CSCI 578 Assignment #3 Part 2

Assignment #3 Part 2 Tasks for Odd Number Teams

Things you should **NOT** do

During your sessions, you must NOT do the following:

1. You must **NOT** do any undo/redo (neither of pressing Ctrl+Z nor clicking the Undo menu item.
2. You must **NOT** modify your partner's part of the model.

Notes

- You can find the generated simulation files under [FLAME home]\models\[latest timestamp]
- You may use the CSV_Analyzer to analyze the .csv files.
- Communication with your partner can only be done via emails.
- Count the number of emails you exchanged with your partner for each session.
- Count the number of simulations you ran for each session.

Task Set Distribution

Session #	Configuration	Student 1	Student 2
1	w/o proactive conflict detection	Task 1-1	Task 1-2
2	with proactive conflict detection	Task 2-1	Task 2-2

Scenario

You are a senior software architect at *SoCal Software Services* (SCSS) Today, SCSS made a consulting contract with a client company. The client company has a legacy system called the Next-Generation Climate Architecture, and they want to make some improvements to the system. You are assigned with the project for which you need to make a set of trade-off design decisions.

Task 1

The NGCA system has these nonfunctional property (NFP) global requirements:

- The response rate (number of responses / number of requests) **must be greater than 95%**.
- The average latency at the monitored interfaces **must be less than 40**
- The overall energy consumption **must be less than 10,000,000**
- The maximum memory use **must be less than 800**

<table>
<tr><th>Task Set #</th><th>Task</th></tr>
<tr><td>Task 1-1</td><td>It has been 10 years since the client company began using the legacy SalinityReqGen component in their NGCA. The client company is not satisfied with the rate at which SalinityReqGen can create and send requests, and they want to replace the component with newer ones.
You did a thorough search with which newer components you could replace SalinityReqGen, and eventually found three with following characteristics:

<table>
<tr><td>Option</td><td>Execution time of the Task generate in Process generateRequest</td><td>Memory usage of the Task generate in Process generateRequest</td><td>SalinityReqGen’s corresponding Host energy coefficients</td></tr>
<tr><td>1</td><td>4 [↓↓]</td><td>250 [↑]</td><td>50/200/65/240 [↑]</td></tr>
<tr><td>2</td><td>7 [↓]</td><td>3 [as-is]</td><td>50/200/65/240 [↑]</td></tr>
<tr><td>3</td><td>6 [↓]</td><td>250 [↑]</td><td>12/45/18/48 [as-is]</td></tr>
</table>

You goal is to find which combination(s) of the three above for each of SalinityReqGen (e.g. option 2 for User1, option 3 for User2, and option 1 for User3) that the current NGCA has makes <u>the most number of requests</u> in the given amount of time (2,500 units of time).</td></tr>
<tr><td>Task 1-2</td><td>The client company was hit by a huge financial downturn last year, and they desperately need to cut cost down. Unfortunately, the budget for their NGCA has been drastically reduced as a result. The problem is that they have continuously been paying license for the use of the two FTP connectors that they implemented in the NGCA. They want to replace the connectors with cheaper ones while maintaining the minimum necessary throughput.
You did a thorough search with which cheaper connectors you could replace those connectors, and eventually found three with following characteristics:

<table>
<tr><td>Option</td><td>$/yr</td><td>Execution time of the Task forward in Process forwardResponse</td><td>Memory usage of the Task forward in Process forwardResponse</td><td>FTP connector’s corresponding Host energy coefficients</td></tr>
<tr><td>1</td><td>1.1k</td><td>7 [↑]</td><td>15 [↑]</td><td>12/40/20/70 [↑]</td></tr>
<tr><td>2</td><td>2.3k</td><td>0 [as-is]</td><td>1 [as-is]</td><td>12/40/20/70 [↑]</td></tr>
<tr><td>3</td><td>2.1k</td><td>0 [as-is]</td><td>15 [↑]</td><td>11/40/13/45 [as-is]</td></tr>
</table>

Your goal is to find which combination(s) of the three above for each of the FTP connectors (e.g. option 2 for FTP_S and option 3 for FTP_T) that the current NGCA has makes the cost <u>the cheapest</u>.</td></tr>
</table>

Task 2

The NGCA system has these nonfunctional property (NFP) global requirements:

- The response rate (number of responses / number of requests) **must be greater than 95%**.
- The average latency at the monitored interfaces **must be less than 40**
- The overall energy consumption **must be less than 10,000,000**
- The maximum memory use **must be less than 800**

<table>
<tr><th>Task Set #</th><th>Task</th></tr>
<tr><td>Task 2-1</td><td>The client company was hit by a huge financial downturn last year, and they desperately need to cut cost down. Unfortunately, the budget for their NGCA has been drastically reduced as a result. The problem is that they have continuously been paying license for the use of the two REST connectors that they implemented in the NGCA. They want to replace the connectors with cheaper ones while maintaining the minimum necessary throughput.
You did a thorough search with which cheaper connectors you could replace those connectors, and eventually found three with following characteristics:

<table>
<tr><th>Option</th><th>$/yr</th><th>Execution time of the Task forward in Process forwardResponse</th><th>Memory usage of the Task forward in Process forwardResponse</th><th>REST connector’s corresponding Host energy coefficients</th></tr>
<tr><td>1</td><td>1.1k</td><td>8 [↑]</td><td>10 [↑]</td><td>12/40/20/70 [↑]</td></tr>
<tr><td>2</td><td>2.3k</td><td>0 [as-is]</td><td>1 [as-is]</td><td>12/40/20/70 [↑]</td></tr>
<tr><td>3</td><td>2.1k</td><td>0 [as-is]</td><td>10 [↑]</td><td>11/40/13/45 [as-is]</td></tr>
</table>
Your goal is to find which combination(s) of the three above for each of the REST connectors (e.g. option 2 for REST_S and option 3 for REST_T) that the current NGCA has makes the cost <u>the cheapest</u>.</td></tr>
<tr><td>Task 2-2</td><td>It has been 10 years since the client company began using the legacy TempReqGen component in their NGCA. The client company is not satisfied with the rate at which TempReqGen can create and send requests, and they want to replace the component with newer ones.
You did a thorough search with which newer components you could replace TempReqGen , and eventually found three with following characteristics:

<table>
<tr><th>Option</th><th>Execution time of the Task generate in Process generateRequest</th><th>Memory usage of the Task generate in Process generateRequest</th><th>TempReqGen’s corresponding Host energy coefficients</th></tr>
<tr><td>1</td><td>5 [↓↓]</td><td>250 [↑]</td><td>50/200/65/240 [↑]</td></tr>
<tr><td>2</td><td>8 [↓]</td><td>3 [as-is]</td><td>50/200/65/240 [↑]</td></tr>
<tr><td>3</td><td>7 [↓]</td><td>250 [↑]</td><td>12/45/18/48 [as-is]</td></tr>
</table>
You goal is to find which combination(s) of the three above for each of TempReqGen (e.g. option 2 for User1, option 3 for User2, and option 2 for User3) that the current NGCA has makes <u>the most number of requests</u> in the given amount of time (2,500 units of time).</td></tr>
</table>

Discussion Questions

After the collaborative design session, in the HW3 report, discuss the following questions. Please note that there is no single right answer for each question.

1. How was the collaboration in general?
2. What were the challenges?
3. Which configuration (with or without proactive conflict detection) did you prefer, and why?
4. How many times did you run the XTEAM simulation in each session? Did the number change?
5. How many emails did you exchange with your partner in each session? Did the number change?
6. How do you think the collaborative design environment could be improved?