BC-isit442 Class Overview And Structure

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This Document is Available on-line at:
http://mohsen.banan.1.byname.net/PLPC/120048

Mohsen BANAN
Email: http://mohsen.1.banan.byname.net/contact

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Basics Of Bash Scripting

1 History Of sh, ksh and bash

History Of sh, ksh and bash

- Bourn Shell
- Korn Shell 88, Korn Shell 93
- The IEEE 1003.2 POSIX Shell Standard
- Bash 4
- Dash

2 Can Bash Be Considered A Complete Programming Language?

- Scoping is almost all there
- Integer Arithmetic Is Now Native
- Associative Arrays Are In Place

Library Support/Richness?

From a certain perspective all of unix commands can be considered Bash's library, but that is different from language libraries

There is a lot that can be done in Bash. Beyond that switch to Python.

3 Consider Getopt

- What is getopt?
- Examples of hiding getopt in bash libraries

4 Bash's Minimalist Approach Vs The Framework Oriented Approach

- Sometimes self-contained scripting is the right approach
- Sometimes you need a framework to build on

We will be experimenting with both approaches.

5 Bash Based ByStar Interactively Invokable Modules (Bash IIMs)

Bash Based ByStar Interactively Invokable Modules (Bash IIMs)

ByStar IIMs are scripts that consistently:

- Meant to also be invoked interactively.
- Encapsulate well defined functionality with in a single script (BinsPrep, Manage, DaemonAdmin)
- Actions are invoked with "-i"
- Parameters are communicated with "-p name=value"
- Universality of "-v" "-n showRun"
- All standard capabilities is hiden from individual modules
- Bash IIMs can then be augmented by IIM-Bash-Panels

Part II

Init System Of Our Unix Universe

6 System V Init System

System V Init System

- Run Levels
- /etc/init.d Directory
- A look at an example init.d script: start/stop/status

7 Daemontools

Daemontools

Benefits of Daemontools:

- SysV Init is primarily monolithic and convention oriented
- Daemontools is compositional
- daemontools is a collection of tools for managing UNIX services.
- Let's Walk Through `https://cr.yp.to/daemontools.html`

8 File Variables As The Most Simple Control Method

File Variables As The Most Simple Control Method

Daemon Control Methods Considerations:

- Getopt
- Databases And Windows Style Registeries
- File Variables
- Environment Variables

Part III

Uses Of Accounts In Our Unix Universe

9 Abstractions Of Accounts In The Unix Model

Abstractions Of Accounts In The Unix Model

- Unix Accounts Are Reflected In /etc/passwd
- Each Account Has a UserId
- Each UserId Can Be Associated With Multiple Groups
- Each Account May Have A Shell – or No Shell
- Each Account May Have A Home Directory – Or No Home Directory
- Each Account May Have A Password Or No Password

10 Uses Of Unix Accounts

Uses Of Unix Accounts

Unix Accounts Can Be Used For Many Purposes:

- Allow Users To Login (very traditional)
- Track, Monitor and Limit (Bound) Activities Of Programs (traditional)
- Be A Basis For Storing Information/Data (not very common)
- Be A Basis For Authentication and Access Control For Programs (traditional)
- Be A Basis For Compund Abstraction (for example instead of databases)

ByStar Messaging System Makes Very Heavy Use Of Unix Accounts.

Part IV

Class Activities

11 Emacs As A System Administration Tool

11.1 More On Major and Minor Modes

- Walk Through Of Major Modes Panel
- Walk Through Of Minor Modes Panel
- Walk Through Of Emacs Survival Guide
- Walk Through Of Emacs Reference Sheet

11.2 Org-Mode

- Walk Through Of Org-Mode Reference Sheet

12 Bash Scripting – The Minimalist And The Framework Oriented Approach

12.1 Minimalist Bash Scripting

- touch ~/isit442/lastName-minimal.sh
- A simple standalone script reads its first arg as a filename.
- Checks to see if file exists
- outputs accordingly

12.2 Framework Oriented Bash Scripting

- cp /opt/public/osmt/bin/startIimGeneric.sh ~/isit442/lastName-iim.sh
- Add VisExample
- Add Describe
- Add Functionality

Part V

Assignments

13 Assignments

- Read through “man getopt”
- Page through `https://cr.yp.to/daemontools.html`
- Page through Bash Scripting Reference Sheet (Cheat Sheet)

- Write a simple standalone bash script that reads one argument (path to a file) if the files exists, it prints to stdout a message and exits with exit code 0, if the file does not exist, it exists with exit code 1 and prints to both stdout and stderr a message that the file does not exist. Call the script lastName-fcheck.sh. Email it to me by next week (Jan 26).
- Play with and enhance the actionIims.sh that we build in class.

- Read throuhg `http://www.by-star.net`
- Only dig deeper into its references if you want to
- Focus on the following sections: 4.2.1 “The ByStar Ref Model”, 4.3 and all 5.

References