What Comes to Mind with illumos?

• ZFS
• DTrace
• Crossbow (network Virtualization)
• Zones (sometimes known as Containers...)
  • Lightweight illumos instances
  • KVM zones
  • LX zones
• FMA
• SMF
illumos Pre-History

- SunOS up to 4.x was a 4BSD derivative.
  - SunOS 4.x came from 4.3BSD
- In 1988, AT&T (who had invested money in Sun) announced System V Release 4 (SVR4).
- This became SunOS 5.0, and marketed as Solaris 2 (with SunOS 4.x retroactively marketed as Solaris 1).
Consolidations

- Desktop
- Userland
- OS/Net (ie. SunOS)
- others…

Solaris
Solaris 2.1 through 2.6

• SunOS 5.x was the core of Solaris 2.x for $0 \leq x \leq 6$.

• x86 & SPARC kernel codebases were merged into one tree after 1991 acquisition of Interactive UNIX.

• Internal engineering processes matured.
  • Dogfooding on *jurassic* helped stop the Quality Death Spiral.
  • Some (bad) SysV-isms were downplayed or eliminated (e.g. sockfs replaced sockmod in Solaris 2.6).

• Solaris got much better over this stretch.
Solaris 7 through 10

• The initial 64-bit SPARC Solaris 2.7 was rebranded by marketing as Solaris 7.

• SunOS 5.x was the core of Solaris X for $7 \leq X \leq 10$

• Each release introduced tons of new things, too numerous to mention.

• Solaris 9 had x86 development "suspended".
  • A mistake rectified by internal revolt.

• Solaris 10 introduced amd64 support.
OpenSolaris

- Starting with a DTrace appetizer in 2004, Sun open-sourced most of the Solaris OS/Net consolidation in 2005.
  - OEM and some HW-specific code exempted.
  - MPL-like CDDL - a weak copyleft license.
- All other consolidations also open-sourced.
- Sun Marketing didn't quite know what to do.
  - "OpenSolaris Missile Crisis"
- Still, a good community formed around OpenSolaris.
OpenSolaris Consolidations

- Desktop
- Userland
- OS/Net (onnv-gate)
- others…
Oracle

• In early 2009, takeover rumors swirled around Sun.

• In late 2009, Oracle beat out IBM to purchase Sun.

• I can't speak for anyone else, but as a Sun employee I was hoping Oracle would fix the marketing mistakes (see earlier slides) and keep Sun's engineering culture intact.

• I was wrong.
illumos Begins

• In spite of the OpenSolaris Missile Crisis, people kept using OpenSolaris.

• Some wanted to unshackle closed-source components
  • Sun/Oracle didn't have a strong business case to do so.

• August 3rd, 2010 - Garrett D'Amore announced the culmination of a summer's effort to remove some closed-source: illumos

• illumos was originally a downstream of OpenSolaris's OS/Net. It was not intended to be a replacement, but insurance.
The Closing of OpenSolaris

• Others have told this story much better than I possibly could.

• Search for "illumos Fork Yeah" on YouTube and move to 33 minutes in:
  • https://www.youtube.com/watch?v=-zRN7XLCRhc&t=1980

• Time to cash in the insurance policy...
August, 2010

Desktop

Userland

others…

Oracle Solaris

Lawnmower picture by "Fir0002/Flagstaffotos" - CC BY-NC
More about illumos

• ORACLE IS NOT INVOLVED WITH ILLUMOS AT ALL!!!

• The term "Solarish" has been used to describe the common properties of both illumos and Oracle Solaris.

• The upstream illumos repository (illumos-gate) contains the kernel, (most) system libraries, and (most) system commands.

• It falls between what FreeBSD is (self-contained) and what Linux is (kernel only).
illumos has Distributions

• What people use when they use illumos is a distribution.

• <2010 - NexentaStor (storage appliance, commercial beyond a size limit)

• <2010 - Delphix (database appliance - commercial)

• 2010 - OpenIndiana (desktop and direct inheritor of OpenSolaris)

• 2011 - SmartOS (hypervisor-focused for clouds w/optional-paid-support)

• 2012 - OmniOS (stripped down for traditional servers w/optional-paid-support)

• There are more (DiLOs, OpenSXCE, Tribblix, XStreamOS, etc.)
Fork Yeah!

These aren't the only ones!
Meet The Distros

• One slide for every distro who offered.
• Where to get it.
• What it does.
• How best to engage.
• In approximate chronological order.
OpenIndiana

- Website: http://www.openindiana.org/
- Wiki: http://wiki.openindiana.org/
- Download ISO: http://dlc.openindiana.org/isos/hipster/
- The most direct inheritor of OpenSolaris.
- "Hipster" is a codename for the rapidly moving development branch.
- User Support: openindiana-discuss (http://openindiana.org/mailman/listinfo)
- Developer Support: oi-dev on freenode

(Thanks Ken Mays & Alexander Pyhalov)
SmartOS

• Home page: https://smartos.org/

• A distribution created specifically for servers in data centers.

• Geared toward all forms of virtualization.
  • Linux and illumos containers
  • KVM for arbitrary guests

• Boots on a small read-only ramdisk.

• #smartos on freenode and smartos-discuss list
  https://smartos.org/smartos-mailing-list/

(Thanks folks at Joyent)
OmniOS

- OmniOS is a server-focused, IPS-packaged distro.
- Stable releases every six months (014, 016...), every fourth stable is LTS (006, 014...).
- #omnios on freenode, and omnios-discuss mailing list:
  http://lists.omniti.com/mailman/listinfo/omnios-discuss
DilOS

- Home page: http://www.dilos.org/
- illumos base with Debian packaging (dpkg/apt-get).
- Working on Intel and SPARC (older models).
- Desktop not working yet.
- Works as Xen 3.4 dom0 with PV and HVN guests.
- LX Zone port from SmartOS in progress.

(Thanks Igor Kozhukhov)
Sonicle XStreamOS

- Company website: http://www.sonicle.com/
- ISO Releases: https://sourceforge.net/projects/xstreamos/
- illumos source: https://github.com/sonicle/xstreamos-illumos-gate/
- Supported Enterprise releases of XStream Storage and XStream Server.
- XStreamOS: A slim and straightforward server distro
- XStreamOS Desktop: light and modern desktop featuring a good set of selected applications
- IPS packaged, with a common repo with latest LibreOffice, Firefox, Thunderbird, Gimp...
- Mailing lists: http://lists.sonicle.com/

(Thanks Gabriele Bulfon of Sonicle)
Tribblix

- Ethos: Retro styling, modern components
- SVR4 packaging underneath, modern tooling on top
- Cut straight from illumos-gate, not a separate fork
- General purpose, strong on desktop and zones
- Works on both x86 and (limited) SPARC
- Based on personal and opinionated choices

(Thanks Peter Tribble)
Appliance Distros

- Not all illumos derivatives are suitable for hacking.
- NexentaStor - Network Storage appliance based on illumos - ZFS, NFS, CIFS, and COMSTAR work.
- Delphix - Database Storage appliance based on illumos, with especially strong ZFS use.
Extra Software

• pkgsrc
  • Joyent now employs Jonathan Perkin of pkgsrc fame.
  • pkgsrc is available for all illumos distros

• OpenCSW
  • An older, but well-maintained, Solaris software initiative.
  • Uses SysV packaging. Works on anything with SysV packaging tools.

• SFE: spec-files-extra IPS repository --> http://sfe.opencsw.org
  • Community supported on OpenIndiana, OmniOS, and even Oracle Solaris 11.
  • Open for other distros (IPS & SVR4).

• ms.omniti.com IPS repository (http://pkg.omniti.com/omniti-ms/)
  • Publicly unsupported, but we at OmniTI use these tools for our internal use.
Progress with illumos

• illumos KVM support (KVM Zones in SmartOS)
• COMSTAR improvements (esp. in NexentaStor)
• OpenZFS inspiration and reference implementation
  • Too much to mention here
• LX Zones back from the dead
• And more!
In the Past year

• In no particular order...

• EFI-partition/GPT booting.

• Able to build stock illumos-gate on other, non-OI distros.

• Various drivers: e.g. NVMe 1.0, open-source bnxe, more bge, e1000g/igb, and more.

• Integrated, open-source dmake and libm.

• Lots of OpenZFS forward progress.

• And more I'm forgetting.
Works in Progress

• OpenZFS Developer Summit held in October.
  • OpenZFS itself is now downstream from illumos. (To ease non-illumos OpenZFS contributions.)
  • http://open-zfs.org/

• Virtual Networking improvements brewing in SmartOS.
• More drivers: NVMe beyond 1.0, Intel XL710 (i40e)
  • Some help from vendors, but could use more.
How to Contribute?

- Start by **using** your favorite distribution(s).
  - Most distros have easy downloads (ISO, USB-dd, PXE)
  - Joyent Public Cloud
  - OmniOS has AWS images
  - Recent email thread shows more cloud providers
    - Bytemark
    - CloudSigma
    - OVH
Share Your Experiences

• Social Media (we have a strong twitter presence)

• Visit #illumos on Freenode (IRC).
  • Distros have channels too: e.g. #smartos #omnios #openindiana

• Blogs

• Tell your co-workers, IT folks, and management

• Let software projects you use know you're using illumos (e.g. PTPd).

• Let hardware vendors know you're using illumos.

• See something broken? File a bug!
  • [https://www.illumos.org/issues/](https://www.illumos.org/issues/)
How to Contribute Code?

• illumos repositories are on github.
  • [https://github.com/illumos/illumos-gate/](https://github.com/illumos/illumos-gate/)

• You can compile stock illumos-gate on at least OmniOS (new for 2015) and OpenIndiana.

• For small changes or independent modules, libraries, or commands, you can merely build components and replace them.

• Anything mentioned is *shrink-to-fit*, meaning a small spelling mistake needs a lot less scrutiny than, say, a driver rewrite.

• Sun's engineering culture lives on in illumos requirements.
More on How to Contribute

• Subscribe to the developers' mailing list:
  
  • https://www.listbox.com/subscribe/?listname=developer@lists.illumos.org

• Get peer review ("code review") on the developers' mailing list.

• Submit to illumos RTI Advocates, who will integrate your bits upon approval.

• Distro-specific repos (e.g. omnios-build) may have different procedures.
A Good Contribution

• Has an analysis in the bug report (inclusive-) or the code's block-comments itself.

• If it's a bug fix, finds when the bug was introduced (especially if it was post-OpenSolaris).

• Has been tested, AND has its testing documented, if not dropped into usr/src/test/.

• Any of the above is, again, *shrink-to-fit*. Use epic block-comments for epic code, e.g.
No Formal Organization

- We lack:
  - Bounties
  - Governance
  - Ownership
  - Marketing
  - Legal presence
  - Harassment Policy/Code-of-Conduct

- We would like to mature into **all** of these.
A Request to HW OEMs

• Do illumos-first development.

• I mentioned Solarish earlier. If you write for Oracle Solaris first, you lock out any/all illumos distros.

• If you write for illumos first, you can release and test that code, and THEN make modifications for Oracle Solaris without shutting out anyone.

• The community is ready to help. Especially those whose commercial success is dependent on a flourishing HW ecosystem.
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