

From 0 to 100: Cloud Computing for the Non-Programmer

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ABSTRACT
This project will be demonstrating that it is possible to use and program a cloud within seven weeks, even though the student has no prior research and programming experience. The student will be faced with identifying what a cloud is as an abstract concept. The student will be exposed to an absolute minimum level in programming needed to program the cloud. Small programming exercises and lessons will be given to not only learn abstractly about the cloud, but will allow the student to experience using the cloud in a production setting. We will demonstrate that the student at the end of this period will be capable of using hundreds of virtual machines and controlling them from a program.

PROBLEM

- Is it possible to learn python in seven weeks?
- What would be good techniques to use?
- Will the average person reading a programming book be able to comprehend the book?
- What will be good advice if they are not able to comprehend the programming book?

METHODS

- So we need a student with no prior knowledge which was the author
- Read up on the information
- Take a test
- Make the program the scientist
- Write report
- Make poster

CONCLUSION

- He scored 80% on the practice test
- He was able to make the scientist life easier
- He will ask more question leading up to the problem
- Learning python in 7 weeks is possible
- He plans to continue learning python at his university

| Status | Name | Id |
|--------|----------------|--------------------------------------|
| ACTIVE | a2 | 317aa10b-96e8-4705-a725-2b6deccd8535 |
| ACTIVE | dmoney4454-001 | 59e5ee03-4e94-4265e8008eba1d3b460ba7 |
| ACTIVE | a1 | e0926229-b252-4cac-93a8-2e614ef0a2cf |

| | Goals | Outcomes |
|-----------|------------------------------------|--|
| Week 1 | Learn Python | Knowledge about lists, arrays, string, if, for |
| Week 2 | Learn Python What is a cloud | Learn classes Define Clouds |
| Week 3 | Interface with the cloud | Learn Python sh, get access to a cloud, program to start virtual machines and stop virtual machines via sh. |
| Week 4* | Collaborative Research environment | Communication of research results in paper and presentation, working with a team to do code improvements. Value of experts and when to contact them vs finding answers yourself. Repeat all things learned so far. |
| Week 5&6* | Fun WebGUI | Develop a nice WebGUI to display the status of my virtual machines in an HTML table using Cloudmesh. Do more advanced projects when done, such as displaying a graph with the times my virtual machines are running. |
| Week 7 | Report | Write a high quality technical report with bibliography about what was achieved. Clean up the examples and make them available in github. Provide a small introduction based on students point of view. Prepare a presentation summarizing the report. |
| | | |



CODE SAMPLE

```
def table(self, columns, name="__undefined__"):
    #columns = ["status", "name"]
    table_s = "<hr>\n"
    table_s += "<h1> My Cloud </1>"
    table_s += "<hr>\n"
    table_s += '<table border="1" cellpadding="10">\n'
    table_s += "\t<tr>\n\t\t<th>"
    table_s += "</th>\n\t\t<th>".join(columns)
    table_s += "</th>\n\t\t<tr>\n"
    for vm in self.vms:
        table_s += "\t\t<tr>\n"
        attribute_list = []
        for attribute in columns:
            value = self.vms[vm][attribute]

            if attribute == "status":
                if value == "ACTIVE":
                    color = 'style="background-color:green"'
                elif value == "ERROR":
                    color = 'style="background-color:red"'
                else:
                    color = 'style="background-color:blue"'

            elif attribute == "name":
                if value.startswith(name):
                    color = 'style="background-color:green"'
                else:
                    color = ""

            else:
                color = ""

        table_s += "\t\t\t\t{0}>{1}</td>\n".format(color,value)
        table_s += "\n\t\t</tr>\n"
    table_s += "</table>\n"
    return table_s
```

ACKNOWLEDGEMENT
1.Fox, G., G. von Laszewski, J. Diaz, K. Keahey, J. Fortes, R. Figueiredo, S. Smallen, W. Smith, and A. Grimshaw, "FutureGrid - a reconfigurable testbed for Cloud, HPC and Grid Computing", Contemporary High Performance Computing: From Petascale toward Exascale, April, 2013. Editor J. Vetter. [pdf] Contemporary High Performance Computing: From Petascale toward Exascale, April, 2013.
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