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| <b>INTERNAL</b> |                        | Date: 4/16/18 |  |
| Document Ref.:  | Proposed CMDB Solution | Version: 1.2  |                                                                                     |

|                    |                                      |
|--------------------|--------------------------------------|
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| Distribution       | Release and Configuration Management |

### Introduction

The proposed Configuration Management Database Solution management will assist in:

- a) Deployment Automation
- b) Release Control
- c) App Release Automation and Configuration Management

All these are to help in Continuous Delivery, Deployments and Integrations.

### Current Available Workflow

The current set-up involves scripting individual files for each market and manually deploying them during implementation of new releases.

### Proposed Workflow

The new solution will involve automation of the configuration files and DB scripts management.

All new configurations will be setup in the CMDB and continuously deployed automatically on each new release.

### Pre-requisites

1. Knowledge of the configuration variables for each application
2. Knowledge of the config variables for each market
3. Each user will be registered by the admin account
4. Apache Server to run the application
5. Relational Database

### Solution Architecture

The solution will be developed in PHP 5 and use MySQL database.

It'll run on a apache server hosted on a Linux environment.

The server IP needs to be whitelisted to link to the existing markets' production environments.

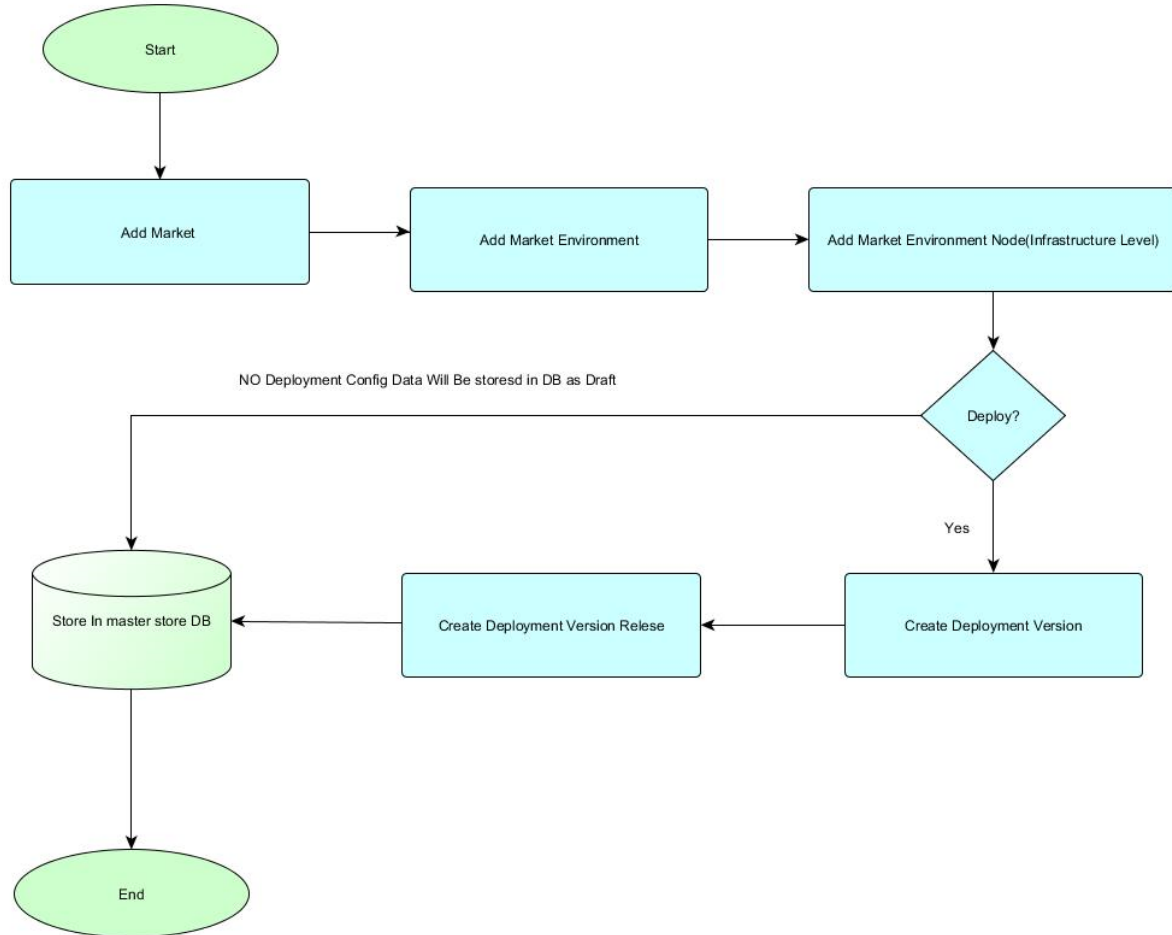
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| Feature               | Description                                                                | Technology                                        |
|-----------------------|----------------------------------------------------------------------------|---------------------------------------------------|
| System UI and Backend | This will render the view and allow the user to interact with the solution | PHP, python, JavaScript and HTML5                 |
| Database              | Store the data entered by the user                                         | MySQL                                             |
| Webserver             | Environment to run the application                                         | Apache and Linux Server 16.02<br>192.168.3.64:992 |

#### Proposed Modules

- User Management
- Markets Management
- Environment Management
- Infrastructure Management
- Release management

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## Handling Scripts

**Nb: \*\*** all config files generated by CMDB will be stored in the /data/<market>/<app>/ directory

PHP will handle bash scripts using a main scripts class using get action method for each action desired for example:

\$ POST['action']= deploy\_script

A sample URL would be:

*http://<ip:port>/mode\_cmdb/executescripts.php?action=deploy\_script&&market\_id=1&&environment\_id=2&&node\_id=13*

This will open an ssh connection by checking the

- Action specified to check the class section
- market variable id from the db. using requested variable
- environment variable id from the db. using requested variable
- node variable id from the db. using requested variable and get the node IP and port for access.

**Nb: \*\*** we intend with CAB approval to have our custom scripts that will run the selected intended actions under the: **\*\*\*** directory

Actions include:

- Deploy
- Rollback
- Error Checking
- Data\_market\_dir creation (to house the different config files created)

This will in turn run a script which will scp into the server where the CMDB application runs under /data/<market>/<app>/f<filename.config> and copy the file to the /temp/release/directory of the node machine.

The script mv the current config file in the node machine into the deprecated folder and renames the file using the set standard.

The script copies the file we stored in the temp folder into the config folder

The application is restarted and the connection closed. An email is sent to the stakeholders to notify of the deployment with the timestamp noted.

The script invokes a call to the error checking action that can be defined as:

*http://<ip:port>/mode\_cmdb/executescripts.php?action=error\_monitor\_script&&market\_id=1&&environment\_id=2&&node\_id=13*

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This will initiate a new connection to the node machine via ssh and query the log file

- E.g.: `tail -n 100 <path to log file > | grep Error`
- This will check any occurrence of an error and echo the error on our UI.
- If an error occurs the rollback is performed and the new file is removed.
- The file we moved to the deprecated folder is moved back to the config folder
- The application is in turn restarted
- An email is sent informing concerned stake holders of a successful rollback.
- If no errors are encountered we run a script every 5 minutes to watch the error logs and if none an email is sent to notify of a successful deployment.
- For successful deployments the config file under the /temp/release/ folder is immediately removed.

### Access rights

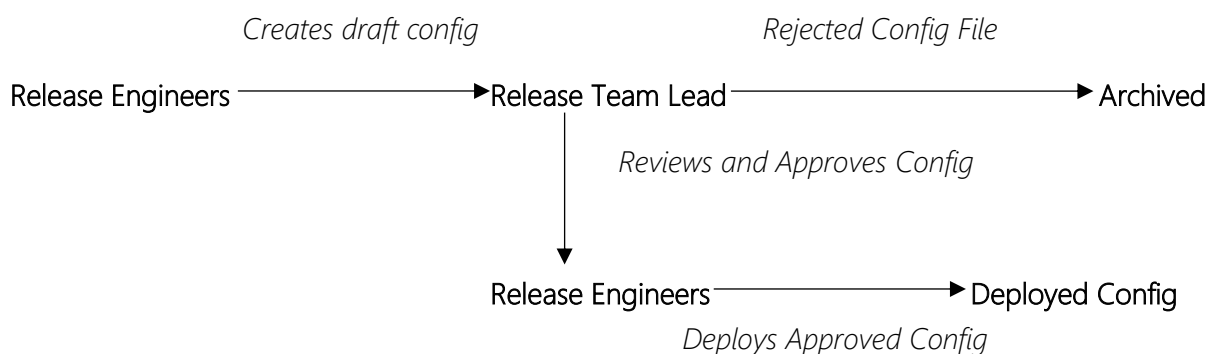
The system will have role based access levels where each user will be required to provide a username and password to access the system.

### Security

To ensure that the system is secure and can't be accessed by unauthorized people, it will only use post requests. Session control will be on both server level and browser level. A user's session will be in relation to his activity on the server. If the system detects inactivity for some time, it will log the user out. He will then be required to log in to the system from the browser.

### Control

For all configurations to be deployed or accepted as the standard for each version release they need approvals from all concerned stakeholders.



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The config Files will be classified into 5 states:

- **Draft** -this is the un-approved version of a release config
- **Approved** – This the stage once a file is approved by the release team lead
- **Deployed** – This is the current active and deployed file in the concerned environment
- **Void**- This is a draft config that has been rejected for deployment
- **Archived**- This is the deprecated config files of earlier release versions

### Versioning

Before a release config file is deployed we will use a custom version control standard to control versions and releases

Version Standard: 1. ,2. ,3.

Release Standard: .01, .02,.03

Deployed File Standard in full will be: 1.02 For example

Release description: **either a release is stable or unstable**

Logs will be stored in the database stating the changes that have been done, time it was done and the version attached to the changes.

### Rollback

This will be done if an error occurs. The system will allow the user to reset the releases to the last known stable version from the database. After a rollback takes place, an email is sent to all the concerned stakeholders showing that a rollback happened and to which version it was rolled back to.

### Error handling

The system will analyze the error logs to know if there any errors or not. If there are errors, the system will echo the errors and alert the user to take the necessary action e.g rolling back. If there are no errors, the system will allow the user to continue with the deployment.

### Outline of the categories of deployments

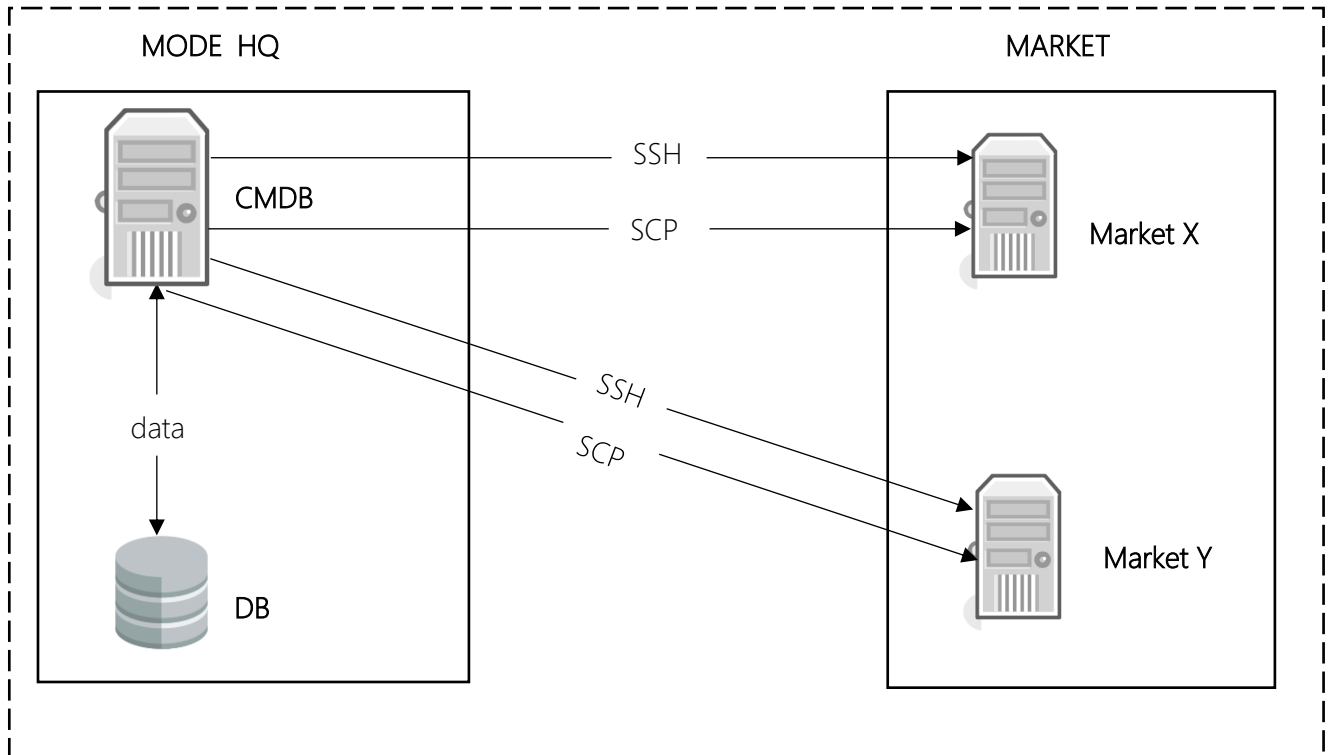
The system will help in automation of the configuration files versioning and in deployments of the configuration files that are approved into production nodes.

The deployment process is already defined above in the [control section].

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## High level diagram

### Tunnel markets



### VPN Markets

