Logging and Syslog

Advanced Embedded Linux Development

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Learning objectives:
Logging and Syslog Overview.

Printf Debugging

- Print output is one of the simplest ways to troubleshoot and debug your application.
- The printf call works great for interactive programs.
- What about headless embedded systems?

Logging

- What about headless embedded systems?
  - Need some type of logging framework to store information in log files.
  - Syslog and syslogd (rsyslogd) is one such framework.

Logging and Syslog

- syslogd is a daemon which
  - Uses configuration file to configure logging (usually writing to files in /var/log)
  - Handles log messages from applications using syslog() API calls.

Syslog Usage

```
SYNOPSIS
        #include <syslog.h>

        void openlog(const char *ident, int option, int facility);
        void syslog(int priority, const char *format, ...);
```

- Facilities
  - LOG_USER
  - LOG_DAEMON
  - LOG_LOCAL0 to LOG_LOCAL7

- Priorities
  - LOG_ERR
  - LOG_WARNING
  - LOG_INFO
  - LOG_DEBUG

https://linux.die.net/man/8/syslogd
https://linux.die.net/man/3/syslog

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Syslog Usage

```
openlog(NULL,0,LOG_USER);
```

```
syslog(LOG_ERR,"Invalid Number of arguments: %d",argc);
```

● Results in message in /var/log/syslog:

```
Sep  2 08:36:01 ecen5013-VirtualBox anacron[825]: Normal exit (3 jobs run)
Sep  2 08:45:41 ecen5013-VirtualBox writer: Invalid Number of arguments: 1
```

Syslog Usage

- Log redirection in an Ubuntu VM happens based on rules in /etc/rsyslog.d/*default.conf

```
#   Default rules for rsyslog.
#
#                       For more information see rsyslog.conf(5) and /etc/rsyslog.conf
#
#
# First some standard log files.  Log by facility.
#
auth,authpriv.*                 /var/log/auth.log
*.*;auth,authpriv.none          -/var/log/syslog
#cron.*                         /var/log/cron.log
#daemon.*                       -/var/log/daemon.log
kern.*                          -/var/log/kern.log
#lpr.*                          -/var/log/lpr.log
mail.*                          -/var/log/mail.log
#user.*                         -/var/log/user.log
```

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