Systems Configuration and Administration with Puppet Scripts

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Abstract— The system configuration is the most important thing to any web developer, network manager, system admin, or even for any average user. We all love using our applications but the last thing one would want do is spend 6 hours setting the system up manually installing the applications desired on the system. Proper configuration of a system is must in case of big enterprise and even in small businesses because every hour of an employee wasted on setting up his system is more and more time lost which could have been invested in other important work. This is why automating the system setup is important in corporate world. In Windows, you can do this using Powershell and in Linux, you can do this using any of the vast number of shells available to interact with the kernel. I prefer Bash over other shells because it is a global standard for if not all but almost any linux operating system.

Key words: Systems Configuration, Puppet Scripts

I. Introduction

In Unix/Linux dotfiles refers to files/directories with a "." prepended to their name. Examples are ~/.bashrc ~/.bash_profile etc. The leading dot (.) is used as an indicator by software like bash and nautilus to not list these files normally but only when they are specifically requested like pressing Ctrl+H in Nautilus (file manager). This is because, generally, dotfiles are used to store configurations for different applications but they are sometimes used otherwise as well. For example Mozilla creates a .mozilla folder which contains their configuration files as well as browser cache. Here I have created a dotfile to configure my system according to my requirements.

II. Aim of the Study

- Automating my system setup
- Learning Shell Scripting
- Presenting how different programs can interact with one another

III. Literature Survey

CM tools are not the only option to automate or modularize configuration of system landscapes. This may also be achieved by writing custom scripts that automate configuration tasks. As CM tools are used for automating the installation and configuration of application components on nodes, configuration management and deployment management are often used synonymously. As today when everyone has the shortage of time then it is difficult to someone to give 5 to 6 hours to install and update the system this is why this scripts can easily and quickly update the system whenever there is need.

IV. Research Objectives

- Exploring the power of Linux
- Saving time spent on system configuration from scratch
- Automating all manual tasks and making high level aliases and functions to do repetitive tasks that take long commands to type.

V. Research Methodology

I started with learning basic Linux commands and reading man pages (although they didn't help in the beginning, online communities helped though) then I created my first alias in Linux in the ~/.bashrc file (I realized later it was not a good way). Slowly and gradually as I learned about more utilities, and wanted to make aliases of everything, I realized I cannot make alias of everything, although I can make a function for it. Then I wanted to automate installation of all the utilities from the package manager and clone multiple projects from Github; I learnt loops in this process. Then as my program grew, it became unmaintainable day by day so I split my program in separate files in order to better organize my files. As the requirement to get specific details from files and command outputs grew, I learnt regular expressions and got better at text processing with time. Where ever I didn't have an answer, the internet helped, for direct help, forums helped a lot.

VI. Related Work

As of the date of writing this paper, there are hundreds of dotfiles available online to work with. Almost anyone having knowledge of shell scripting can make a dotfile for himself or learn from the available dotfiles written by others. Github is a really nice source for this. The most important thing that would bother anyone going this way would be writing their own regular expressions. A regular expression, regex or regexp (sometimes called a rational expression) is, in theoretical computer science and formal language theory, a sequence of characters that define a search pattern. Usually this pattern is then used by string searching algorithms for "find" or "find" and "replace" operations on strings. Regular expressions are used in search engines, search and replace dialogs of word processors and text editors, in text processing utilities such as sed and AWK and in lexical analysis. Many programming languages provide regex capabilities, built-in, or via libraries.

VII. Applications

- Concept to reduce/expand computing resources based on current/scheduled workload.
- Quick set up of many hosts in a university network.
- Very fast and easy to install.

– Many industries can use this scripts so that it quickly and continuously update the system whenever there is need.

VIII. Result

The final result is conclude from this experiment is when I need to update my system then this scripts help me a lot and also by having this scripts in my System, it also saves my system for being crash many times as it automatically Update the system needs even not in my presence.

IX. Conclusion

A vision is to be able to have a non-technical configuration management, where services can be orchestrated together with the ease of a mouse click. In practice, this vision is addressed from different perspectives: puppetlabs announced orchestration functionality (puppetlabs.com/puppet/puppet-application-orchestration-news) for their tool. But, for this purpose also specific PaaS offerings exist. It conclude that many more systems at the same time can easily be updated and even in the crash condition they can be quickly operated with the help of puppet scripts.

X. Future scope

The scope of the project is that it is scalable to enterprise levels. It is extremely useful whenever a company or an enterprise needs to set up hundreds or thousands of systems in their offices the same system working environment or operating system at the same time (the same also applies to servers in a server-farm). Then at these levels they use the puppet to script and use dotfiles (configuration files) like mine to set up one system (master) which can push any scripted code to any number of client systems (aka slave) and which will also execute themselves simultaneously.

A puppet script for this project would be able to automate parallel system configuration with latest updates on all machines on a single network. This would help me push any new update in my project to all the machines on the network configured to run the puppet daemon. This script would also enable me to setup a server farm in a fraction of the time it takes to setup each server individually.

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