Advanced Programming in the UNIX Environment

Week 04, Segment 5: /etc/passwd

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/etc/passwd

Called a *user database* by POSIX and usually found in /etc/passwd, the password file contains the following fields:

Description	struct passwd **member**	POSIX.1
username	char *pw_name	✅
hashed password	char *pw_passwd	
numerical UID	uid_t pw_uid	✅
numerical GID	gid_t pw_gid	✅
comment	char *pw_gecos	
initial working directory	char *pw_dir	✅
initial shell	char *pw_shell	✅

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/etc/passwd

```
root:*:0:0:Charlie &:/root:/bin/csh
toor:*:0:0:Bourne-again Superuser:/root:/rescue/sh
daemon:*:1:1:The devil himself:/:/sbin/nologin
operator:*:2:5:System &:/usr/guest/operator:/sbin/nologin
bin:*:3:7:Binaries Commands and Source:/:/sbin/nologin
games:*:7:13:& pseudo-user:/usr/games:/sbin/nologin
postfix:*:12:12:& pseudo-user:/var/spool/postfix:/sbin/nologin
named:*:14:14:& pseudo-user:/var/chroot/named:/sbin/nologin
ntpd:*:15:15:& pseudo-user:/var/chroot/ntpd:/sbin/nologin
sshd:*:16:16:& pseudo-user:/var/chroot/sshd:/sbin/nologin
uucp:*:66:1:UNIX-to-UNIX Copy:/nonexistent:/sbin/nologin
nobody:*:32767:39:Unprivileged user:/nonexistent:/sbin/nologin
jschauma:*:1000:100:Jan Schaumann,Lieb Building,555-1234,555-2345:/home/jschauma:/bin/sh
fred::1001:100:::/bin/sh
drwho:*:1003:100:The Doctor:/home/drwho:/bin/date
alice:*:1004:100::/home/alice:
alice:*:1002:100::/home/alice:/bin/ksh
```

pw_name
pw_passwd
pw_uid
pw_gid
pw_gecos
pw_dir
pw_shell

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/etc/passwd

```
root:*:0:0:Charlie &:/root:/bin/csh
toor:*:0:0:Bourne-again Superuser:/root:/rescue/sh
daemon:*:1:1:The devil himself:/:/sbin/nologin
operator:*:2:5:System &:/usr/guest/operator:/sbin/nologin
bin:*:3:7:Binaries Commands and Source:/:/sbin/nologin
games:*:7:13:& pseudo-user:/usr/games:/sbin/nologin
postfix:*:12:12:& pseudo-user:/var/spool/postfix:/sbin/nologin
named:*:14:14:& pseudo-user:/var/chroot/named:/sbin/nologin
ntpd:*:15:15:& pseudo-user:/var/chroot/ntpd:/sbin/nologin
sshd:*:16:16:& pseudo-user:/var/chroot/sshd:/sbin/nologin
uucp:*:66:1:UNIX-to-UNIX Copy:/nonexistent:/sbin/nologin
nobody:*:32767:39:Unprivileged user:/nonexistent:/sbin/nologin
jschauma:*:1000:100:Jan Schaumann,Lieb Building,555-1234,555-2233:/home/jschauma:/bin/sh
fred::1001:100:::/bin/sh
drwho:*:1003:100:The Doctor:/home/drwho:/bin/date
alice:*:1004:100:/home/alice:
alice:*:1002:100::/home/alice:/bin/ksh
```

pw_name
pw_passwd
pw_uid
pw_gid
pw_gecos
pw_dir
pw_shell

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```
alice:*:1004:100::/home/alice:
alice:*:1002:100::/home/alice:/bin/ksh
alice@apue$ pwd
/home/alice
alice@apue$ ls -la
total 28
drwxr-xr-x  2 alice   users   512 Aug 10 22:51 .
drwxr-xr-x  6 root    wheel   512 Sep 23 21:15 ..
-rw-r--r--  1 alice   users  1772 Feb 14  2020 .cshrc
-rw-r--r--  1 alice   users   431 Feb 14  2020 .login
-rw-r--r--  1 alice   users   265 Feb 14  2020 .logout
-rw-r--r--  1 alice   users  1498 Feb 14  2020 .profile
-rw-r--r--  1 alice   users   166 Feb 14  2020 .shrc
alice@apue$ touch file
touch: file: Permission denied
alice@apue$ whoami
alice
alice@apue$ ls -ld
drwxr-xr-x  2 alice   users   512 Aug 10 22:51 .
alice@apue$ ls -lnd
drwxr-xr-x  2 1002   100   512 Aug 10 22:51 .
alice@apue$ id -u
1004
alice@apue$
```

/etc/passwd

- Most fields in the password database may be empty:

    - empty password field: anybody can log in (probably a mistake)

    - empty home directory field: use / instead

    - empty shell field: use /bin/sh instead

- Entries may be duplicated:

    - same GID: multiple users in the same primary group (normal)

    - same UID: system applies same permissions for all accounts (rarely used)

    - same username: system will pick one or the other (almost always a mistake)

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