M2R Info - AISSE - SEAS 2015-2016 Homework

DSL for Robconf and Extensions Proposals

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Context

Roboconf (http://roboconf.net) is a cloud orchestrator : it enables to create virtual machines in one or several IaaS cloud platforms and to deploy and run components of a distributed application. The description of the distributed application is represented in a DSL.

Homework

Step 1

The goal of the step 1 is providing

- the grammar
- an editor
- a checker

for the Roboconf DSL by using Eclipse DSL a.k.a. XText.

Step 2

The goal of the step 2 is providing a generator for the HTML5 graphic representation of a Roboconf file and nodes infoboxes. You can use Javascript libraries such as :
http://www.jointjs.com/
http://www.jgraph.com/mxgraph.html
http://js.cytoscape.org/
http://sigmajs.org/
http://philogb.github.io/jit/static/v20/Jit/Examples/ForceDirected/example1.html

Step 3

The goal of the step 3 is extending the Roboconf DSL in order to describe non-functional properties (in separate files according the principle of separation of concerns) and to add the notion of value types for attributes (ipaddress, ip4address, udpport, tcpport, dialnumber, url, httpsurl…). For instance, you will add ECA rules in order to specify elasticity for a set of type instances.
You can take inspiration from http://getcloudify.org/guide/2.7/developing/scaling_rules.html

You should choose between step 4a and step 4b.

Step 4a

The goal of the step 4a is providing a generator of the ACL : either for IPTables or for an IaaS you already know (AWS security groups, MS Azure NSG, Google Cloud Engine, ...). The ACL can be setted as files or as CLI commands (azure, aws, ...)
For that, you should add an extra-functional attribute that indicates if the machine is public and private (in the VPN)
http://msdn.microsoft.com/en-us/library/azure/dn376541.aspx
http://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/VPC_ACLs.html

Step 4b

The goal of the step 4b is providing a generator for the minimal Nagios configuration files for monitoring each VM and the components.
Nagios plugins are listed in https://exchange.nagios.org/

Defense instructions

- group of 3 students
- context (1 page) : about roboconf.
- 1 hidden slide for DSL
- 1 hidden slide for XText
- presentation of the grammar, extensions, (selected) rules
- presentation of each step
- software metrics : sloc, rules, test files (correct and erroneous) …
- faced problems
- feedbacks

References

LIG Report on Roboconf (in Moodle)

DSL
http://roboconf.net/en/index.html
http://roboconf.net/en/user-guide/roboconf-dsl.html

Tutorial with a simple LAMP deployment
http://roboconf.net/en/user-guide/lamp-example-part-1.html
http://roboconf.net/en/user-guide/lamp-example-part-2.html

Examples of DSL files
https://github.com/roboconf/roboconf-examples
https://github.com/roboconf/roboconf-examples/blob/master/apache-tomcat-webapp/graph/graph.graph