The Application of DevOps in Campus Area Networks

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Contents

1 Executive Summary

This document serves as a proposal in order to adopt a DevOps approach to managing the network infrastructure for the College of Science, Technology and Applied Arts of Trinidad and Tobago.

1.1 What is this proposal about ?

1.2 What this solution does not cover and why it is not covered ?

2 Introduction

2.1 Client Background

The client COSTAATT is a public tertiary institution in Trinidad and Tobago that offers programs in the areas of Information Technology, Business and Nursing, just to name a few.

The solution proposed can be applied to all types of organizations with large scale networks as it is aimed towards addressing the management of a large topology with limited human resources. The reason COSTAATT is an ideal candidate for this solution is because of their vast amount of networks and network devices that span multiple campuses across Trinidad and Tobago.

2.2 Problem

Improved uptime and network availability is required due to the rise in the reliance and implementation of cloud based services in the organization. Many critical services such as file sharing, active directory and email services which was originally on premise is now being hosted in cloud based platforms or being migrated. This means that high availability fault tolerant networks have become a necessity in order to ensure consistent access to these core services.

2.3 Cause of the Problem

The traditional way of managing the network has led to longer turnaround times with regards to network troubleshooting, and scalability when making changes in the network to accommodate new devices or applications. This causes a halt in productivity as well as growth in the organization when they attempt to integrate new services.

2.4 Aim

Implement a DevOps solution that enhances the management of COSTAATT's network which will improve system uptime and increased productivity for the organization. The solution contributes to productivity because automating repeatable or time consuming tasks will allow IT operations to concentrate on projects geared towards optimizing performance.

2.5 Evaluation

The delivery of the following components will determine the success of this project.

Build a network topology that is up to standards with regards to security and guidelines of Campus Area Networks. I will be relying on the NSA's Network Infrastructure Security Guide as well as Cisco's guide on implementing Campus Area Networks.

The devices must be communicating successfully with one another. We can use simple ping test in order to determine this.

The Ansible framework must be able to communicate with all devices that support SSH and I should be able to push configuration changes to all devices successfully. Ansible has built in features that indicate if you have successfully pushed configurations to a device.

Hypothetical scenarios will be introduced into the environment such as device or link failures and we will utilize the tools that we implemented to quickly recover. Failure to recover within an acceptable time frame will determine if the solution is fault tolerant. We want to recover within minutes. Examples of mass configuration changes will be carried out to test the efficiency of using Ansible.