

ByStar Messaging Platform Foundations

Daemontools, Djbdns

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Part I

Basics Of Bash Scripting

Part 1: Basics Of Bash Scripting

- 1 History Of sh, ksh and bash
- 2 Can Bash Be Considered A Complete Programming Language?
- 3 Consider Getopt
- 4 Bash's Minimalist Approach Vs The Framework Oriented Approach
- 5 Bash Based ByStar Interactively Invokable Modules (Bash IIMs)

History Of sh, ksh and bash

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

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.

Consider Getopt

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

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.

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 hidden from individual modules
- Bash IIMs can then be augmented by IIM-Bash-Panels

Part II

Init System Of Our Unix Universe

Part 2: Init System Of Our Unix Universe

6 System V Init System

7 Daemontools

8 File Variables As The Most Simple Control Method

System V Init System

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

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.yip.to/daemontools.html>

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

Part 3: Uses Of Accounts In Our Unix Universe

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10 Uses Of Unix Accounts

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

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 Compound Abstraction (for example instead of databases)

ByStar Messaging System Makes Very Heavy Use Of Unix Accounts.

Part IV

Class Activities

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 - More On Major and Minor Modes
 - Org-Mode

- 12 Bash Scripting – The Minimalist And The Framework Oriented Approach
 - Minimalist Bash Scripting
 - Framework Oriented Bash Scripting

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

Org-Mode

- Walk Through Of Org-Mode Reference Sheet

Minimalist Bash Scripts

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

Framework Oriented Bash Scripting

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

Part V

Assignments

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Assignments

- Read through “man getopt”
- Page through <https://cr.yip.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 file exists, it prints to stdout a message and exits with exit code 0, if the file does not exist, it exits 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 actionlims.sh that we build in class.
- Read through <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.