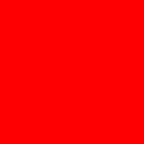


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**Solaris 11 Functionalities
Lifecycle Management and Provisioning**

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Agenda

- Introduction to OS-Lifecycle Management
- Installation
- The New Image Packaging System (IPS)
- Boot Environments
- Automated Installer (AI)
- Distribution Constructor (DC)



The Operating System: Key Territory

IT Challenges

- Maximize asset utilization
- Always on, service driven
- System performance
- Manage complexity



OS- Lifecycle Management

What do we mean ?

- **Installation**
 - System installation and Zones installation
 - Minimized installations
- **Upgrade between updates**
 - Reliable
 - Producible
 - Fall-Back
- **Patch**
 - System and Zones patching
 - Reduce downtime
 - Fall-Back on problematic patches

OS- Lifecycle Management

News in Oracle Solaris 11 Express

- New Installer
- Image Packaging System (IPS)
- New tools for Package Management
- Enhanced Patch- and Update-Procedures
- Automated Installer (AI)
- Distribution Constructor (DC)

Oracle Solaris 11 Express Download Media

<http://www.oracle.com/technetwork/server/storage/solaris11/downloads/index.html>

- LiveCD with GUI
 - x86 only
 - New easy GUI-based interactive installation
- Text Install
 - x86 and SPARC
 - New easy txt-based interactive installation
- Automated Install
 - x86 and SPARC
 - Boot-Image for AI-based boot and installation
- Repository Image
 - Combined x86 and SPARC
 - The complete copy of the Solaris Repository



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The need for a new package management

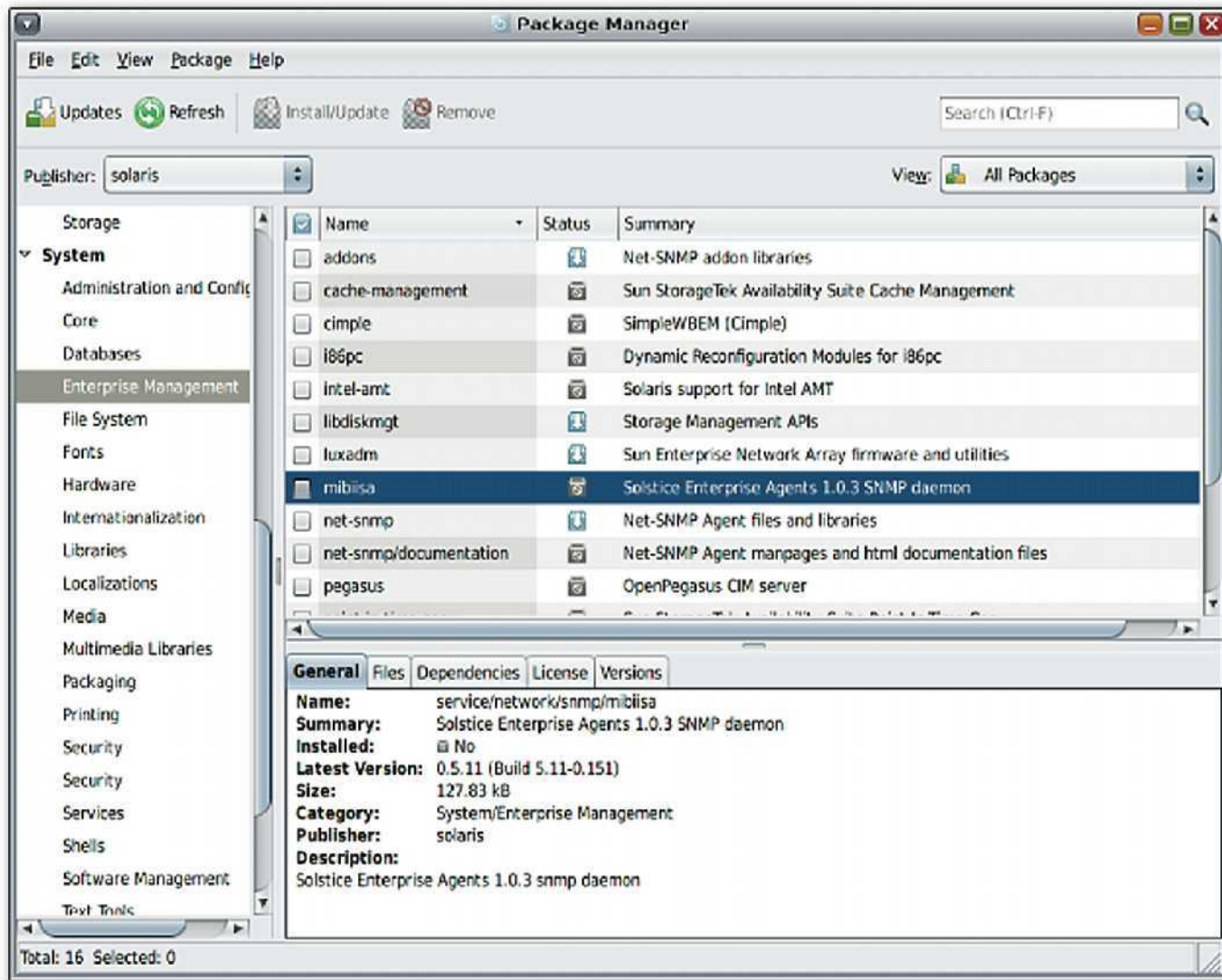
- Improve and streamline patch management
 - Make it just easier and less error prone
 - Fix patch accumulation and obsolescence issues
 - Have a similar way for install, patch and update
- Follow package and patch dependencies
 - No longer want to maintain 100's dependencies manually
- Integrate ZFS and other new technologies like SMF
 - Consequent use ZFS during install and upgrade
- Enable minimized installations
- Reduce installation time

The Image Packaging System (IPS)

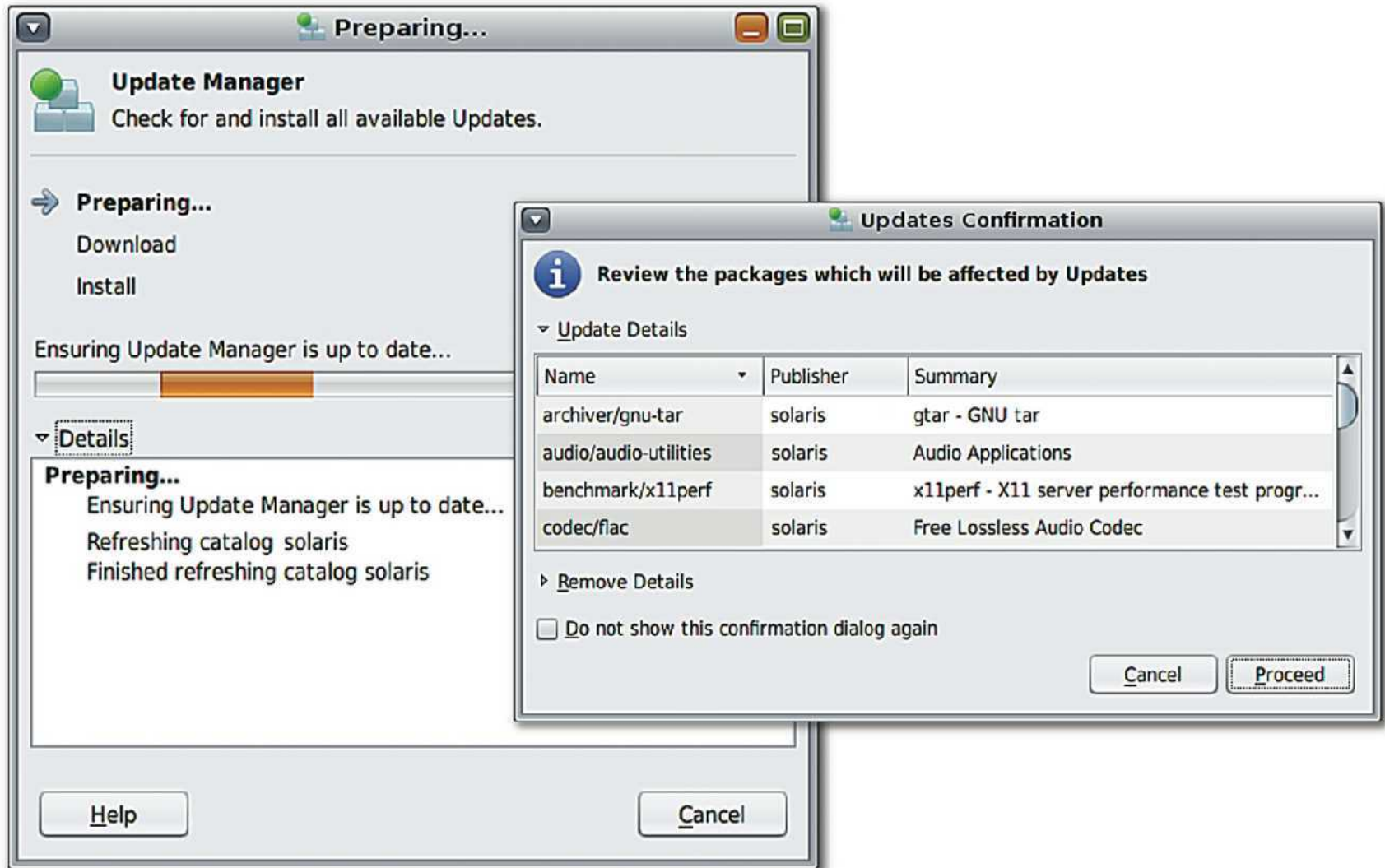
Overview

- Network-centric Package Management
 - Manifests and package content files
 - Efficient use of available bandwidth by using HTTP / HTTPS
- Alternative place Repositories into local directories
- Package Management
 - Installation, Update, Removal, Status
 - No longer pre/post remove/installation scripting in packages
- Robust follow automatically dependencies
- Patches are updated packages

Package Manager in Oracle Solaris 11 Express



Update Manager in Oracle Solaris 11 Express



New terminology in packaging (1)

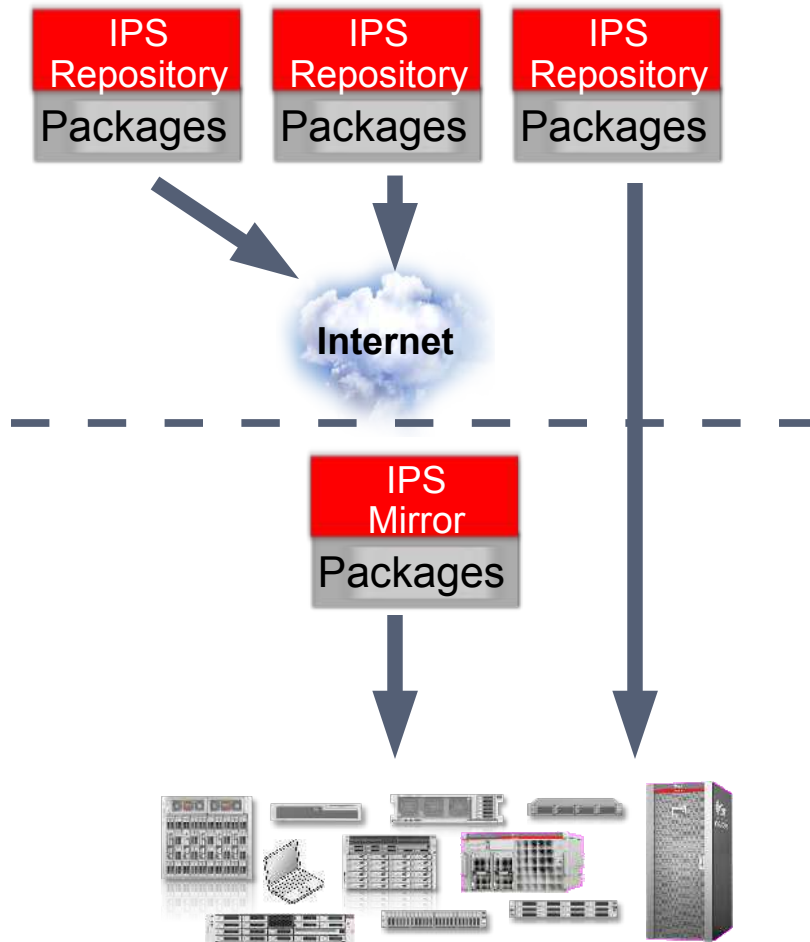
- Package
 - Installable Software unit
- Manifest
 - Text file with actions describing the package content
- Publisher
 - Person or organization that publishes packages
 - A publisher can publish to multiple repositories
- FMRI specifies a package
 - `pkg://{publisher}/{package name}@{version}`
 - Example: `pkg://solaris/package/pkg@0.5.11,5.11-0.151:20101027T054323Z`

New terminology in packaging (2)

- Image
 - Location in the filesystem where packages may be installed
- Boot Environment (BE)
 - Bootable instance of an image
- Repository
 - Location where clients publish and retrieve packages
 - Contains packages from a single publisher
 - Access by URI: file path, HTTP, HTTPS
 - Origin
 - Package content and metadata (manifests and catalogs)
 - Mirror
 - Package content only

The Image Packaging System (IPS)

Network-Architecture



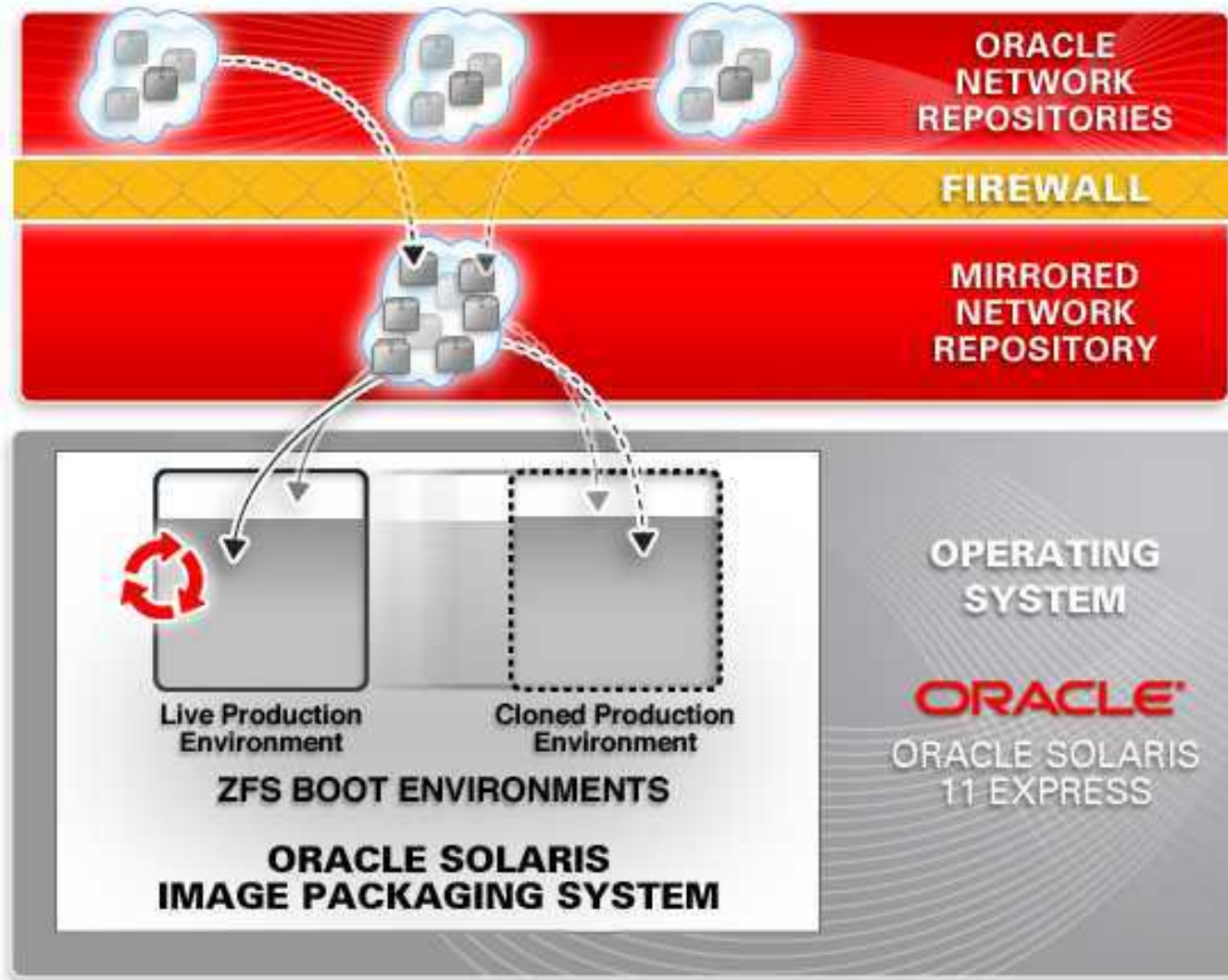
- One or more repositories
- Possible with local mirrors or copies
- Access by HTTP/HTTPS

- Installation and Upgrade of packages on client
 - `pkg(1)`
 - `updatemanager`
 - `packagemanager(1)`

Oracle Solaris 11 Express Repositories

- <http://pkg.oracle.com/solaris/release>
 - Default repository for Oracle Solaris 11 Express
- <https://pkg.oracle.com/solaris/support>
 - Support repository providing the latest bug fixes and updates
 - SRU = Support Repository Updates
 - Access is restricted to users with current Oracle Solaris support contracts

IPS and Boot Environments



Boot Environments

- Use ZFS snapshot and clone to replicate the active operating system image
- BE is automatically created if
 - Drivers and kernel packages install
 - Update All (GUIs) or image-update (CLI)
- BE and Zones
 - Existing Zones become a part of the new created BE
- Manage with one command
 - `beadm(1M)`
- Makes updates safe, reliable, recoverable

Agenda

- Introduction to OS-Lifecycle Management
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Automated Install (AI)

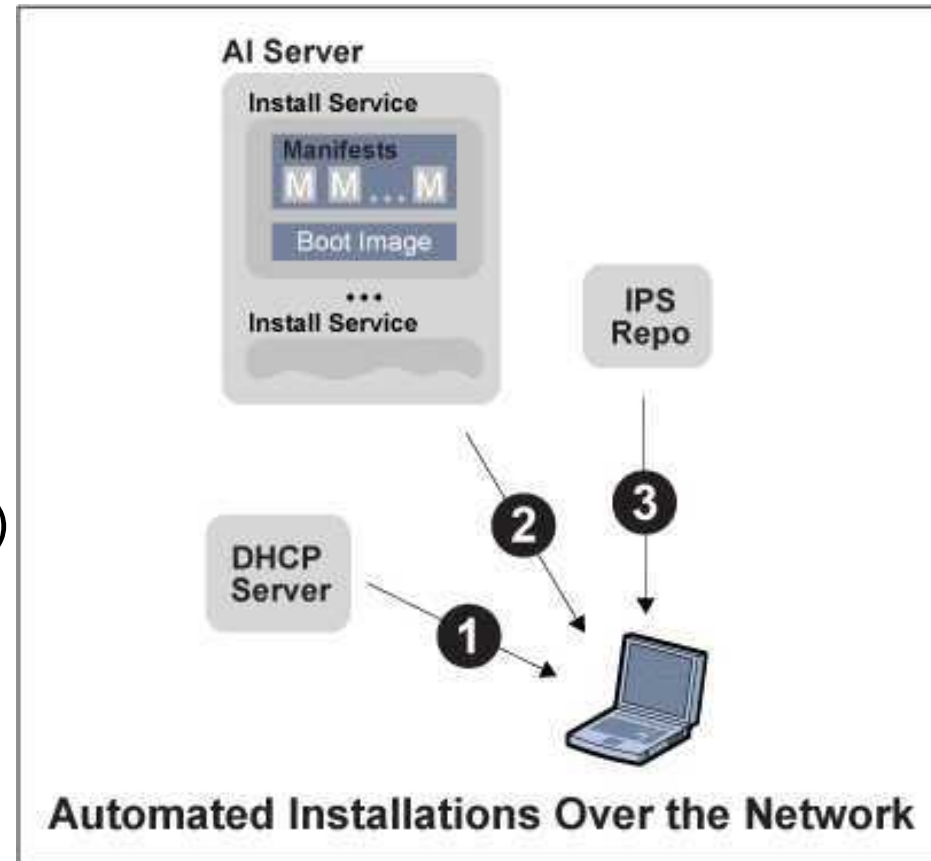
Overview

- Automated Installation of Oracle Solaris 11 Express
 - Runs on Oracle Solaris 11 Express
 - Fast, easy, uniform, hands free installation of systems
- Different sources of installation packages
 - Network/local/distributed/LAN/WAN
- Use existing new Solaris technology
 - IPS, SMF, ZFS
- Easy Administration
- Customization of installations with xml-files
- Separat Installation and System-Configuration
- Post-Installation via first-boot-SMF-Services

Automated Installer

Functionality

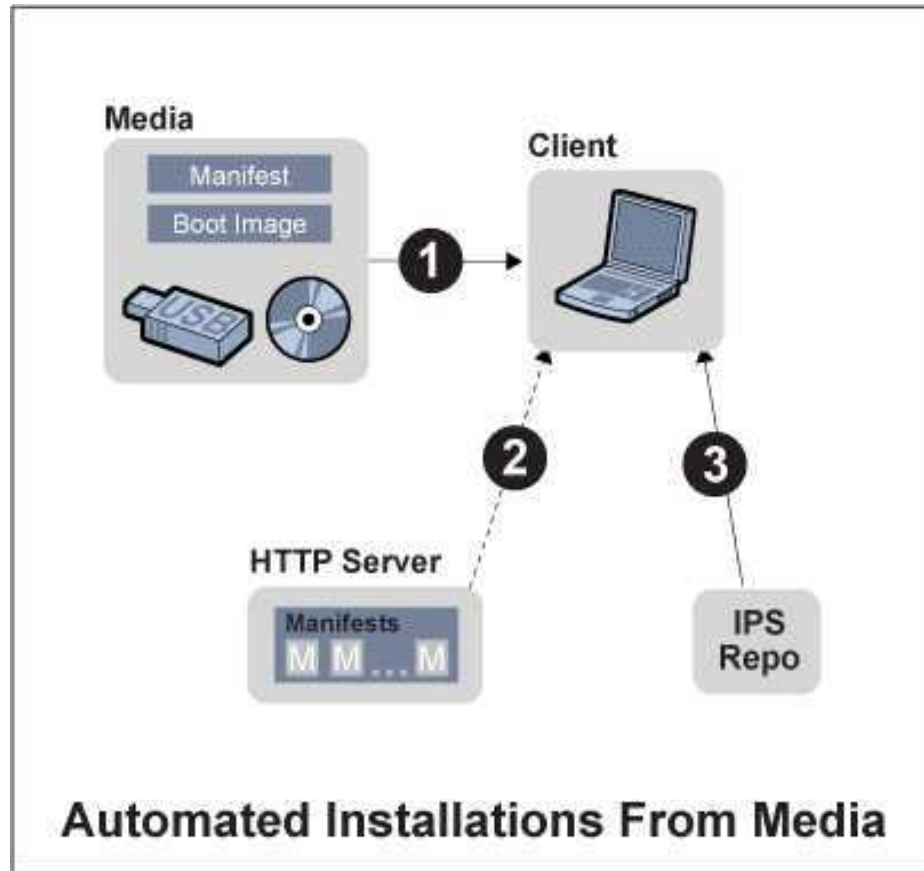
- Manifests (XML) to configure the Installation and the systems
- Package installation from IPS-Repositories
 - Package-Updates (Patches) integrated as packages
- Required
 - OBP WANboot (SPARC)
 - pxeboot (x86)



Automated Installer

Functionality without boot via network

- Boot from AI-Media
 - CD
 - USB
- Follow-up with automated installation
 - Control via manifests



Parts of AI-Server

- AI-Software
 - IPS Package `installadm` and dependencies
 - Services: DHCP, TFTP, mDNS, HTTP/S
 - `installadm(1M)` is the central tool to manage AI
- Manifests
 - Konfiguration of client and installation
- IPS-Repositories
 - Source of software packages
- AI-media
 - Create miniroot for netboot
 - Possible to customize with Distribution Constructor (DC)
`distro_const(1M)`

AI-Server and Manifests

- AI-Manifest
 - Define the Installation
 - Disk, Partition, IPS-Repositories, Packages
- SC-Manifest
 - Define the configuration of the system
 - Timezone, root-Password, preconfigured user
- Criteria-Manifest
 - Assign AI- and SC-manifest to Client
 - Value or Area
 - ARCH/CPU/IPV4/MAC/MEM/PLATFORM

Rosetta Stone for Solaris 10 Users

Software Installation Management



Solaris 10	Solaris 11 Express
SVR4 Packages	IPS Packages
Install DVD	Install CD + pkg repository
Live Upgrade	Boot Environments
Upgrade from installer	pkg(1), Update Manager
JumpStart	Automated Installer(AI)
JumpStart Profiles	AI manifests
Flash Install	No equivalent yet
Blueprints for custom DVD's	Distribution Constructor

JumpStart to AI Mapping

JumpStart	AI
setup_install_server	installadm create-service
add_install_client	installadm create-client
Begin script	Derived Manifests, Driver Update, customized boot image from Distribution Derived Man
Jumpstart profile and rules	AI manifest + criteria
Finish script	Pre-reboot tasks = pkg actions
	Post-reboot tasks = first boot SMF service
sysidcfg file	SMF configuration profile

Distribution Constructor (DC)

- Construct installation images and VM images
 - Used by Solaris engineering to build the product
- Use DC to build images
 - Put additional drivers or services into AI or install images
- XML manifest (similar to AI) specifies construction
- Checkpoint/resume feature nicely leverages ZFS
- Fully extensible – plug your own customizations into build process
- See `distro_const(1M)` for more information

Prepare to get ready for IPS and AI

- IPS is the new standard for Oracle Solaris 11
 - SVR4 packages still usable
- Begin to think in terms of Repositories for packages
 - “On disk” or “Over network”
 - Create your own repositories, use Oracle or some third party ?
- New paradigm, what does that mean ?
 - Packages without scripting
 - No patches
- Start thinking about adopting AI
 - What really needs to be “migrated” from Jumpstart to AI ?

LifeCycle Management in Oracle Solaris 11 Express

- Faster and easier deploy, configure and update
- Much less planned downtime during installation or patch
- A lot of things are new, but the principles stay
 - Transition documentation and tools are in the works
- Improvements
 - Dependency checking
 - Reliable and safe upgrade with fall-back capability
 - Less required customization work
 - Comprehensive customization capabilities by design

Resources

- Oracle Solaris 11 Express Image Packaging System Guide
 - <http://download.oracle.com/docs/cd/E19963-01/pdf/820-6572.pdf>
- Managing Boot Environments With Oracle Solaris 11 Express
 - <http://download.oracle.com/docs/cd/E19963-01/pdf/820-6565.pdf>
- Oracle Solaris 11 Express Automated Installer Guide
 - <http://download.oracle.com/docs/cd/E19963-01/pdf/820-6566.pdf>

Q & A



Hardware and Software

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