

# **Advanced Programming in the UNIX Environment**

## **Week 10, Segment 1: Dæmon Processes**

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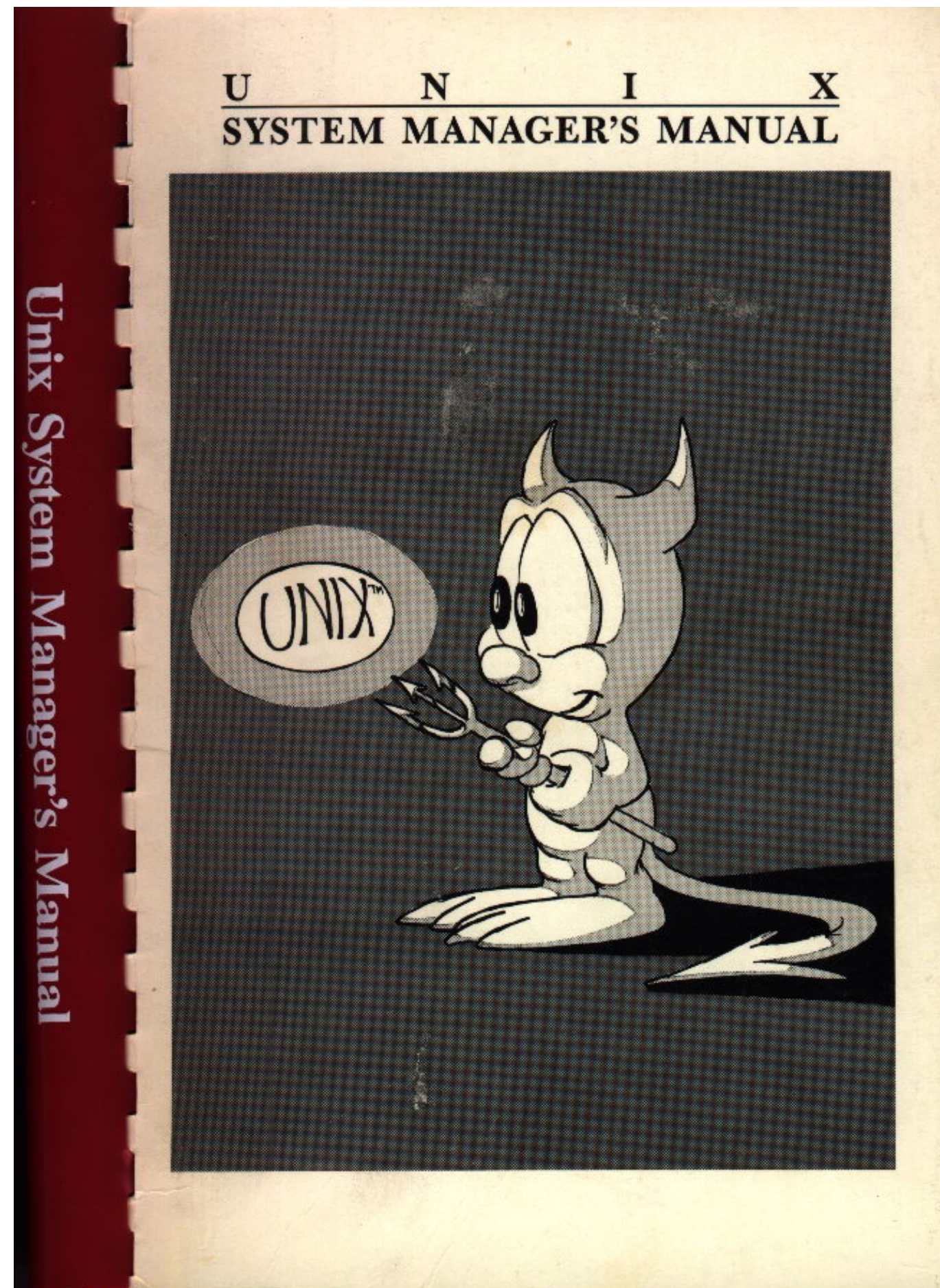
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`https://stevens.netmeister.org/631/`



# Dæmons

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## Dæmon Processes

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Commonly, dæmon processes are created to offer a specific service.

Dæmon processes usually...

- live for a long time;
- are started at boot time;
- terminate only during shutdown;
- have no controlling terminal.



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## Dæmon Characteristics

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The previously listed characteristics have certain implications:

- do one thing, and one thing only
- resource leaks eventually surface
- consider current working directory
- no (or only limited) user-interaction possible
- how to create (debugging) output



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## Writing a Dæmon

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- clear the environment
- fork off the parent process
- change file mode mask (umask)
- create a unique Session ID (SID)
- change the current working directory to a safe place
- close (or redirect) standard file descriptors
- open any logs for writing
- enter actual code



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## Dæmon Conventions

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- prevent against multiple instances via a *lockfile*
- allow for easy determination of PID via a *pidfile*
- include a system initialization script (for /etc/rc.d/, /etc/init.d/, systemd, ...)
- configuration file convention /etc/name.conf
- re-read configuration file upon SIGHUP
- relay information via event logging, often done using e.g., syslog(3)



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2179

```
[jschauma@apue$ ps waux | grep syslog
```

```
root      2179  0.0  0.2 33204 2308 ?        Ss      6:56PM 0:00.01 /usr/sbin/syslogd
-s
```

```
[jschauma@apue$ sudo vi /etc/syslog.conf
```

```
[jschauma@apue$ sudo kill 2179
```

```
[jschauma@apue$ sudo /usr/sbin/syslogd -s
```

```
[jschauma@apue$ ps waux | grep sysl
```

```
root      2410  0.0  0.2 32472 2280 ?        Ss      7:03PM 0:00.00 /usr/sbin/syslogd
-s
```

```
[jschauma@apue$ cat /var/run/syslogd.pid
```

2410

```
[jschauma@apue$ logger -p local0.notice "a local message"
```

```
[jschauma@apue$ cat /var/log/local0
```

```
Nov  7 19:03:57 apue jschauma: a local message
```

```
[jschauma@apue$ sudo vi /etc/syslog.conf
```

```
[jschauma@apue$ /etc/rc.d/syslogd start
```

```
syslogd already running? (pid=2410).
```

```
[jschauma@apue$ sudo /etc/rc.d/syslogd restart
```

```
Stopping syslogd.
```

```
Starting syslogd.
```

```
[jschauma@apue$ ps waux | grep sysl
```

```
root      3035  0.0  0.2 35260 2248 ?        Ss      7:04PM 0:00.00 /usr/sbin/syslogd
-s
```

```
[jschauma@apue$ cat /var/run/syslogd.pid
```

3035

```
jschauma@apue$
```

## See also

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- `inetd(8)`
- <https://en.wikipedia.org/wiki/Systemd>
- <https://en.wikipedia.org/wiki/Launchd>
- <https://debian-handbook.info/browse/stable/unix-services.html>
- <http://www.frbsd.org/fr/chuck.html>