Oracle Solaris 11
Customer Maintenance Lifecycle

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Oracle Solaris, Systems

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Agenda

- Image Packaging System (IPS)
- Solaris Maintenance Overview
  - Solaris 10 Maintenance
  - Solaris 11 Maintenance
- Solaris 11 Maintenance Policies
- Q&A

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Image Packaging System (IPS)

- Used in Solaris 11, Oracle Solaris Cluster 4.x, etc.
- Single tier packaging architecture
  - Replaces old SVR4-based 2-tier packaging and patch architecture used in Solaris 10 and earlier
  - Eliminates the deficiencies of the old architecture
    - No error prone hand crafted pre- or post-install scripts
    - No need to recurse patch dependency trees
  - Leverages ZFS Root snapshots to create Boot Environments
    - 'beadm' can be viewed as enhanced, integrated Live Upgrade
  - Packages downloaded from a Repository or ISO image on MOS
    - Only the applicable change delta subset is downloaded from 'fat' packages containing SPARC, x86, all locales, etc.

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Solaris Maintenance Overview

Solaris Maintenance Overview

- ## Proactive Maintenance
  - Time for pre-deployment testing
    - Identify configuration specific issues with 3rd party & home grown apps
    - Solaris Binary Compatibility Guarantee minimizes issues
  - Major Proactive Maintenance Windows
    - Often associated with hardware roll-out or other major upgrades
  - Minor Proactive Maintenance Windows
    - Planned bug fix updates
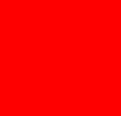   - Prevention is better (and much cheaper) than cure

- ## Reactive Maintenance
  - Break/fix situations or to address security vulnerabilities
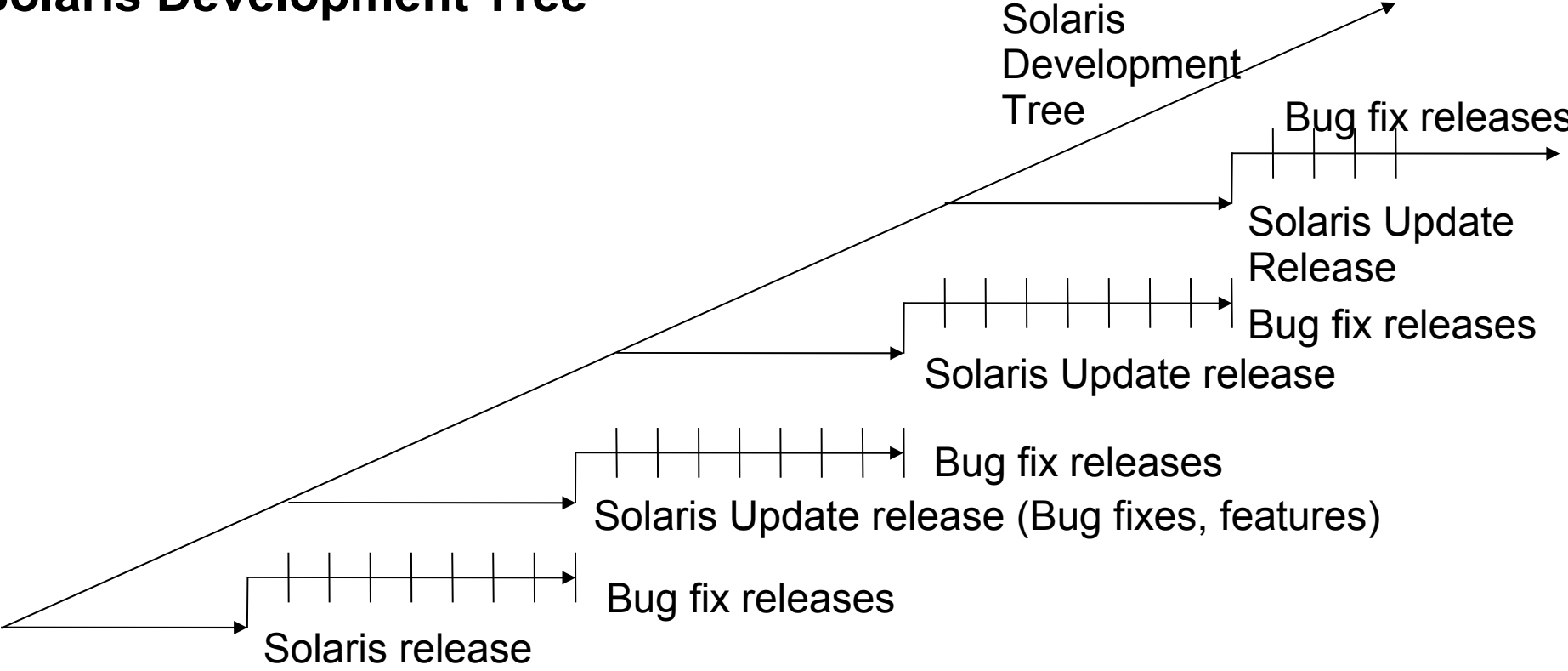   - Little time for pre-deployment test

Solaris Maintenance Overview

- All changes made to Solaris tip-of-tree source code
  - <u>Implies the more frequent the proactive maintenance, the smaller the change delta will be in reactive maintenance situations</u>

- Solaris Updates typically released once or twice a year
  - Hardware support
  - Software enhancements
  - Includes many new bug fixes and all acumulated bug fixes

- Customer Service Request bug fixes released in between Solaris Updates

- Interim Diagnostics & Relief (IDRs)
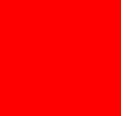 - Provide issue diagnostics or interim relief until final bug fix available

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Solaris Development Tree

Solaris
Development
Tree

Bug fix releases

Solaris Update
Release

Bug fix releases

Solaris Update release

Bug fix releases

Solaris Update release (Bug fixes, features)
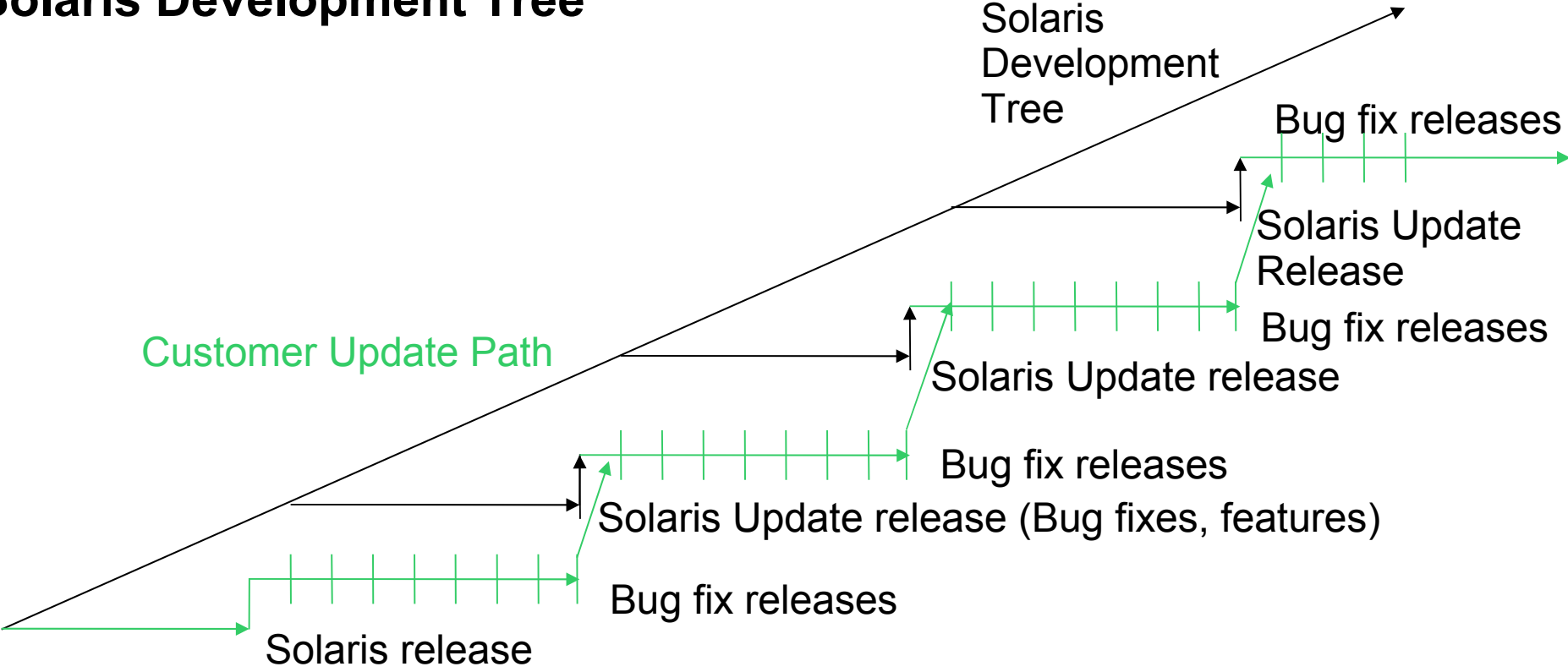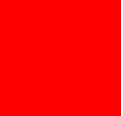
Bug fix releases

Solaris release

Solaris Maintenance Overview

- Solaris 11 Process Enhancement
  - Eliminated hiatus on release of critical bug fixes to customers during the pre-release phase of each Update once content finalized
    - Critical customer fixes can be included in the final SRUs before an Update release
      - Implies Update is not a complete bug fix superset of the final SRUs preceding it.
      - The SRU after the Update release will be a superset of the preceding SRUs and the Update release
    - Update path from final SRUs preceding an Update release is to the SRU after the Update release

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Solaris Development Tree
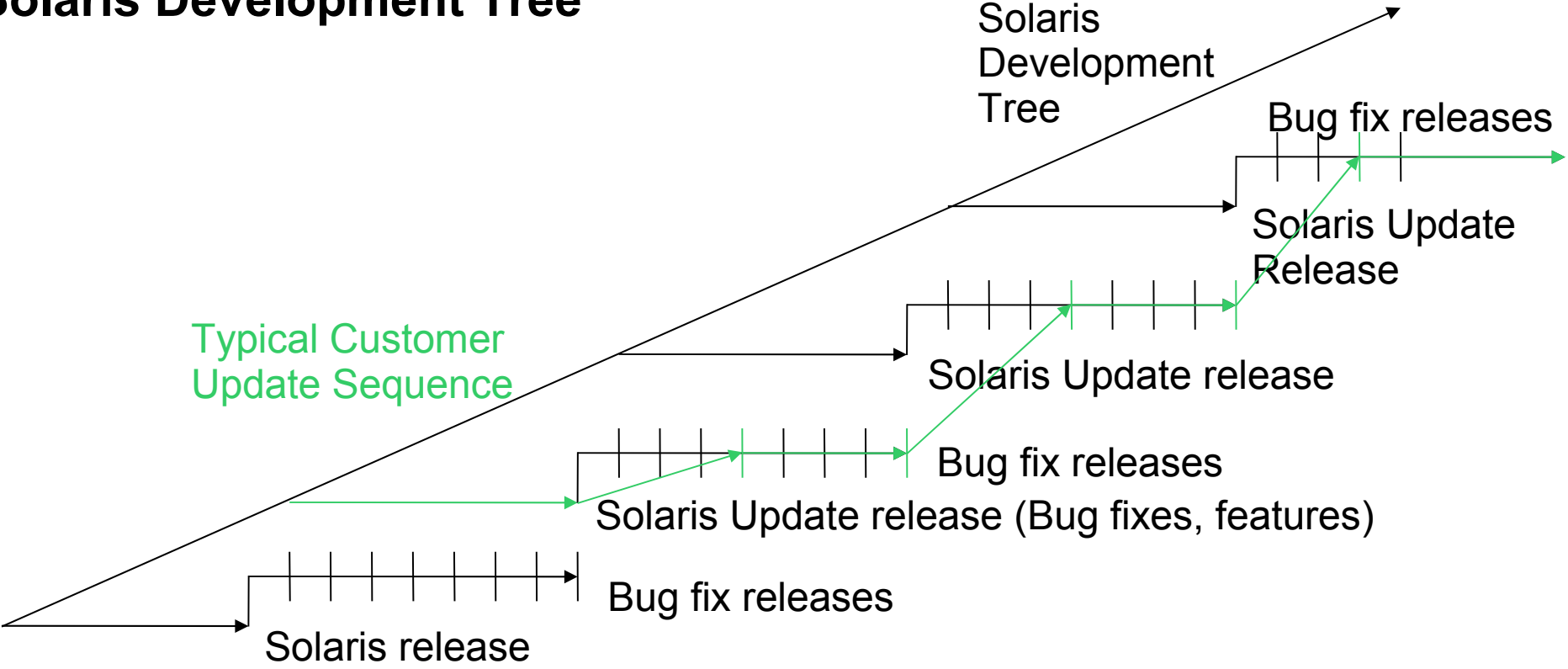
Solaris Development Tree

Bug fix releases

Solaris Update Release

Customer Update Path

Bug fix releases

Solaris Update release

Bug fix releases

Solaris Update release (Bug fixes, features)

Bug fix releases

Solaris release

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Solaris Development Tree

Solaris Development Tree

Bug fix releases

Solaris Update Release

Typical Customer Update Sequence

Solaris Update release

Bug fix releases

Solaris Update release (Bug fixes, features)

Bug fix releases

Solaris release

Solaris 10 Maintenance Overview

- Solaris 10 Updates typically released once or twice a year
  - Intensely tested
  - Some significant enhancements delivered:
    - ZFS, Trusted Extensions, Secure By Default, NewBoot, OPL, Zones enhancements
  - Large Kernel patches associated with each Update
    - Kernel patch "rejuvenation" provides discrete change between Updates – see
      https://blogs.oracle.com/patch/entry/solaris_10_kernel_patchid_progression
  - Includes many new bug fixes and all acumulated bug fixes
  - Provides high quality stepping stones to new and improved functionality

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Solaris 10 Maintenance Overview

- Recommend customers:
  - Upgrade to the latest Update release + Recommended Patchset in major proactive maintenance windows
  - Apply the Recommended Patchset in minor maintenance windows
  - Apply the appropriate patches to address the specific issue(s) in reactive maintenance break/fix situations
- But customers can apply any combination of patches in both proactive and reactive maintenance situations
  - Such "Dim Sum" or "a la Carte" patching results in unique software combinations
  - Resultant issues may be unique, which may take longer to debug & fix
 - Results in a sub-optimal customer experience

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Solaris 11 Maintenance Overview

- Solaris 11 Updates typically released once or twice a year
  - Intensely tested
  - Some significant enhancements may be delivered
    - Hardware support
    - Software enhancements
  - Existing packages updated
  - May introduce new packages
  - Includes many new bug fixes and all acumulated bug fixes
  - Provides high quality stepping stones to new and improved functionality
  - Sound familiar ? It's the same concept as Solaris 10.

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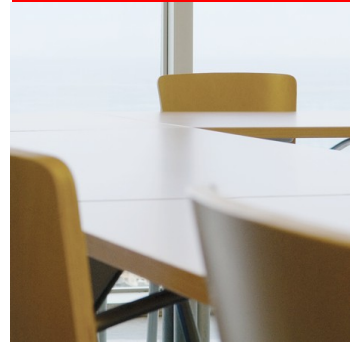
Solaris 11 Maintenance Overview

- Monthly bug fix Support Repository Updates (SRUs) released
  - Equivalent to Solaris 10 OS Recommended Patchset
  - Want to avoid replacing "dim sum" patching with "dim sum" packaging
    - Customers should apply an SRU as a unit in proactive maintenance windows
      - Provides limited number of Solaris baselines
        - Issues less likely to be unique, "safety in numbers" effect
        - Better customer experience
   - Customers may still minimize / "harden" systems
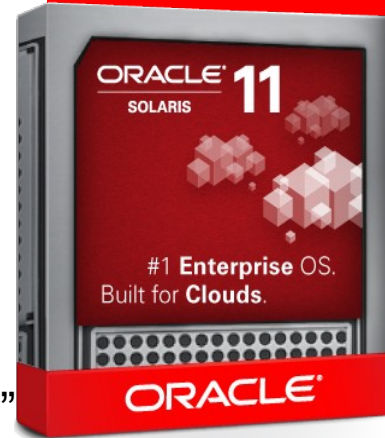
Solaris 11 Maintenance Overview

- Every third SRU is released on the quarterly Critical Patch Update (CPU) date in line with Oracle standards
  - Analogous to the Solaris 10 OS Recommended Patchset being renamed as the CPU
  - Publication of security vulnerabilities coincides with CPU release schedule
    - CVE & CVSS scores documented (Doc 1446033.1)
  - CPUs released for various layers of the Oracle stack on the Tuesday closest to the 17th of January, April, July, and October
  - Provides a set cadence enabling customers to schedule proactive maintenance windows

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Solaris 11 Maintenance Overview

- Recommend customers:
  - Apply the latest SRU in all proactive maintenance windows
  - Apply the appropriate SRU or FOSS/Userland/Desktop packages to fix specific issue(s) in reactive maintenance situations

- Want customers to run on a Solaris baseline as:
  - Intensely tested as a unit by Oracle prior to release
  - Tried and tested by other customers post release
    - "Safety in numbers effect", issues less likely to be unique, debugged & fixed faster
  - Improved customer experience
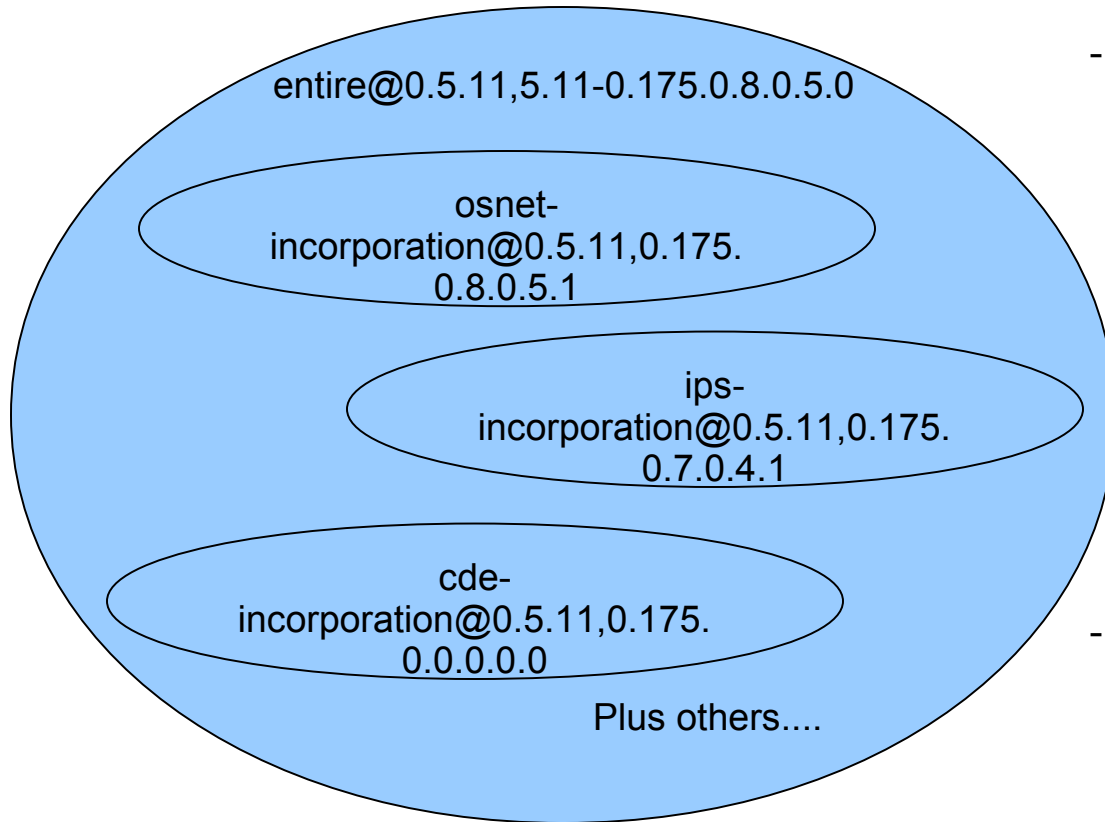   - Less administration, fewer issues, lower TCO

Solaris 11 Maintenance Policies
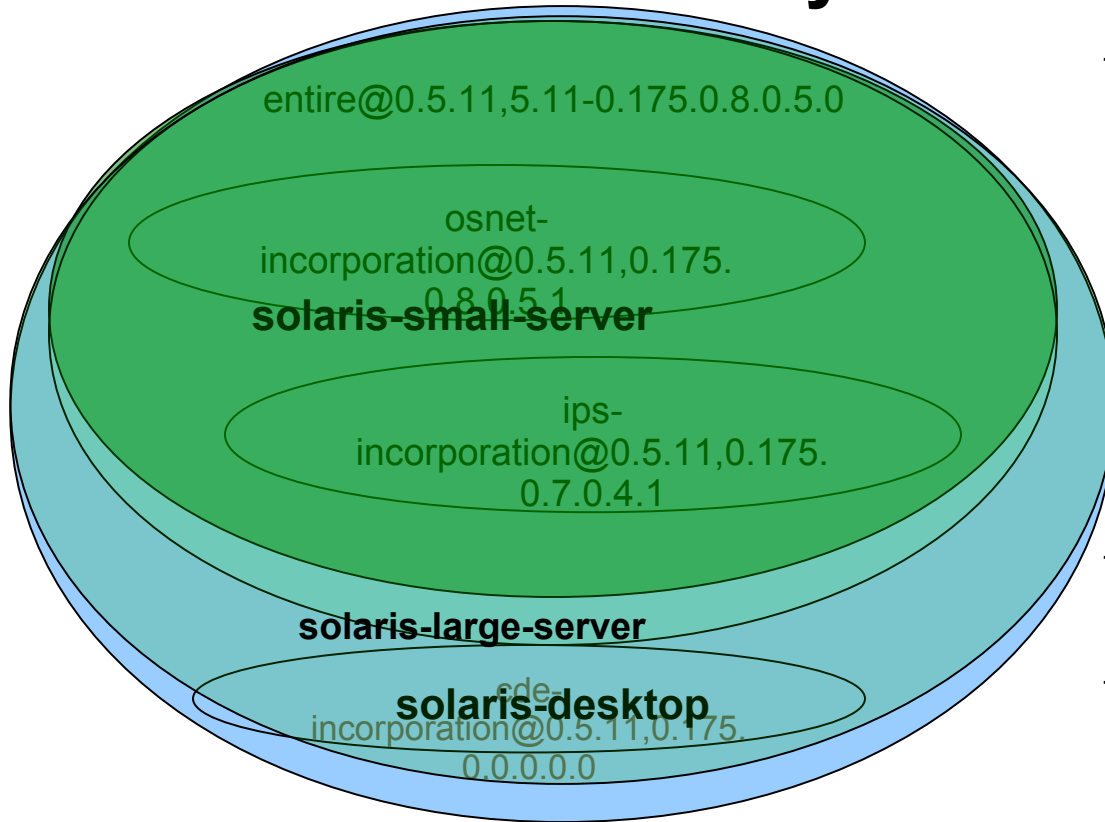
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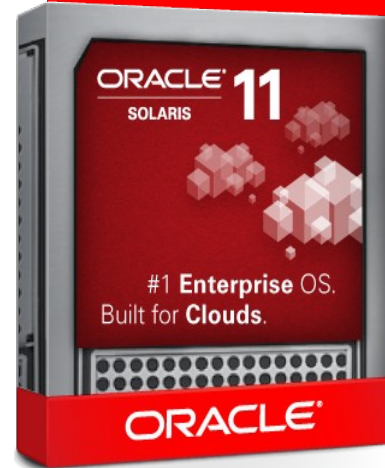
Solaris 11 Maintenance Policies

- Proactive Maintenance
  - Update Solaris 11 as a unit in scheduled maintenance windows
    - Update to an Update release or SRU every 6, 9, 12, or at a minimum every 24 months
    - Provide well defined, intensely tested Solaris baselines
- Reactive Maintenance
  - Apply the SRU which fixes the issue
  - FOSS/Userland/Desktop packages can be updated independently, if needed
  - Want customers to come back onto a Solaris baseline over time, so the baseline concept doesn't unravel

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Solaris 11 Granularity – IPS Perspective

entire@0.5.11,5.11-0.175.0.8.0.5.0

osnet-incorporation@0.5.11,0.175.0.8.0.5.1

ips-incorporation@0.5.11,0.175.0.7.0.4.1

cde-incorporation@0.5.11,0.175.0.0.0.0.0

Plus others....

- IPS Incorporations constrain the versions of packages which can be installed together:
  - "entire" is the overall incorporation which defines the baseline version of Solaris
  - "osnet-incorporation" defines the versions of the Kernel, system libraries, and associated commands
  - "ips-incorporation" defines the versions of the packaging software
- Packages which are not essential to the integrity of the system can be unlocked from their incorporation and updated independently

Solaris 11 Granularity – Install Perspective

entire@0.5.11,5.11-0.175.0.8.0.5.0

osnet-incorporation@0.5.11,0.175.0.8.0.5.1

solaris-small-server

ips-incorporation@0.5.11,0.175.0.7.0.4.1

solaris-large-server

solaris-desktop

sde-incorporation@0.5.11,0.175.0.0.0.0.0

- There are 3 Solaris install groups currently available:
  - "solaris-small-server" is the minimum install group
    - Use where security is paramount
    - Additional packages can be added as needed
  - "solaris-large-server" is a superset of "solaris-small-server",containing additional utilities (See Appendix)
  - "solaris-desktop" provides a Desktop environment
- "solaris-small-server" & "solaris-large-server" refer to the size of the Solaris installation, not the size of the server!
- Installing an SRU updates just the packages installed plus explicitly required dependencies
  - it doesn't add unnecessary packages

Solaris 11 Maintenance

- FOSS and Userland Components
  - Plan to keep in sync with community where possible
  - Solaris uses utilities like Apache, perl, Java, *sh, etc.
- Desktop
  - Plan to keep in sync with Oracle Linux
    - Can update *Office, Thunderbird, Mozilla, Gnome, etc., independently of Solaris & each other – see Appendix

Solaris 11 Policies – Proactive Maintenance

- Recommend customers update to a Solaris Update/SRU baseline at least every 12 months
  - Well defined, intensely tested baselines
    - SRUs for an Update cease when the next Update is released
- Customers must be on a Solaris Update/SRU baseline within 24 months of current to get discrete IDRs or packages for bug fixes in reactive maintenance situations
  - The 24 month limit recognizes that some customer legitimately have proactive maintenance cycles lasting more than 12 months

Solaris 11 Policies – Reactive Maintenance

- Recommend customers update to a Solaris Update/SRU baseline at least every 12 months
  - Will create IDRs on any baseline within 24 months of current
    - Customer gets discrete change if policy followed – Carrot
    - Not a radical change, as for Solaris 10, 86% of IDRs are based on patches less than 12 months old (see appendix)
    - IDRs will be created on request for subsequent Updates/SRUs as required, if the issue isn't already fixed in an Update/SRU
    - As with Solaris 10 and below, support for an IDR ceases once the final fix becomes available

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Solaris 11 Policies – Reactive Maintenance

- All packages released will depend upon the 24 month old Solaris Update/SRU baseline
  - Applying an IDR or any other package auto-updates the baseline if it's more than 24 months old
    - Ensures the baseline is kept reasonably up to date
  - If customer on a baseline older than 24 months, issues will still be analyzed
  - Reactive maintenance granularity of change for IDRs:
    - Baseline < 12 months old: Relief IDR
    - Baseline > 24 months old: Baseline + Relief IDR
    - Any level: Diagnostic IDR

Solaris 11 Policies – Reactive Maintenance

- All fixes are putback to the top-of-tree source code
  - The more the customer keeps up to date with proactive maintenance, the more discrete the change in reactive maintenance situations – Carrot
- Proactive maintenance policy ensures customers return to a Solaris baseline in due course

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Example 1: Assume "today" is a year after Solaris 11 releases
Can still get discrete IDR for any baseline

Dates and update intervals are for illustrative purposes only and are not indicative of any roadmap

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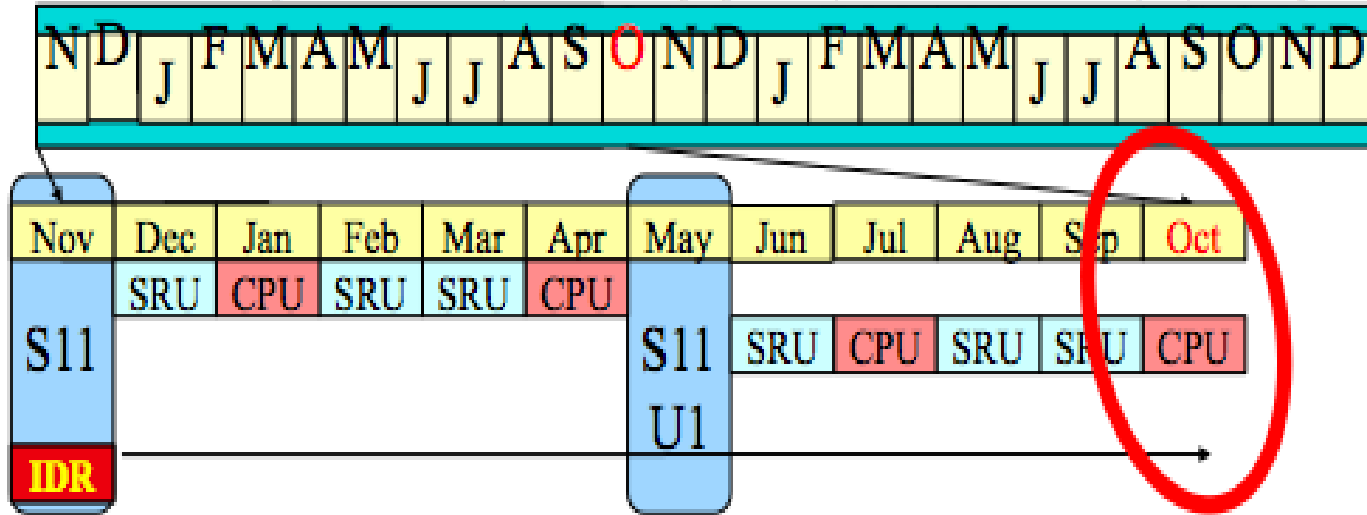
Example 2: Assume its 26 months after Solaris 11 release IDR dependency auto-updates Baseline to 24 month boundary

Dates and update intervals are for illustrative purposes only and are not indicative of any roadmap

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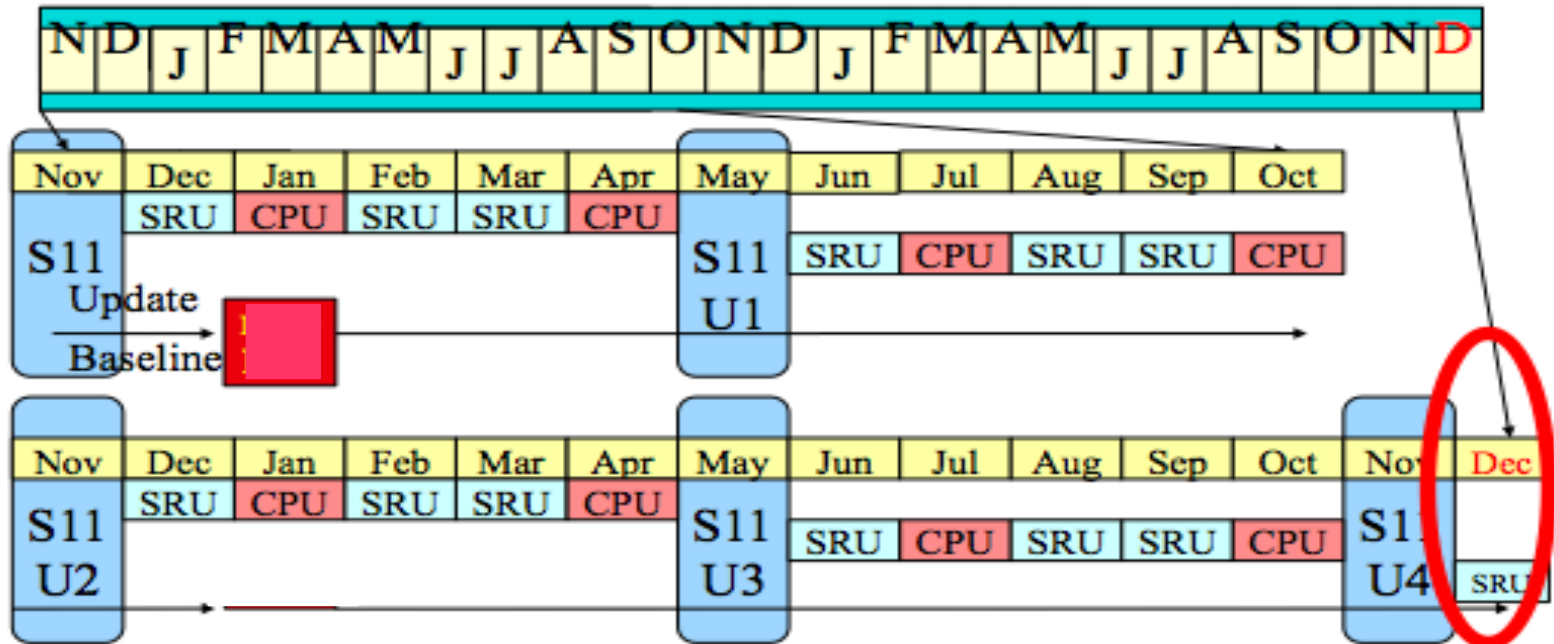
IPS IDRs (Interim Diagnostics or Relief)

- IDRs provide diagnostics or interim relief until fix available
- Each IDR is designed for a specific customer on a specific baseline
  - Only the customer(s) for whom it is designed can install the IDR
  - Maintains safety as IDRs may be toxic to other customers
- IPS now auto-supersedes an IDR when a fix is available in an SRU/Update release
  - No need to manually remove the IDR, which was the case on Solaris 10
  - IPS automatically does it for you

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Q & A

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IPS facets and freeze/unfreeze

- To update or freeze a non-core Solaris package
  - See `man pkg(1)` and
    http://www.oracle.com/technetwork/articles/servers-storage-admin/tips-maintain-s11-sru-1627108.html
  - A pkg can be updated independently if it has a "facet" enabling it to be unlocked from its "incorporation"
    - pkg contents -m userland-incorporation | grep 'version-lock'
  - Alternatively, the pkg can be frozen to prevent it from been updated with the rest of Solaris
    - If the pkg has no facet lock, it cannot be updated or frozen independently of its "incorporation"
  - Reverse such constraints and update when you want to bring such packages back in line with a Solaris baseline
 - Return to an Update/SRU baseline when possible

Solaris 11 Granularity

- To ensure integrity, there are several indivisible sets of pkgs within Solaris which cannot be unlocked from their incorporations using facets and which must be installed as units

  - The osnet-incorporation, which is core Solaris

    - Only 13 of the current 1,007 packages can be unlocked

  - The IPS packaging consolidation

  - Parts of the "X" consolidation which currently delivers 310 packages, of which 102 cannot be unlocked

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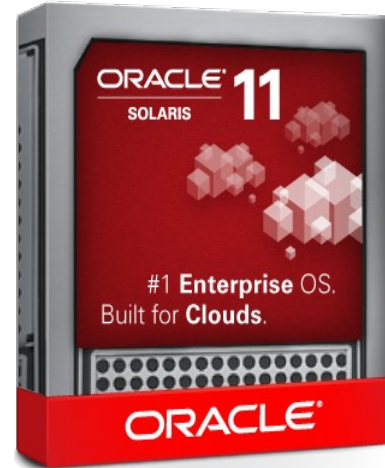
Solaris 11 Granularity

- Nerdy details:
  - The indivisible Solaris "core" currently consists of 1,007 packages in the "osnet-incorporation"
    - `` `pkg contents -m consolidation/osnet/osnet-incorporation | grep facet.version.lock` `` shows the 13 packages which can be unlocked from the incorporation
  - To see which install group was used to install a system, run `pkg list | grep group` and look for "solaris-small-server", "solaris-large-server" or "solaris-desktop"
    - Please note these group packages can be removed, so don't rely on them being there!

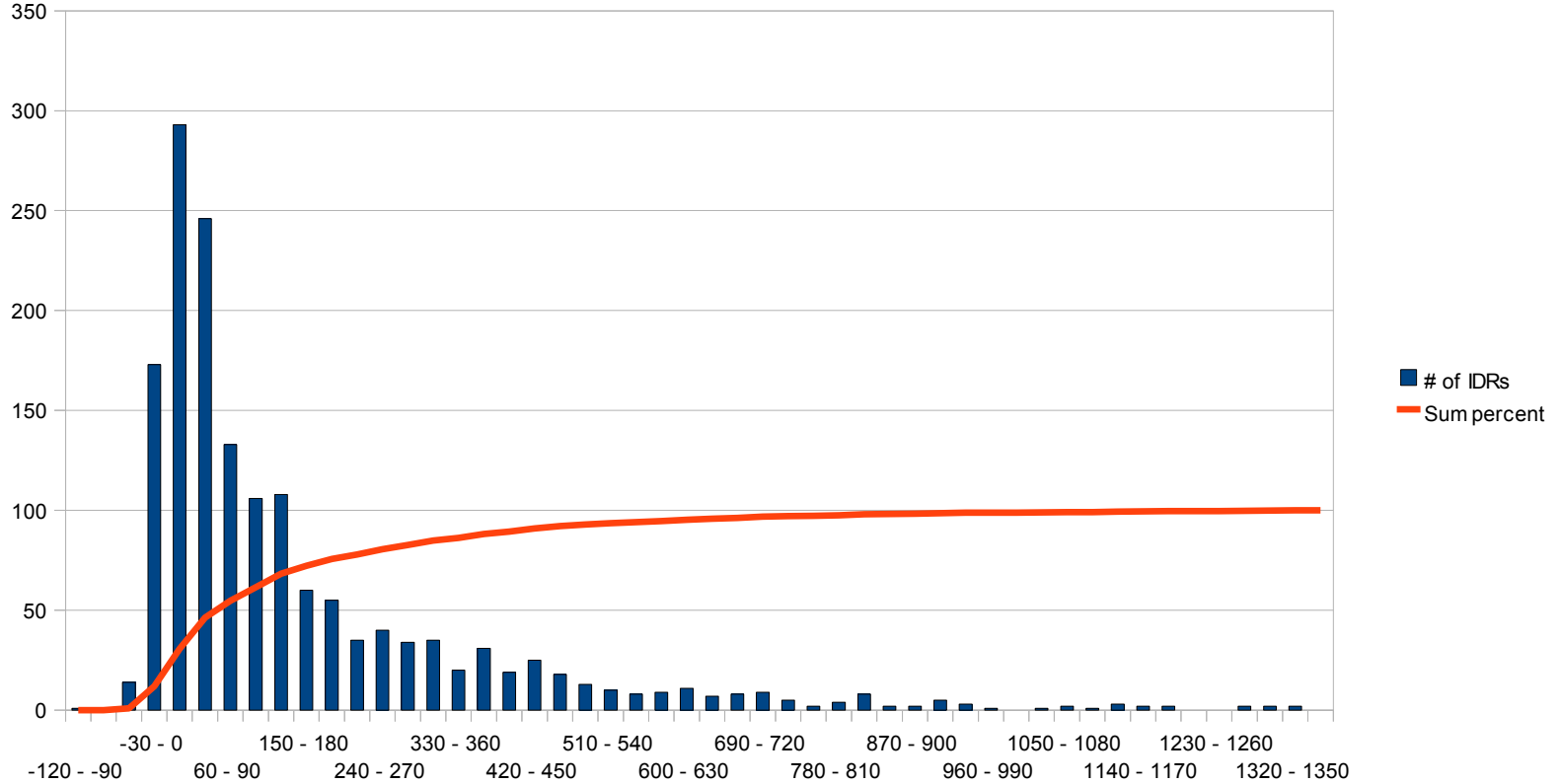| |

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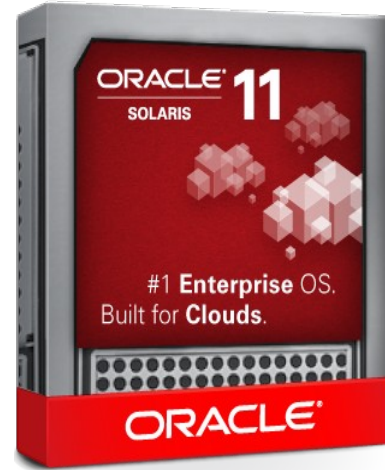
Solaris 11 Granularity

- Nerdy details:
  - The following additional packages are currently in the "solaris-large-server" install group compared to the "solaris-small-server" install group:
  - archiver/gnu-tar, crypto/pwgen, developer/build/gnu-make, developer/build/make, diagnostic/ddu/text, diagnostic/spray, diagnostic/top, editor/nano, file/filesync, file/gnu-coreutils, file/gnu-findutils, file/slocate, install/installadm, install/js2ai, media/cdrw, media/dvd+rw-tools, network/finger, network/ftp, network/ftp/ncftp, network/legacy-remote-utilities, network/netcat, network/talk, network/telnet, network/whois, package/rpm, package/svr4, print/cups, print/cups/filter/foomatic-db, print/cups/filter/foomatic-db-engine, print/cups/hal-cups-utils, print/filter/a2ps, print/filter/hplip, print/lp/filter/foomatic-rip, print/psutils, security/bart, service/diagnostic/spray, service/key-management/sun-fire-15000, service/network/comsat, service/network/dhcp/isc-dhcp, service/network/dns/bind, service/network/dns/mdns, service/network/finger, service/network/ftp, service/network/legacy-network-services, service/network/legacy-remote-utilities, service/network/load-balancer/ilb, service/network/ntp, service/network/slp, service/network/talk, service/network/telnet, service/network/tftp, service/storage/rmt, shell/expect, shell/pipe-viewer, shell/tcsh, shell/which, shell/zsh, system/accounting/legacy-accounting, system/boot/wanboot, system/data/terminfo, system/domain-configuration/sparc-enterprise, system/domain-service-processor-protocol/sparc-enterprise, system/dynamic-reconfiguration, system/embedded-fcode-interpreter, system/fault-management/snmp-notify, system/fru-id, system/hal, system/install/tests, system/kernel/dynamic-reconfiguration/i86pc, system/kernel/dynamic-reconfiguration/sun-fire-15000, system/kernel/dynamic-reconfiguration/sun-fire-880, system/kernel/dynamic-reconfiguration/ultra-enterprise-10000, system/kernel/inter-domain/ultra-enterprise-10000, system/management/snmp/net-snmp, system/management/snmp/net-snmp/addons, system/management/snmp/net-snmp/documentation, system/network-console, system/network/ppp, system/network/ppp/pppdump, system/network/ppp/tunnel, system/storage/media-volume-manager, system/storage/removable-media, system/xopen/xcu4, system/xopen/xcu6, system/zones/brand/brand-solaris10, terminal/screen, text/gawk, text/gnu-diffutils, text/gnu-grep, text/gnu-patch, text/gnu-sed, text/groff, text/texinfo

Age of patches on which S10 IDRs are based – 80% less then 9 months

Legend:
- # of IDRs
- Sum percent

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