



Getting started with OpenSolaris

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New OpenSolaris user: phase 1

**WOW! Cool features:
ZFS, DTrace, Zones,
CIFS, SMF, etc.**



New OpenSolaris user: phase 2

**c0d0t0s0... wtf...
pfexec what?
Why is my home in /export?
I can't login as root...**



After this session

I get it! All these weird things actually make sense now!



History of Solaris / OpenSolaris

- First incarnation: SunOS (1982)
 - Based on BSD
- Solaris – evolution of SunOS
 - SunOS rebranded as Solaris 1 - 1992
 - Inspiration from SYSV (SYSV packages)
- Solaris 10 – major update
 - ZFS, DTrace, Zones, SMF, BrandZ
 - x86 fully supported again
 - Decision to opensource Solaris – 2005
 - “Are we REALLY open sourcing it?”

History of Solaris / OpenSolaris

- OpenSolaris
 - Official open source distribution from Sun
 - Solaris Express Community Edition still exists
- Success of Linux
 - Free to download
 - Runs on common HW
 - Easy to use
 - Students learn it and once they get employed they use it for deployment
- Solaris needed to become more like GNU/Linux

“Familiarization” of Solaris

- GNU tools available
 - E.g. GNU tar by default
 - GCC available
- Bash default shell
 - Caused big controversy
 - If you don't like it, change it
- Gnome default desktop
 - KDE also supports OpenSolaris
- Popular Linux applications available
 - Firefox, Thunderbird, Pidgin, ...

End result

- For new users OpenSolaris is
 - Easier to get, install and use than Solaris
 - Easier to switch from GNU/Linux
 - Runs on common HW (workstations, laptops)
 - Interesting for students & universities again

What is different?

RBAC

- RBAC = Role based access controls
- Different profiles
 - Primary Administrator
 - System Administrator
 - Basic Solaris User
 - Printer Management
 - MySQL Administration
 - And so on...
- Harder to administer, but enhanced security

Root is a role

- Role = special account for administration
- Why? Security
 - Login as regular user first
 - Switch user to root using su
 - Configuration stored in `/etc/user_attr`
- Default user can become root
- Default user has primary admin privileges
- If you still want regular root account
 - `# rolemod -K type=normal root`

Pfexec

- Pfexec lets you run privileged programs
 - Example: `$ pfexec useradd joe`
- If your user has Primary Administrator privileges no password is needed
 - Makes it easier to use than sudo
- Sudo will be added in next release
 - Because Linux users want it
 - Simpler but less secure

Demo

Demo: Roles & pfexec

IPS vs. SYSV

- SYSV packages are original Solaris packages
 - Extension .pkg
 - Commands: pkgadd, pkgrm, ...
- OpenSolaris supports IPS and SYSV
 - IPS preferred
 - Command: pkg
- Retrieved from network repository
- Install as few SYSV packages as possible

Important updates for IPS

- Release notes contain important IPS updates
- Read the release notes
- Run the updates!
- Otherwise your system may not upgrade properly

Repositories

- Default - `pkg.opensolaris.org`
- Sun Freeware – `pkg.sunfreeware.com:9000`
- Blastwave – `blastwave.network.com:10000`
- In construction
 - Contrib repository
 - Commercial repository
- You can create your own repository!

Homes are in /export

- /home used for autofs
- At Sun you can come to any computer and your home is in /home
 - Because your real home is on the server
- /export/home is for local homes

Disk devices

- `/dev/dsk/c#t#d#s#` or `/dev/dsk/c#t#d#p#`
- `c#` - controller number
- `t#` - target number - i.e. the second device on this controller
- `d#` - logical unit
- `s#` - slice number (used mainly on SPARC)
 - `s2` = all slices
- `p#` - partition number
 - `p0` = all partitions
 - `p1` = first partition

Device types

- Block devices - `/dev/dsk`
 - Used e.g. by `mount`
- Raw devices - `/dev/rdisk`
 - Used e.g. by `fsck` and `fdisk`

Demo

Demo: format & fdisk

Networking

- Low-level control: ifconfig
 - Similar to ifconfig in Linux or ipconfig in Windows
 - Not very user friendly
- New daemon in OpenSolaris: NWAM
 - NWAM = NetWork AutoMagic
 - Manages both ethernet and wifi networks
 - Detects available networks
 - Connects automatically if it can
 - Provides options for wifi networks
 - Easier to use but no GUI yet

Demo

Demo: NWAM and ifconfig

AMP stack

- Packages for Apache, MySQL, PHP, Perl, Ruby
- Other languages in IPS repository, too
- Management tools for the AMP stack
- Dtrace probes for many languages
- Benefit from Solaris technologies
 - Virtualization
 - Clustering
 - Availability
 - Security

Demo

Demo: AMP stack

Beadm

- Manages boot environments
- BE automatically created on upgrade
 - You can reboot into BE before upgrade
- BE automatically created when package installation fails
 - You can reboot into BE before installation
- Commands
 - `$ beadm list`
 - `$ beadm create / destroy`
 - `$ beadm activate`
 - `$ beadm mount / unmount`

Demo

Demo: beadm

Upgrading OpenSolaris

- `pkg image-update`
- Warning! Read update notes (otherwise you may not boot up!)
- Bi-weekly builds published
- You get latest development packages
- If you want a stable system DO NOT UPGRADE!
 - Upgrade to the next 6-month release

Power management on laptops

- If your CPU fan spins like crazy, add these two lines to `/etc/power.conf`
 - `cpupm enable`
 - `cpu-threshold 15s`
- Save the file and then run this command
 - `$ pmconfig`
- Aaah... much better!

P-tools

- Pfiles – which files are opened by a process?
- Pstack – current stack of a process
- Pldd – which libraries are opened by a process?
- Pcred – under which UID is the process running?
- Pwdx – print working directory of a process
- More... (man pfiles)

Demo

Demo: P-tools

fuser

- Problem: You try to unmount a filesystem, but all you get is a "Device Busy".
- Answer: fuser
- Usage
 - `fuser -c [directory]`
- Killer feature
 - Kill all processes blocking target directory
 - `fuser -k -u /mnt/disk`

Demo

Demo: fuser

Bart

- Easy to use auditing tool
- `bart create -R /etc > manifest1`
- `bart create -R /etc > manifest2`
- `bart compare manifest1 manifest2`

Demo

Demo: Bart

Conclusion

- OpenSolaris has it's own “nature”
 - If you get used to it you will like it!
 - OpenSolaris technologies & tools are well integrated
- Very similar userland to GNU/Linux distros
- OpenSolaris has many neat sysadmin tools
 - Good control, OS can be secured well
 - Find out what's really happening in the OS
 - The challenge: know the right commands

Questions?



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Thank You.

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