

Design Decisions - Q2 Assignment 1

- The `clustershell_client` is run on one controlling machine and `clustershell_server` is run on all other nodes.
- The **config** file is given to the `clustershell_client` as a command line argument.
- The config file has the following format

```
<Number of remote nodes>
<node1 ip> <node1 port>
<node2 ip> <node2 port>
.
.
<nodeN ip> <nodeN port>
```

Example:

```
2
172.17.54.63 8081
127.0.0.1 8082
```

- Mapping of the form
`n1 -> ip1:port1 ; n2 -> ip2:port2 ...`
is assigned based on the order of data in the config file. The first ip and port is given the name `n1`, the second is given the name `n2` and so on.
- **cmdstruc** is a structure that holds details about a command. It has following structure,

```
struct cmdstruc{
    char *cmd;
    char *inp;
    char **args;
};
```

To execute a command on a remote machine, a **cmdstruc** is encoded as a string and is written to the socket. The format of this string is

```
<cmd>#<inp>#arg1#arg2...
```

Example:

```
ls
wc#this is sample text
echo#null#this will be echoed
```

- Encoded string is converted back to **cmdstruc** on a remote machine.
- “**null**” is used in place of <inp> when there are arguments but no input for a command.
- “**stdin**” is used in place of <inp> when the input to the remote program is to be given using the standard input from the terminal.
- The client application creates a socket for each of the nodes in config file and tries to establish a connection during the startup. If connection to any of the server fails, it is reported by the client.
- **n*** type of commands executes the given command on the local machine as well as all the remote servers.
- Initial working directory for every server and client is set as the **home directory** of that machine.
- **exit** command is used to exit the client application. It also closes all the sockets.
- **nodes** command gives a list of mapping for connected server nodes.
- Extra leading and trailing spaces are automatically trimmed.
- The shell assumes that the user enters only valid commands.