ESP Logging

5/29/24 Brent Roman brent@mbari.org

Types of ESP Log Files

- ESP logs usually written in `/var/log/$USER`
- All ESP logs named `$ESPmode.`*`type`*
- Where *`type`* is one of:
- `log` → Detailed binary log of all operations
  - use dumplog utility to context to text
- `out` → Text output to server's terminal
  - only if ESPserver run detached from terminal
- `puck` → Text log of 2G puck movements
- `slot` → Text log of 3G cartridge states

Detailed Binary Log

- Always records every:
  - method that changes an actuator’s state
  - message on the I2C bus
  - unhandled Exception (aka Error)
  - espclient session command
  - contextual sensor reading
  - camera image taken (description only)
  - email message sent

dumplog Converts .log to Text

- Requires ESP environment variables be set
  - for 2G: `$ . ESPenv shallow $ESPname`
    - [these already set if run on ESP itself]
  - dumplog is very slow when run on ESP
- Lots of options and examples
  - `dumplog --help`
    - dump only errors
    - dump only Can data
    - dump only data since a given time
    - ...

dumplog from your Linux Laptop

- best way to run dumplog is over the network
- Example:

```
curl -s http://ESPhostname/esp/real.log | dumplog | less
```

  - where ESPhostname is the name or ip address of your ESP
  - `less` is a text viewer that understands vi commands
  - insert any dumplog options after its name as desired
- But, I don't know vi commands...

```
curl -s http://eddie/esp/real.log | dumplog > real.txt
```

  - edit real.txt with whatever tool you like best
  - consider deleting real.txt when done
- But, my ESP is not on my local network

```
curl -s http://ESPshore.mbari.org/waldo/esp/real.log | dumplog | less
```

  - fetch the log from MBARI's espshore server
  - assumes your ESP is uploading to ESPshore.mbari.org

Optional .out text log

- Written only when started ESP with:

  `start esp ...`

- Records text that would have gone to terminal
- What's output depends on ESP's operating mode

  `$ESPmode` #won't see much in "brief" mode

- View with 'less' or any text editor
- or with any web browser at:

  `http://`*`ESPhostname`*`/esp/real.out`

  - or

    `http://ESPshore.mbari.org/ESPhostname/esp/real.out`

    - assuming that your ESP is uploading to ESPshore

2G ESP Puck Log

- Very terse text log of every puck movement
- Read by ESP on start
- Retains current source/startTube number
- Used to detect dropped pucks
- Confused by manually changing puck load

```
access tubeNumber #before adding/removing pucks
```

  - tells ESP to accept any change in tube

- For simulation

```
Storage.fill! #fills tubes 2..7 full with pucks
```

3G ESP Slot Log

- Very terse text log of cartridge state change
- Read by ESP on start
- Includes configuration data for cartridges
- Allow for reserving and releasing cartridges
- Records volume sampled by each cartridge
- Records lystate volume (if applicable)
- Configures error recovery policies
  - per cartridge type

Linux System Message Log

- Operating system log messages append to:

  /var/log/messages

- Automatically uploaded to ESPshore
- Contains critical debugging information
- Never delete these files!
- When these grows too large, truncate with:

  # >/var/log/messages #as root user

  # >/var/log/wtmp #binary log of all logins

- View with less or a text editor, or at:

  http://*ESPhostname*/messages #or

  http://ESPshore.mbari.org/*ESPname*/esp/messages

Tailing log files

- Tail is a Unix command that shows last lines of file
- It can also monitor a log file for updates
  - View the end of system log file, wait for new messages:

    ```
    $ tail -f /var/log/messages  #Control-C to exit
    ```

  - Monitor the ESP server's real.out text log:

    ```
    $ tail -f /var/log/esp/real.out #Control-C exits
    ```

  - Equivalent to:

    ```
    $ showlog  #Control-C exits
    ```

  - Show the last 100 lines of the simfast mode log

    ```
    $ ESPmode=simfast showlog -100
    ```

  - Lookup Unix tail command for info on showlog options:

    https://man7.org/linux/man-pages/man1/tail.1.html

Log Rotation

- Rotate after each season
- On your ESP, at the Linux shell prompt:
  - $ rotatelogs --help #displays instructions
- Example:
  - $ upsync #to ensure espshore is updated
  - $ rotatelogs 24may
    - Moves existing logs into a 24may subdir
    - Also moves them on espshore
    - Truncates kernel and system logs

Log Data Deletion

- If archived logs grow to fill your ESP's card
- To check card space:
  - $ df /var/log   #if "Use %" >70% or so...
- After log rotation, delete older log subdirectories
- On your ESP, at the Linux shell prompt
- Example:
  - $ upsync #to ensure espshore is updated
  - $ rm -rf /var/log/esp/21sep
    - Deletes previously rotated logs from 21sep
    - Ensure you have BACKUPS beforehand!
    - Don't rely on espshore for long-term archival