JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue

JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Automation of Multiple PCs Using NLP and Slack API

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Abstract: Automation has taken a larger stance in technology. Thus, we intend to propose a collaborative platform and automation that lets a person plan, track, and manage the processes, content, and individuals that are connected to the network. This will be beneficial for the individuals who manage the network system. Also, this will allow all types of activity alerts to be fed directly to Slacks channels, making it easier for the network manager to remain informed and communicate with others when certain events take place in a centralized system. The idealistic notion is to ease the work of the network controller and to optimize the automation system and seemingly improve its accuracy.

Index Terms: Slack API, Automated workflows, Centralized System, Collaborative platform, Natural Language Processing, Machine Learning.

I. INTRODUCTION

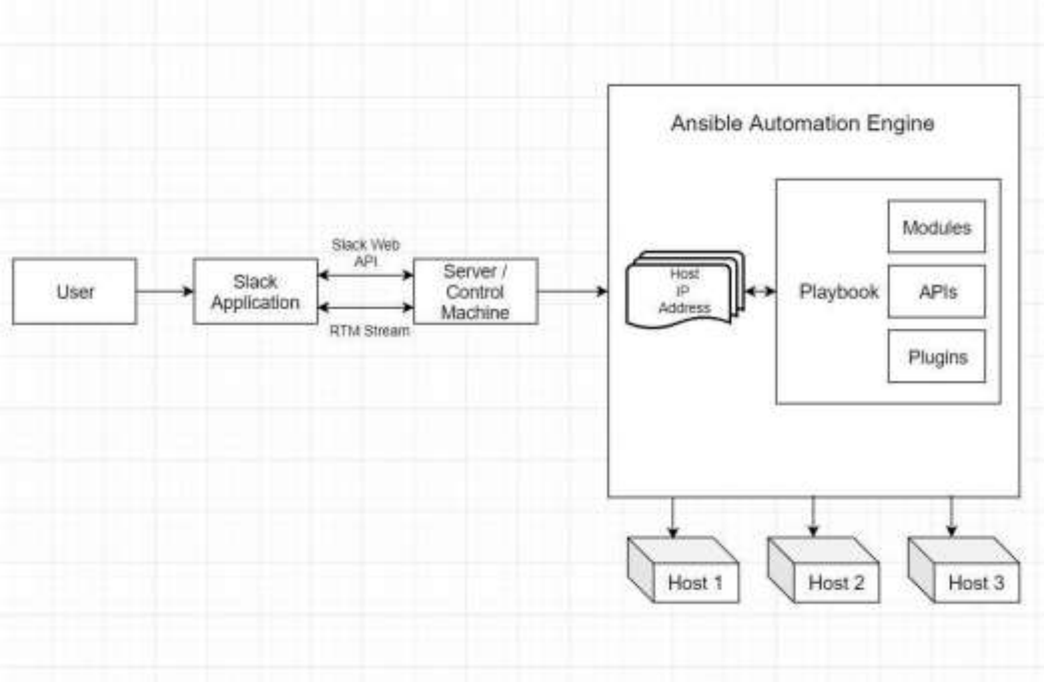
Automation is the technology by which a process or procedure is performed with minimal human assistance. We are building a centralized Slack API based application to manage automation tasks on interconnected PCs. The parsing for user level queries will be done through Natural Language Processing (NLP). These queries must be interpreted on respective individual PCs and sent it onto the job queue for automating the task. The detailed result of the task performed will be reverted back to the user device.

The main objective behind this application is to provide ease in team collaborations and reduce human efforts. Our project will bring a new level of comfort especially when there are a number of computers connected to a server. For example, lab assistants will not have to manually shutdown each computer, rather they will instruct using the Slack app to shut down all PCs of a particular lab. This provides a different, better and a simpler approach to deal with automating computer related tasks in a particular organization.

The application provides a perfect place for any organization or a team to chat, discuss, maintain records in forums, schedule activities, and as well as chat with our Bot, which is responsible to automate each task, right from shutting down , restarting, monitoring and troubleshooting, to file handling, installations, etc. It will be beneficial in each and every aspect in an organization.

The literature survey showed various applications working on similar technologies. In "Bringing Automation to the Classroom: A ChatOps-Based Approach" they present the design and implementation of a chatbot-based virtual assistant called LTKA Bot. Its main function is to streamline and to automate manual and administrative tasks while supporting other course related activities. It differs from other recent approaches in that it is based on the ChatOps paradigm instead of on some AIbased schemes. In "Faheem : Explaining URLs to people using a Slack bot" it has been presented as a Slack bot, named Faheem, which assists users in identifying potentially fraudulent URLs while also teaching them about URL reading and common malicious tactics. Study in "Can slack curb slacking?: Examining the importance of team communication in reducing social loafing" examines how the use of a team communication application, Slack, influences communication quality and social loafing.

II. PROPOSED METHODOLOGY

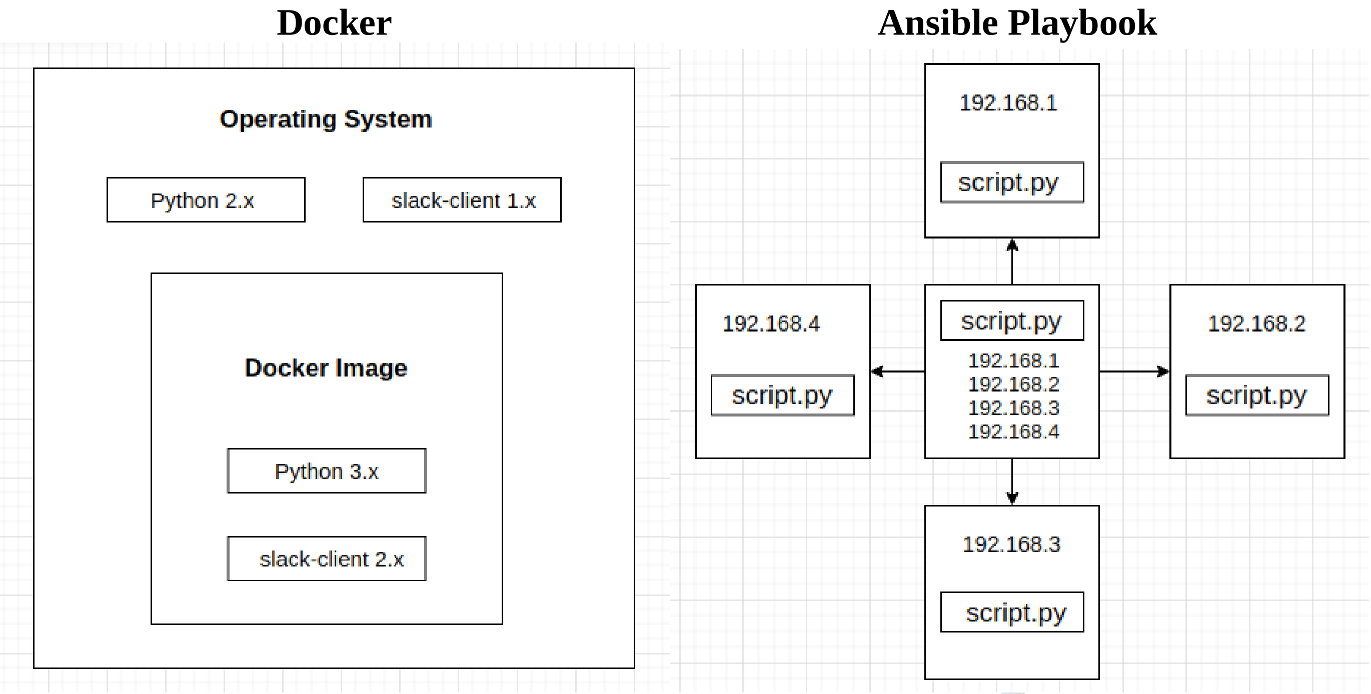


System Architecture

The proposed architecture of the system primarily comprises of three main components:

1. User - interacting through Slack Application
2. Server / Control Machine enabled with Ansible
3. Host PCs

The user must have Slack Application installed on their device. A dedicated slack channel must be chosen that will behave as the job queue for the automation tasks. The user will interact with the Server / Control Machine through this channel. User level queries will be processed with the help of Natural Language Processing and Machine Learning techniques. The slack automation scripts will be executed on multiple network systems using Docker and RedHat Ansible. Docker will contain docker images which will help in maintaining and isolating the configurations of the application script libraries from the individual machine's configuration. Ansible Playbooks can be programmed to connect multiple PCs on a network. A single host machine can interact with different guest machines and execute automation scripts through SSH scripting. The docker image and Ansible Playbooks can be visualized as:



Docker and Ansible Usability in the Application

Users can request for performing certain actions by interacting with the dedicated slack channel through natural language commands. Some of the commands can be to shutdown / restart all PCs or any individual PC. The user will need to specify the IP address of the PC that needs to be shut down. Users can also grab a process log file on any individual / multiple PCs. The process log file of the PC will be sent as a text file on the user's mobile device. The user can also send / receive images and videos from /

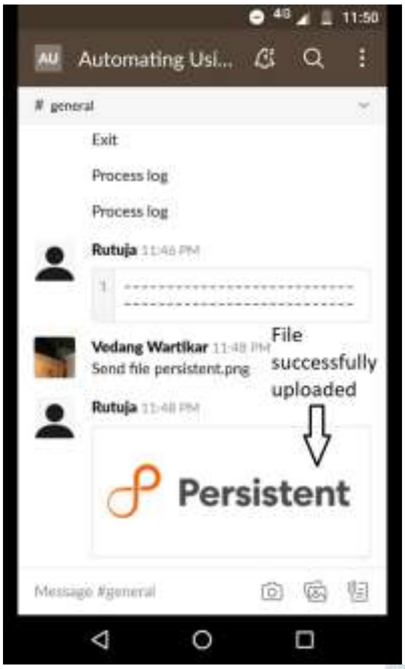
to mobile device and any specific PC. The user can also get information about the history of the slack channel which includes all the messages along with their timestamps. All of these functions can be initiated using real time python-slack libraries.

Some of the third-party python libraries required for this automation are:

1. slack (Provides an interface between slack API and python)
2. psutil (Process utilities)
3. requests (Interacting with the HTTP protocols)

III. RESULTS

Send Image



Exit

Process log

Process log

Rutuja 11:46 PM

```
1 ----------------------------
  ----------------------------
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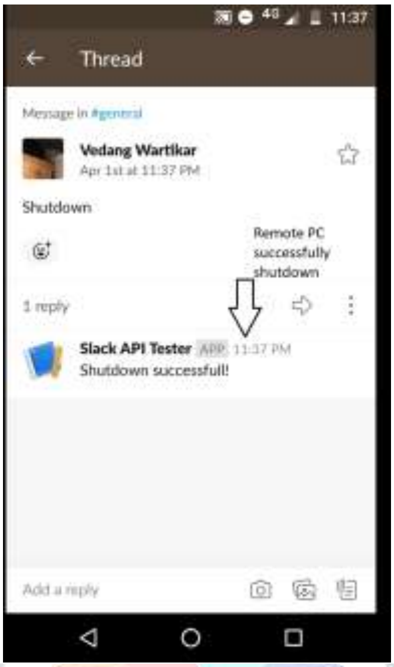
Vedang Wartikar 11:48 PM
Send file persistent.png

Rutuja 11:48 PM

File successfully uploaded

Shutdown



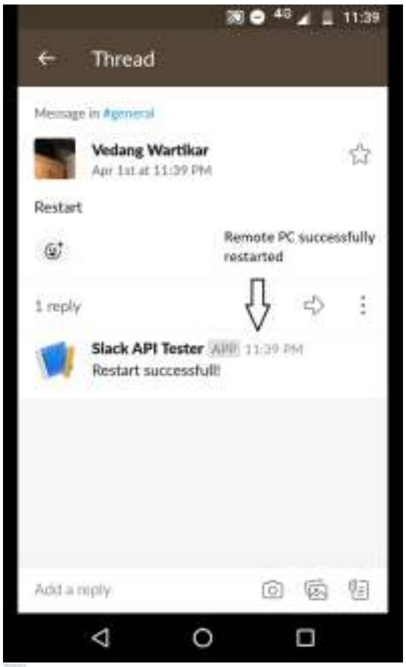
Message in #general

Vedang Wartikar
Apr 1st at 11:37 PM
Shutdown

Slack API Tester APP 11:37 PM
Shutdown successfull!

Remote PC successfully shutdown

Restart



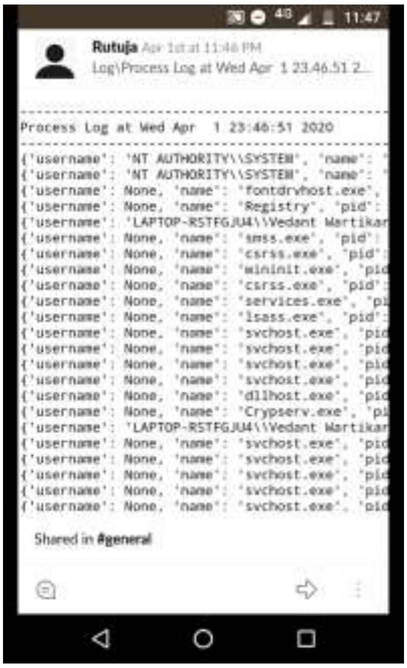
Message in #general

Vedang Wartikar
Apr 1st at 11:39 PM
Restart

Slack API Tester APP 11:39 PM
Restart successfull!

Remote PC successfully restarted

Process Log



Rutuja Apr 1st at 11:46 PM
Log\Process Log at Wed Apr 1 23.46.51 2...

```
-----------------------------------------------
Process Log at Wed Apr  1 23:46:51 2020
-----------------------------------------------
{'username': 'NT AUTHORITY\\SYSTEM', 'name': '
{'username': 'NT AUTHORITY\\SYSTEM', 'name': '
{'username': None, 'name': 'fontdrvhost.exe',
{'username': None, 'name': 'Registry', 'pid':
{'username': 'LAPTOP-RSTFGJU4\\Vedant Wartikar
{'username': None, 'name': 'smss.exe', 'pid':
{'username': None, 'name': 'csrss.exe', 'pid':
{'username': None, 'name': 'wininit.exe', 'pid
{'username': None, 'name': 'csrss.exe', 'pid':
{'username': None, 'name': 'services.exe', 'pi
{'username': None, 'name': 'lsass.exe', 'pid':
{'username': None, 'name': 'svchost.exe', 'pid
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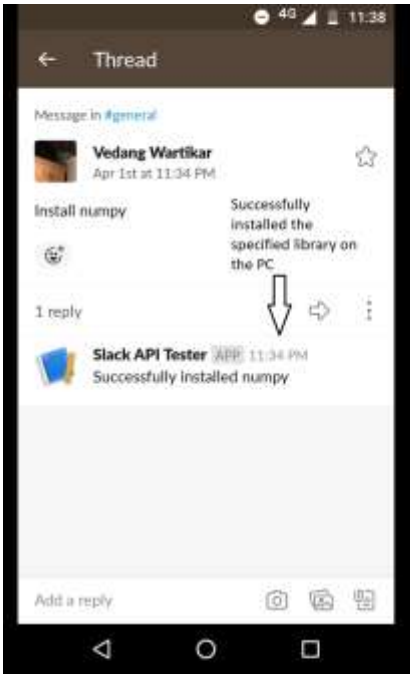
{'username': 'LAPTOP-RSTFGJU4\\Vedant Wartikar
{'username': None, 'name': 'svchost.exe', 'pid
{'username': None, 'name': 'svchost.exe', 'pid
{'username': None, 'name': 'svchost.exe', 'pid
{'username': None, 'name': 'svchost.exe', 'pid
{'username': None, 'name': 'svchost.exe', 'pid
```

Shared in #general

Install library



Message in #general

Vedang Wartikar
Apr 1st at 11:34 PM
Install numpy

Slack API Tester APP 11:34 PM
Successfully installed numpy

Successfully installed the specified library on the PC

This application mainly consists of automation script using Slack API libraries which can parse human-understandable queries into machine-understandable queries and execute the desired task on multiple target PCs. This will make it possible for every network administrator to conveniently use the application. It can be utilized in client-server architecture. It can also collaborate many computer labs connected to a single server which will help in maintaining data security and integrity.

IV. Conclusion

This application mainly consists of automation script using Slack API libraries which can parse human-understandable queries into machine-understandable queries and execute the desired task on multiple target PCs. This will make it possible for every network administrator to conveniently use the application. Thus, it can be utilized in client-server architecture and can collaborate with many computer labs connected to a single server which will help in maintaining data security and integrity.

V. Acknowledgement

We would like to thank our Project Guide, Assistant Prof. Pradnya Mehta and our external guides, Mr.Jaidev Karanth and Ms.Bharati Patidar from Persistent Systems, for providing technical inputs that helped build the foundation of our project. This work was also supported by our college, MMCOE which provided us various facilities that helped accelerate the development of our project.

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