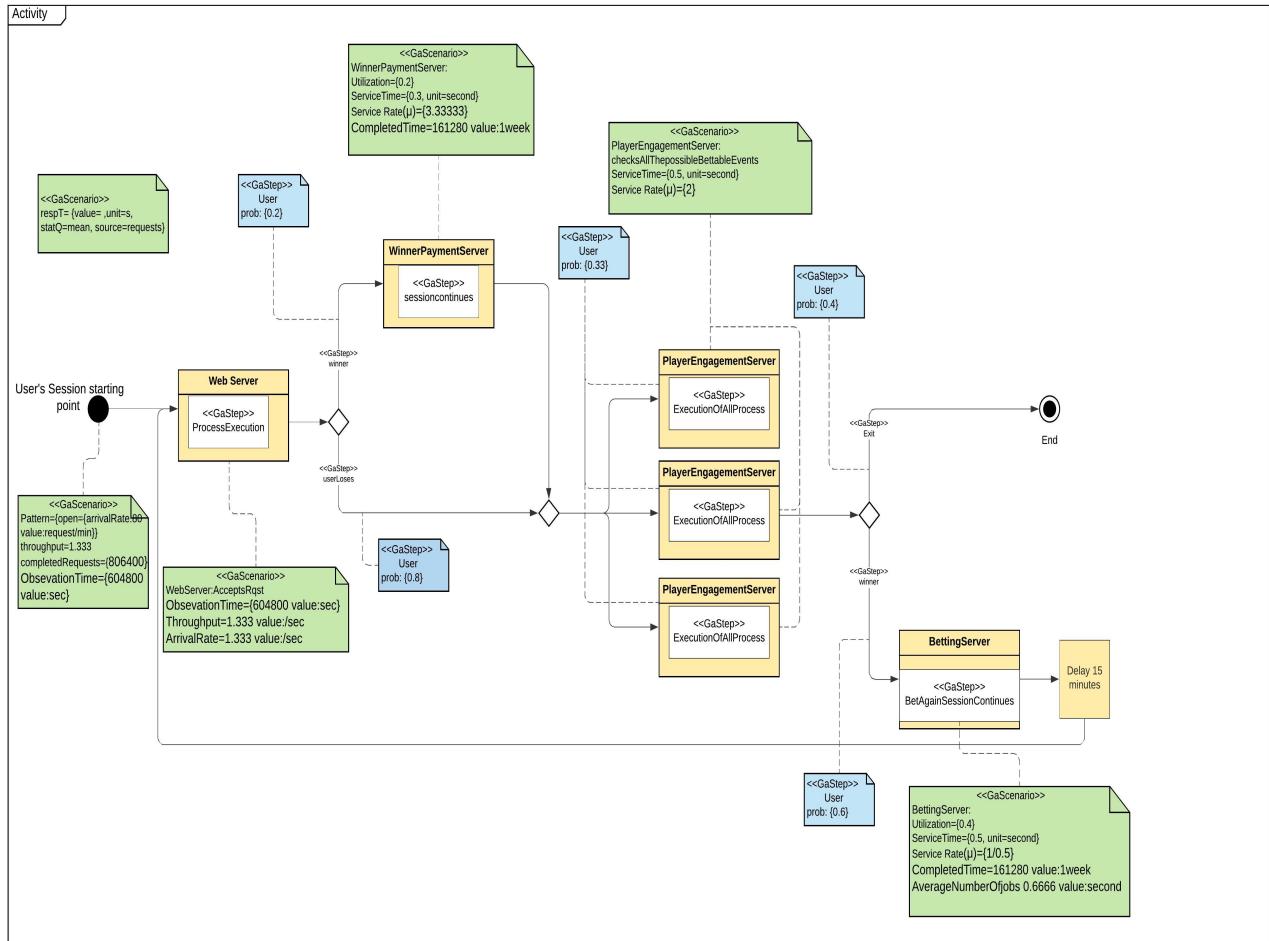


Figure 12: Activity diagram

4 References

References

- [1] *Performance Engineering retake document*
<https://mymoodle.lnu.se/mod/assign/view.php?id=2781618>