Course: Self-Healing System

Discussion on March 12, 2003

1) Why SHS?
   a) Rational
      • We can’t cover all possibility at design time. The traditional practice doesn’t work when the system become more complex.
      • Manual configuration just doesn’t scale as the system grows.

   b) What are the drivers?
      • IBM wants to eliminate the manual effort. It want to improve complexity management
      • The Moore’s law – Things cheaper and labor is becoming relatively expensive.
      • The further level the autonomic operations go, the variable costs are converted to fix cost.

   c) What is the different between Predictive and Adaptive
      • Predictive: SLA layer. Identify the problem but still can’t do automatic action. The analyst is required to fix the problem
      • Adaptive: SLA layer: the system automatically adapt itself

   d) What is the role of SLA : ?
      • It is use to describes the requirement for client ex. Latency
      • in Autonomic computing it concern with architectural agreement.
      • Requirement between user and provider. There is the technical requirement for example “The client can accept certain amount of down time to buy the service.
      • On the other hand, the provider may have the requirement to increase revenue (totally different).

   e) Matching SLA between Client and Provider
      ▪ Service bring out the contract
         • Provider provide level of service at different price)
         • Client provide the requirement how much he wants to pay for diff. Level of service

   f) What is going to be online and offline SLA?
      i. Offline is the codification part of SLA
      ii. Online is the agreement that need to be met during run-time

   g) What happen if some problem occur?
      i. Basic: human have to figure our what happen and fix it.
      ii. Manage: system tell what is the problem according the SLA
      iii. Predictive: system know the problem and suggest what to do
      iv. Adaptive: system knows the problem and able to fix it.
v. Autonomic: use the policy to optimize the entire cooperation. Use cost benefit analysis to make decision that effect across whole system.

As we move up we
- increase the scope of the analysis
- increase degree of automation
- ability to forecast and prepare for problem

In Autonomic is more abstract view.

2) What are the essential characteristic of a SHS?
   a) Four characteristic are orthogonal???
      i. Some system may have one but not another

3) What is the degree of correctness for self-healing system?

<table>
<thead>
<tr>
<th>Broken</th>
<th></th>
<th>Perfect</th>
</tr>
</thead>
</table>

4) What are important distinctions?

What are the underlying concern in distinct them?

<table>
<thead>
<tr>
<th>Self-Configuring</th>
<th>Self-Healing</th>
<th>Self-Optimizing</th>
<th>Self-Protecting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Look at thing outside in the future</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Internal & External Decision Making => Mechanism in achieving the objective.
- Proactive & Reactive
- Discrete & Continuous
- Environment included decision? Rainbow have the component that look at the whole system and do the adaptation when something’s wrong.

- Effect to Human user.
• External should have to different view of the system and uses it to make decision

System and Environment is quite clear distinction

5) Next Step
   a) Talk about architecture based adaptation
   b) Talk about foundation and Vocabulary related work like IBM.
   c) Look at Particular system and framework