It Is Just an Operating System!

(Instructor Version)

Instructor Note: Red font color or Gray highlights indicate text that appears in the instructor copy only.

Objectives

Describe the command structure of Cisco IOS software

- Students will recognize that text commands that are used in command line interfaces are intentionally chosen from spoken language. Text commands are often abbreviated, or otherwise simplified in their syntax, to keep the resulting command set concise. They may be grouped into context modes that simplify their usage. Configuring a device using written commands is similar to giving out short orders verbally. The commands are executed by the operating system and the actual process is performed by the device.

Background / Scenario

Imagine that you are employed as an engineer for a car manufacturing company. The company is currently working on a new car model. This model will have selected functions which can be controlled by the driver giving specific voice commands.

You must design the set of commands used by this voice-activated control system.

The functions of the car that can be controlled by voice commands are:

- Lights
- Wipers
- Radio
- Telephone set
- Air conditioning
- Ignition

Your task is to devise a simple set of spoken commands that will be used to control these systems and identify how they are going to be executed.

Instructor Note: This Modeling Activity is not intended to be a graded assignment. Its purpose is to help students reflect on their perceptions of how a network is set up using voice commands (much like the IOS command structure). Facilitation of the discussion should include student-to-student discussions of each other's work.

Required Resources

- Paper and pencils or pens, or computer

Reflection

1. How can devising a set of voice commands assist in operating a vehicle? How could these same commands be used on a computer or network operating system?

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Some suggested answers for discussion include:

- Discuss that the options for putting together a set of spoken words will constitute the command set. An obvious choice is using simple English words as the command set. Other choices include words in

different languages, using command numbers or shortcuts. Note, however, that this would make the command set significantly less intuitive.

- Talk about the students' choice to make the command set direct, without hierarchy, or whether they grouped commands according to their function. Highlight that, for example, a help command without any further context would not be usable because it does not indicate what exactly the user needs help to. There are two ways of providing a context to a command:
- Ask students if they explicitly expressed the context with each command (for example, radio volume up/radio volume down; phone volume up/phone volume down) which is the direct, flat approach. Or did they introduce modes; groupings of commands that refer to a particular context and once positioned in that context, did not have to be reemphasized., For example, after placing the instruction in the radio mode, the commands volume up and volume down are unambiguous.
- Discuss the advantages of both approaches. For a small set of commands, the direct approach is more suitable. For a larger set of commands which may possibly grow into extensive, multi-word sentences, using modes helps to keep the command set organized and limits the length of individual commands, and is preferred.
- How did students decide how the voice command recognition would be started so that the car did not mistakenly interpret a casual conversation of passengers as commands? Possibilities include saying a specific, otherwise unused word, or pressing a button on the steering wheel. Also, discuss how students handled a system that should prompt the user to enter the voice commands, and how the user would be informed that the spoken command was not properly understood or valid.
- How did the students handle access to more safety-critical commands such as lights and ignition?)How were these commands protected or isolated so that no inadvertent manipulation could occur? Possibilities include saying a specific, otherwise unused word, or pressing a button on the steering wheel.
- Ask students to discuss which part of the software running on the car's built-in computer would be processing the voice commands and what software would be actually executing the commands. The software that performs speech recognition and translates voice commands into a form the computer can understand is the command interface used to interact with the car. However, the commands need to be processed by the central operating software of the car that controls all its functions and orchestrates all its systems. As an example, saying "engine on" involves processing the voice command in the command interface, and then the operating system processes this command by activating the starter motor for a certain period of time, enabling the flow of the fuel, etc., coordinating multiple systems of a car to make it work.

Identify elements of the model that map to IT-related content:

- Different systems of the car which can be controlled by voice commands relate to different components of routers and switches that can be configured.
- Vocal commands relate to IOS commands
- The choice of short English words or phrases as the command set relates to the general style of IOS CLI.
- The mode-oriented organization of the voice command set relates to the mode-oriented IOS CLI.
- Starting the voice recognition process relates to starting a CLI EXEC session by pressing Enter. Also, the voice prompts by the car relate to the prompts on the command line.
- Potentially disruptive commands, such as lights off or engine on relates to potentially disruptive IOS commands (reload, erase flash: or delete startup-config).
- The voice interface and the car's operating system relate to the IOS EXEC (the command interpreter) and the IOS itself.