



OpenSolaris: Update

What Makes it Interesting

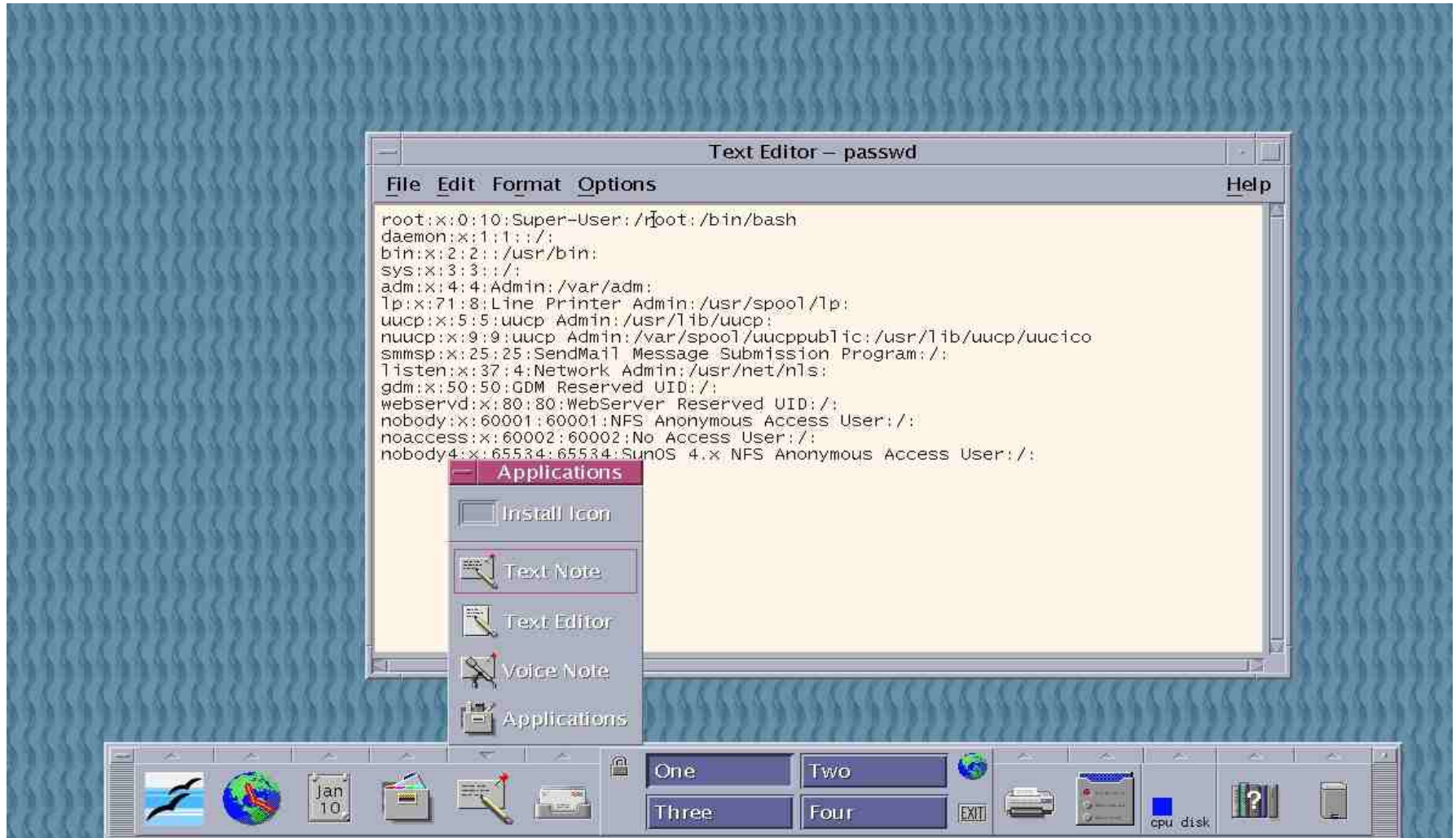
Adhari C Mahendra
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Sun Microsystems Indonesia

What is OpenSolaris?

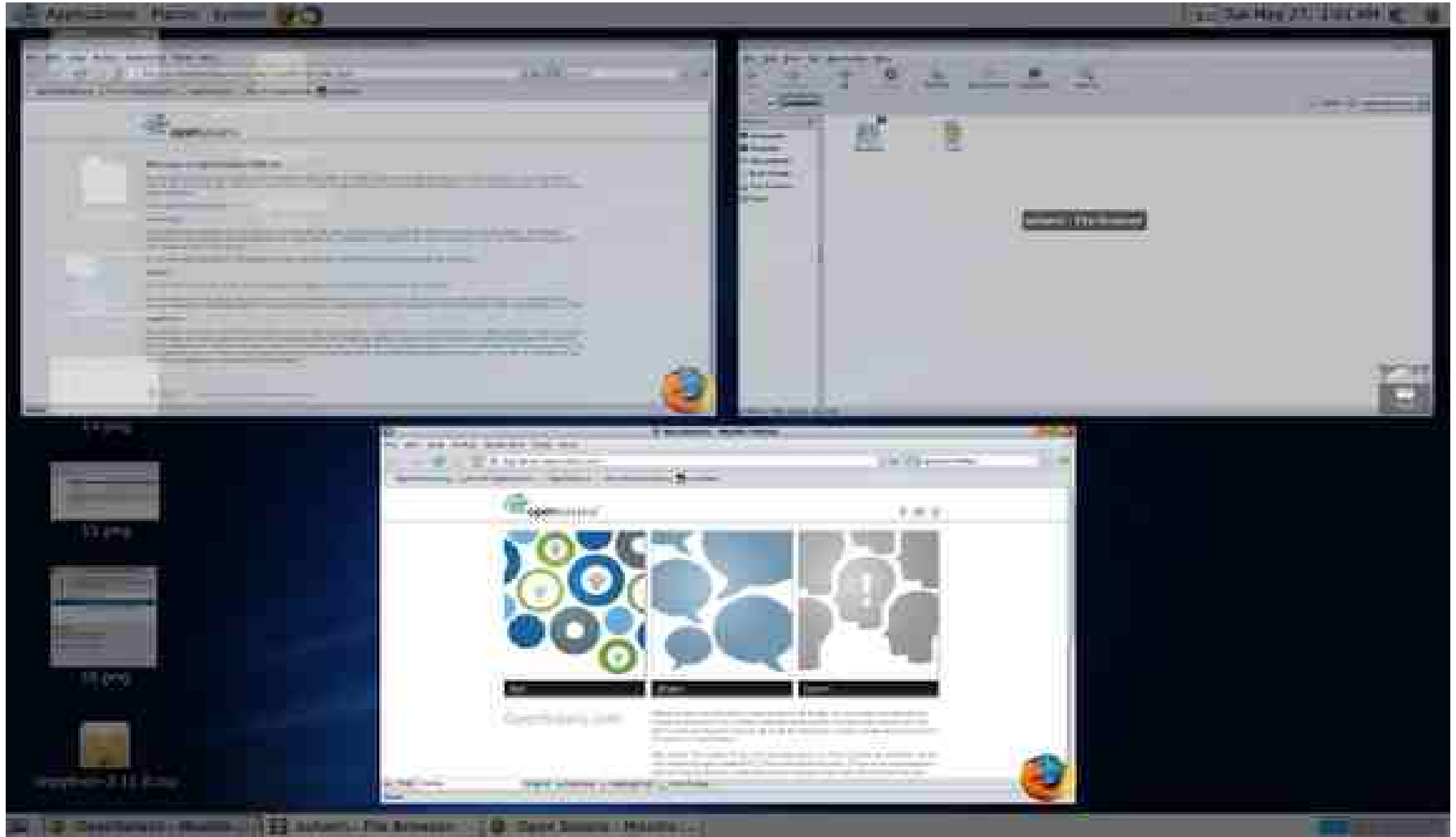
- New Operating System distribution, based on source code of Solaris
- First release: 2008.05
- Open Source
- Redistributable
- Free to use and deploy
- Supported



It's Not Your Father's Solaris



It's Now Yours



Solaris vs OpenSolaris*



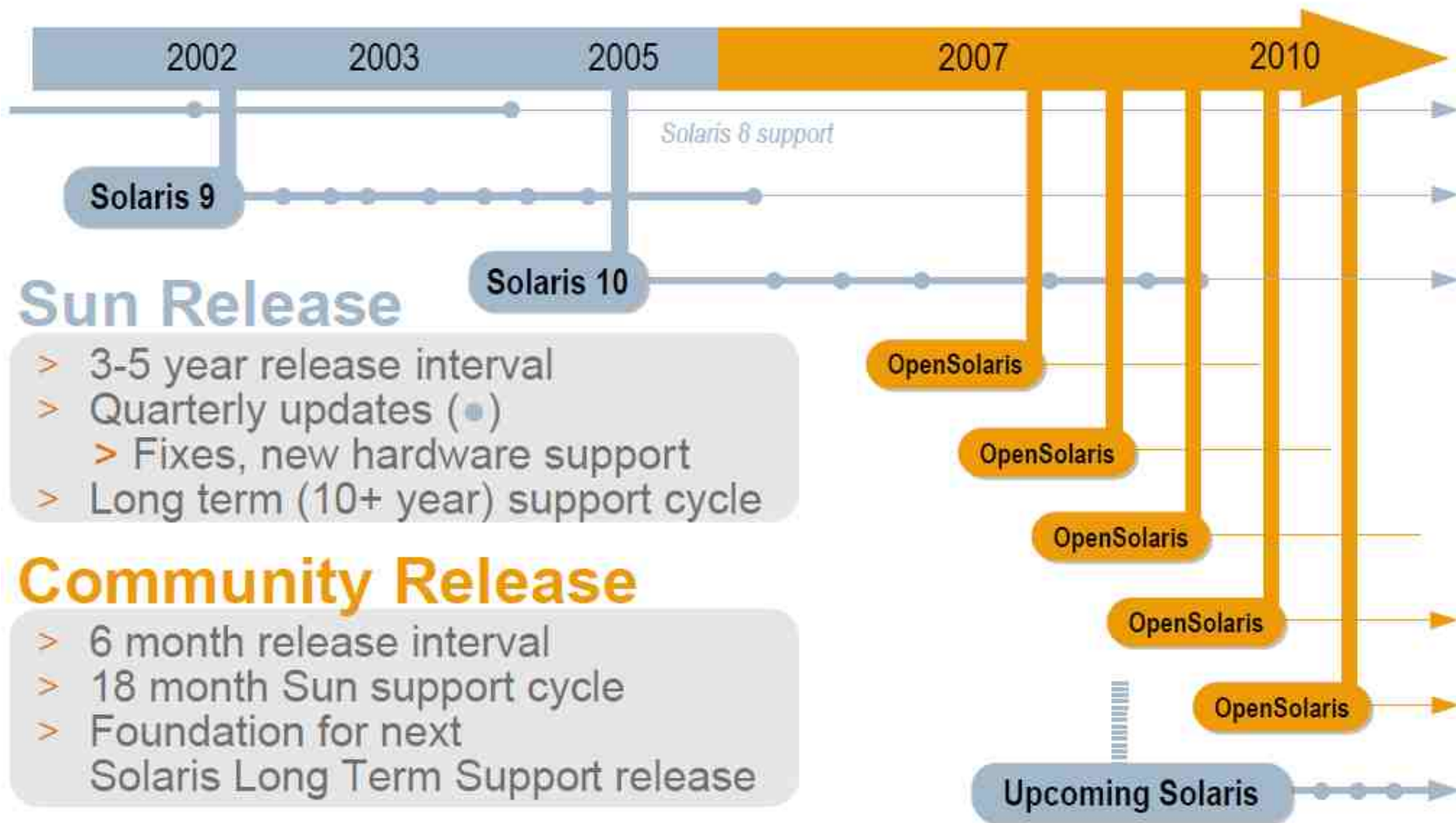
- Enterprise class
- Unmatched level of support
- Long release cycle (3-5 years)



- Web economy
- Latest Solaris innovations
- Short release cycle (every 6 months)

Solaris Release Model

20 Years, One Development Train



Values in Solaris 10, Years Back (Updated)

**Extreme
Performance**
Dynamic Tracing

**Relentless
Availability**
Predictive Self Healing

**Unparalleled
Security**
Process Rights Management
Crypto Infrastructure
Trusted Extension
ZFS Encryption (soon)

**Optimal
Utilization**
Zones, LDOM, xVM



**Platform of
Choice**

New UltraSPARC T1, T2, T2+,
New Generation SPARC64,
New AMD Opteron,
New Intel Core 2

Values

○ Engineering Values

- Performance
- Security, Availability
- Manageability
- Reliability, Compatibility
- Serviceability
- Platform Neutrality

○ Community Values

- Honesty
- Openness
- Independence
- Transparency
- Quality
- Respect

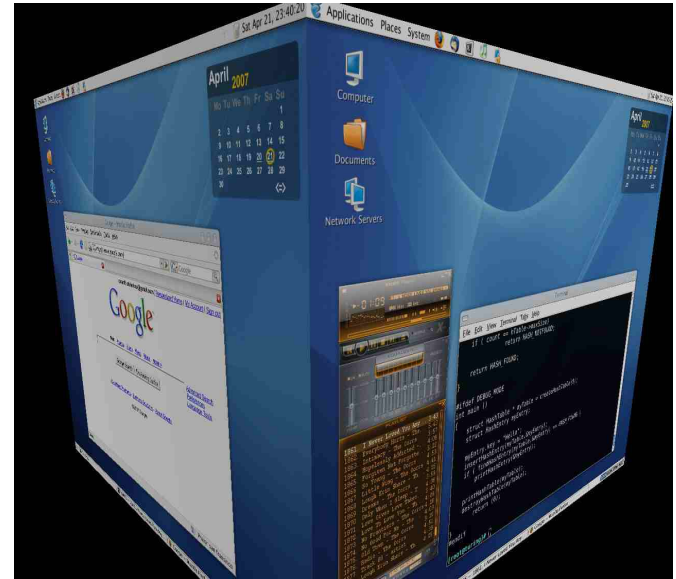
OpenSolaris is

- Easy to get
 - ISO image, bittorrent, mirrors
- Easy to install
 - Modern graphical installer
- Easy to use
 - Gnome environment + many applications
- Easy to maintain
 - Update using packages repositories



Features

- Redistributable LiveCD image
 - Boot it to give it a try
 - Install from live session
- Accelerated video drivers
- Gnome/compiz desktop
- Basic software included
 - Firefox, Thunderbird, Gimp, ...
- Package Manager
- Time Slider soon...



Is Your Data Safe?

- There are two types of disks:
 - Those that have already failed
 - Those that are about to fail

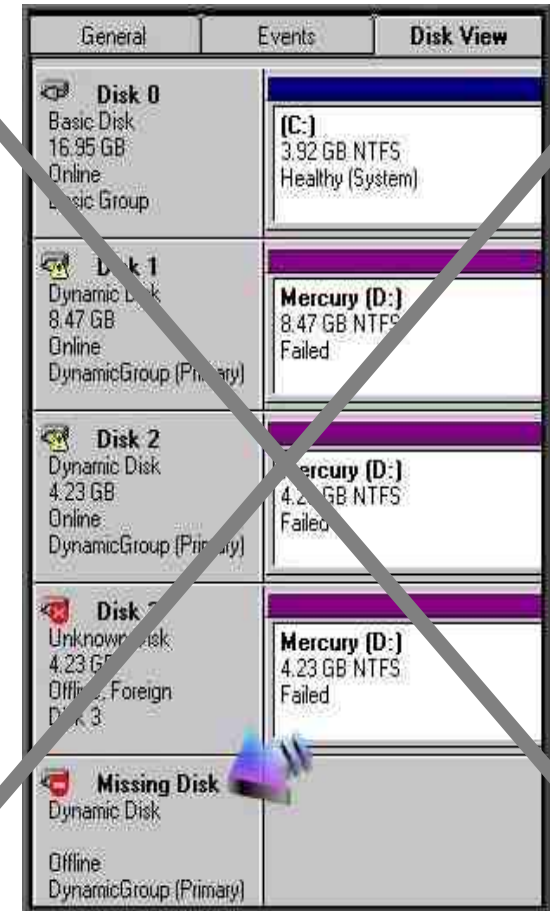


Measurement at CERN

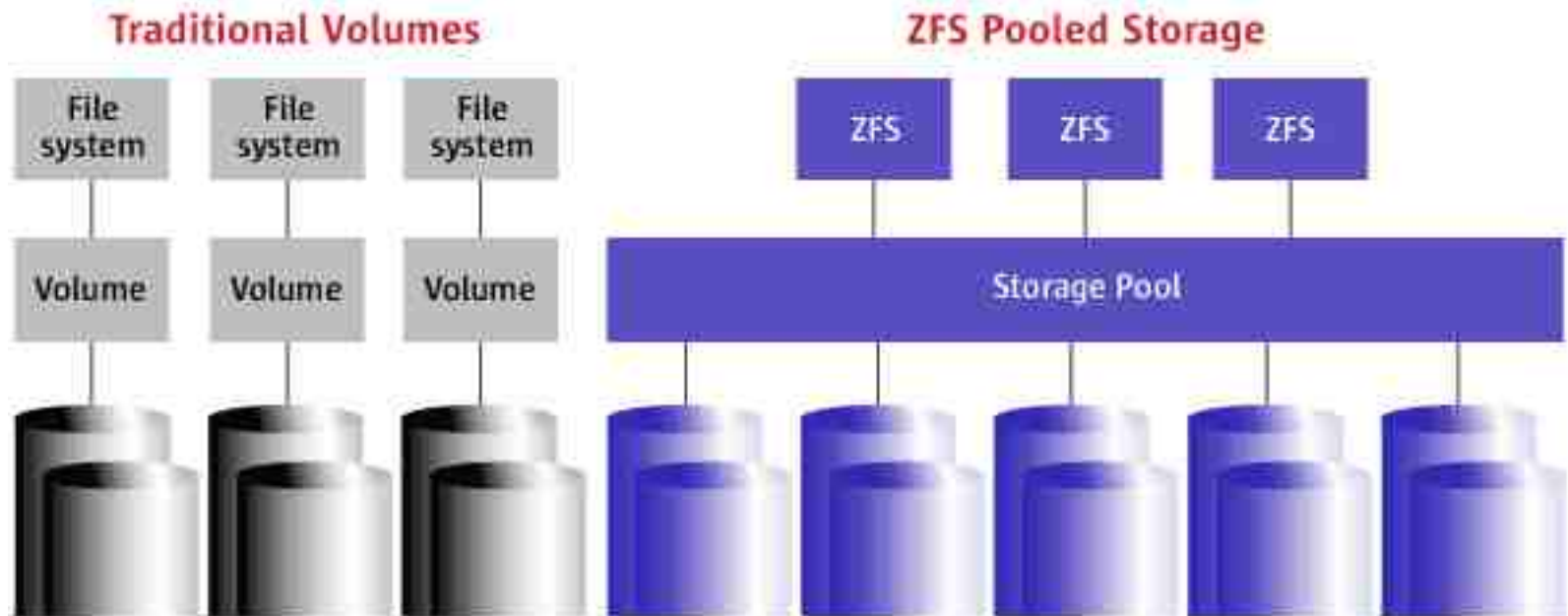
- Write a simple application to write/verify 1GB file
 - Write 1MB, sleep 1 second, etc. until 1GB has been written
 - Read 1MB, verify, sleep 1 second, etc
- Ran on 3000 rack servers with HW RAID card
- After 3 weeks, they found **152 instances of silent data corruption**
 - Previously thought “everything was fine”
- HW RAID only detect “noisy” data errors
- Need end-to-end verification to catch silent data corruption

Interesting technologies: ZFS

- Zettabyte File System
- Prevents silent data corruption
 - End-to-end integrity
 - Aggressive checksums
- First 128-bit file systems
 - Capacity 1 billion TB
- Instantaneous snapshots
 - Almost zero overhead
 - Easy rollback
- No Volume Manager



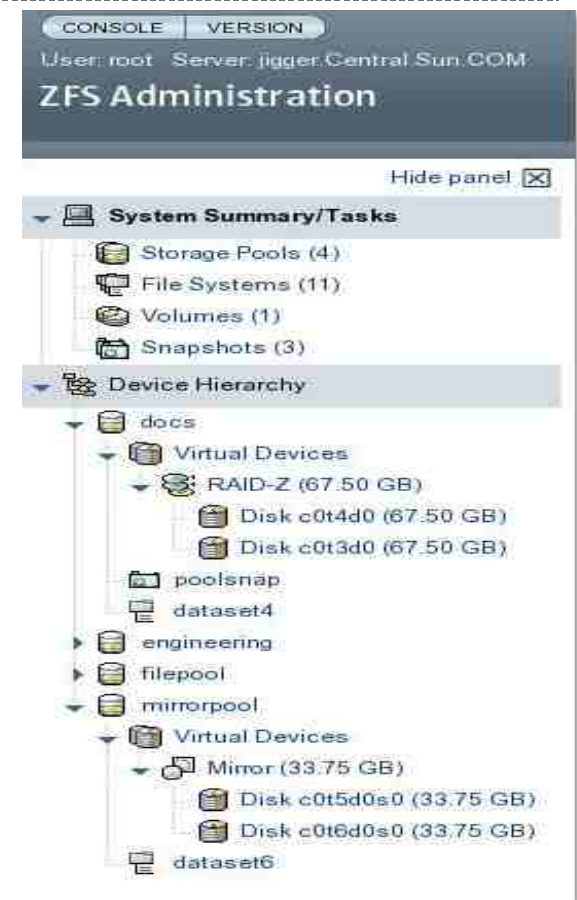
Interesting technologies: ZFS



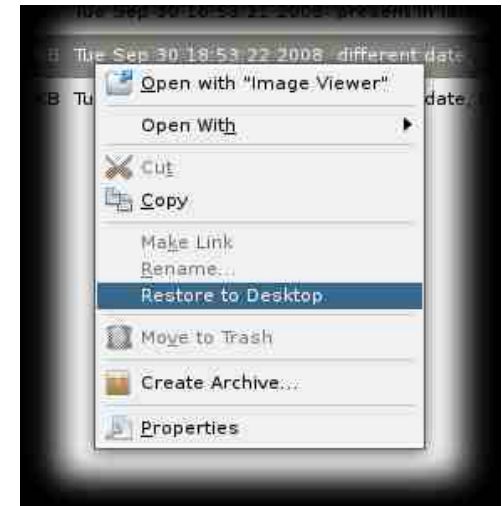
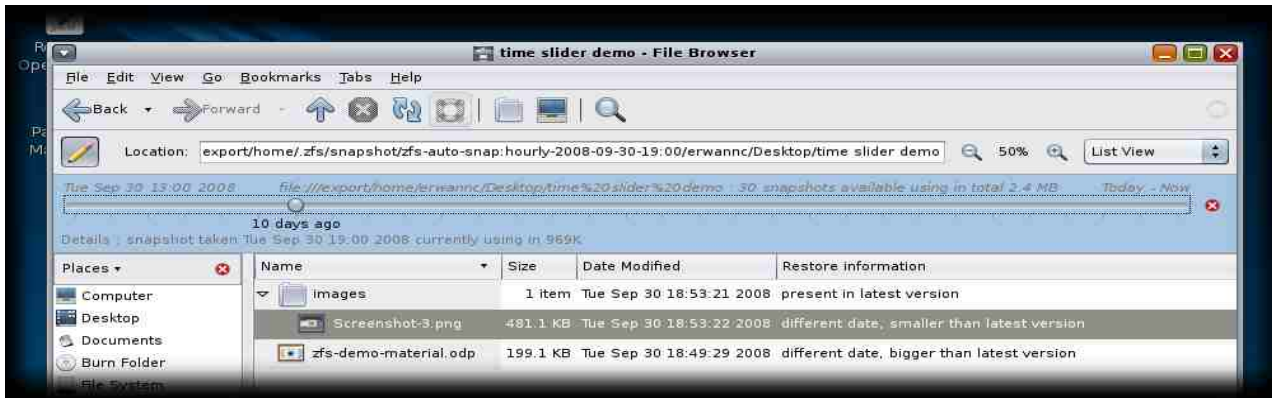
Interesting technologies: ZFS

○ Features in ZFS

- Simple Administration
- Dynamic block size
- Snapshot, Clone, Import/Export
- Compression
- Checksum
- Reservation & Quota
- ACLs
- Built-in NFS & CIFS support
- iSCSI support (target & initiator)
- Built-in many RAID capability: 0, 1, Z, 2Z, 0+1
- Encryption (soon in B100)

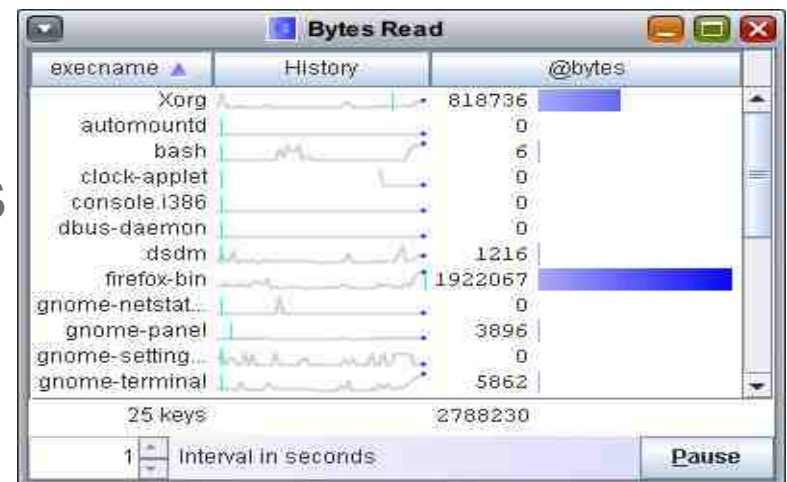


Time Slider (Soon in 2008.11)



Interesting technologies: DTrace

- Dynamic troubleshooting and analysis tool
- Provides observability across the entire software from one tool
- Used for
 - Troubleshooting software bugs
 - Detailed observability
 - Capturing profiling data for performance analysis



Predictive Self Healing

- Breakthrough approach to service availability
 - Error detection & aggregation, auto recovery
- Reduced downtime
 - Components pro actively off lined before failure
 - Automatic service restart
 - Diagnosis & mitigation in milliseconds, not hours
- Reduced complexity
 - Simplified error reporting
 - All system & services interdependencies recorded and correlated
- Reduced costs
 - Reduced system downtime, increased utilization
 - Higher server-to-administration ratio

Predictive Self Healing

- Solaris Fault Manager
 - Detection and diagnosis of errors
 - Isolation or deactivation of faulty components
 - Accurate administrative messaging
- Solaris Service Manager
 - Makes Solaris services self-healing
 - Services are also automatically restarted

Predictive Self Healing in AMD64

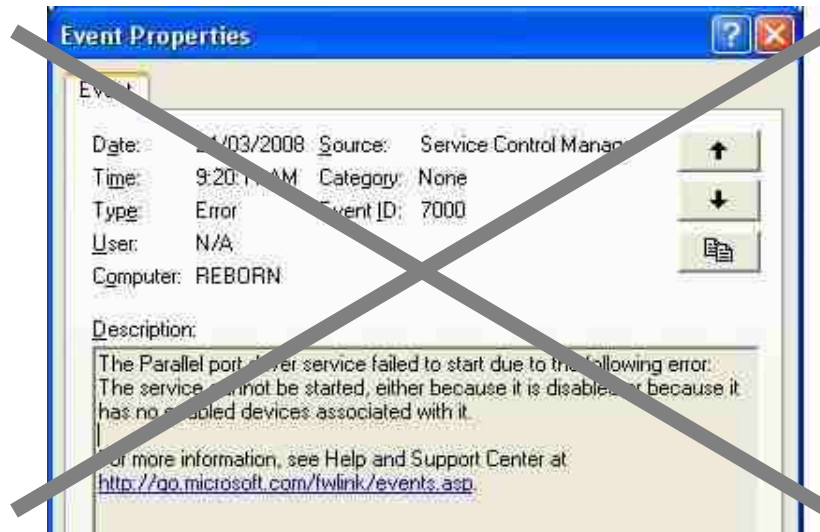
- Support added for CPU and memory errors detected on x64 systems, includes:
 - AMD Athlon 64 & Opteron CPU Errors
 - Northbridge & Hypertransport Links Errors
 - DRAM correctable, uncorrectable, ChipKill errors
- Automatically diagnoses failures
 - Will Attempt to automatically offline or isolate faulty CPU, cache or DRAM memory region
- Support for SNMP notification
 - Publish diagnostics results via Solaris Management Agent, including SNMP
 - Search an SNMP MIB for fault management information

What about Intel?

- There is a movement from Intel and Sun to make enhancement Solaris/OpenSolaris Support on Intel
 - Performance
 - I/O Acceleration
 - Power Management
 - Virtualization
 - Predictive Self-Healing
- http://blogs.sun.com/observatory/entry/opensolaris_intel
- <http://www.opensolaris.org/os/project/intel-platform/>

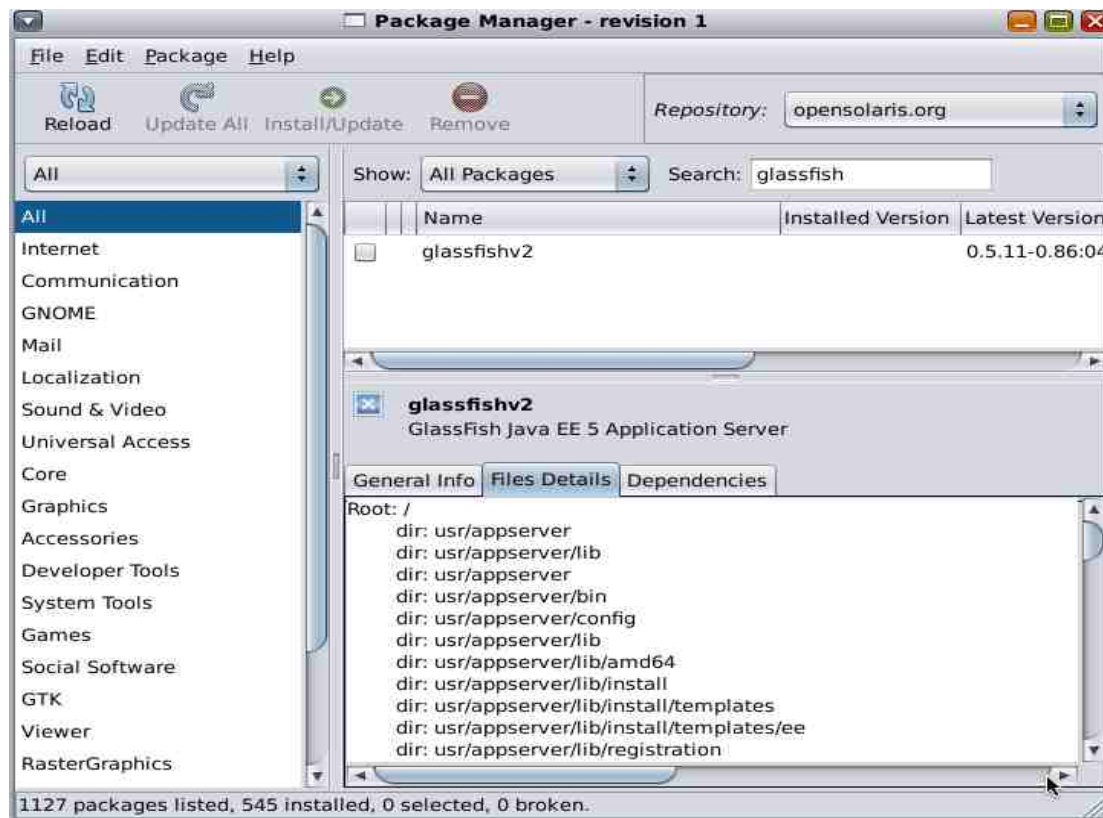
Interesting technologies: SMF

- SMF – Service Management Facility
 - Replaces RC scripts
 - Handles dependencies between services
 - Fault management



Interesting technologies: IPS

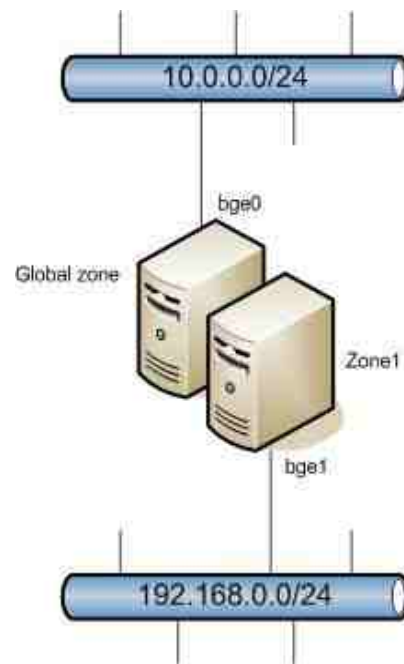
- IPS – Image Packaging System
 - Modern repository-based package delivery



Interesting technologies: Zones

○ Zones/Containers

- Low overhead virtualization
- Example: run many Apaches on 1 server

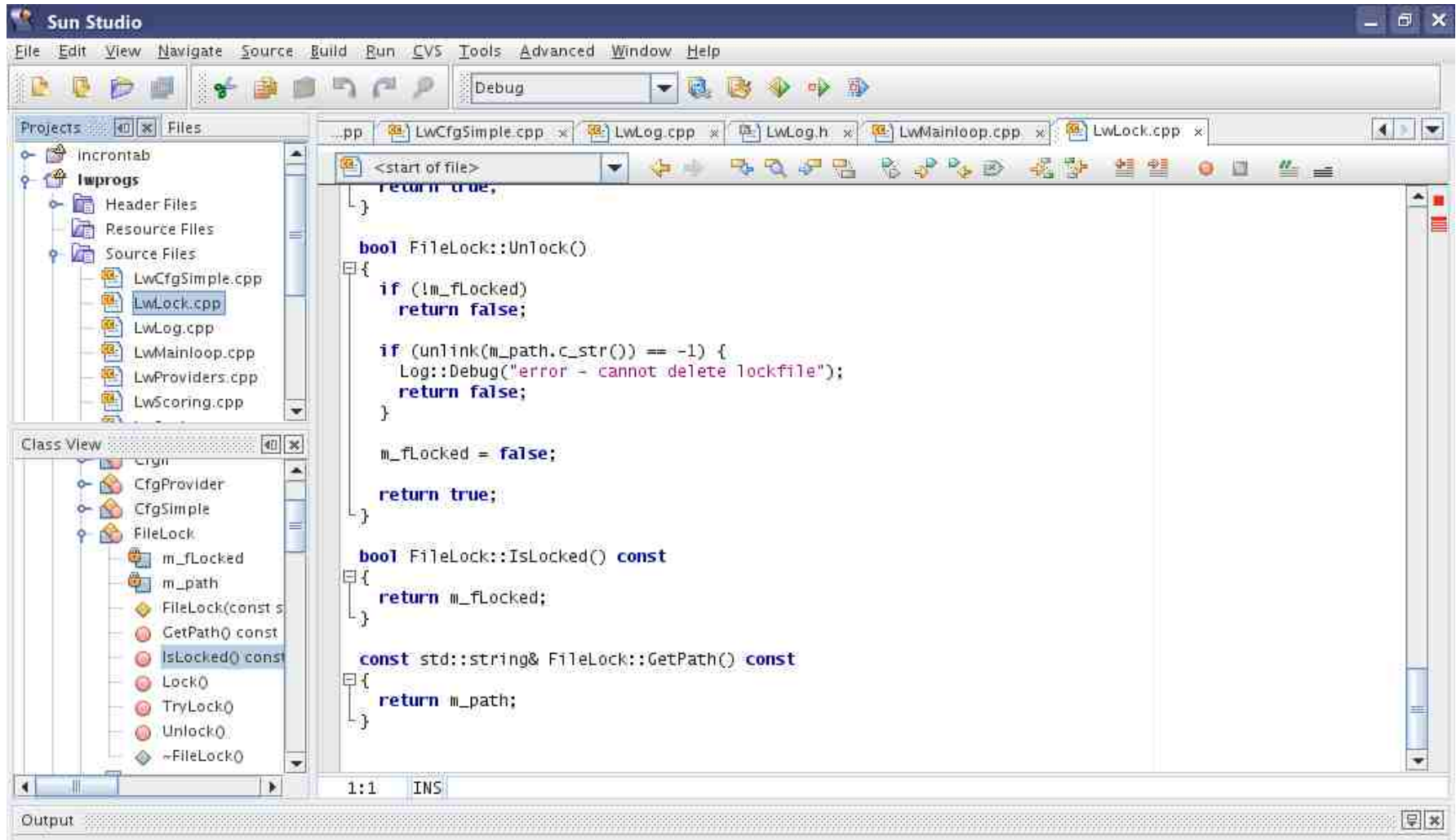


Interesting technologies: CIFS

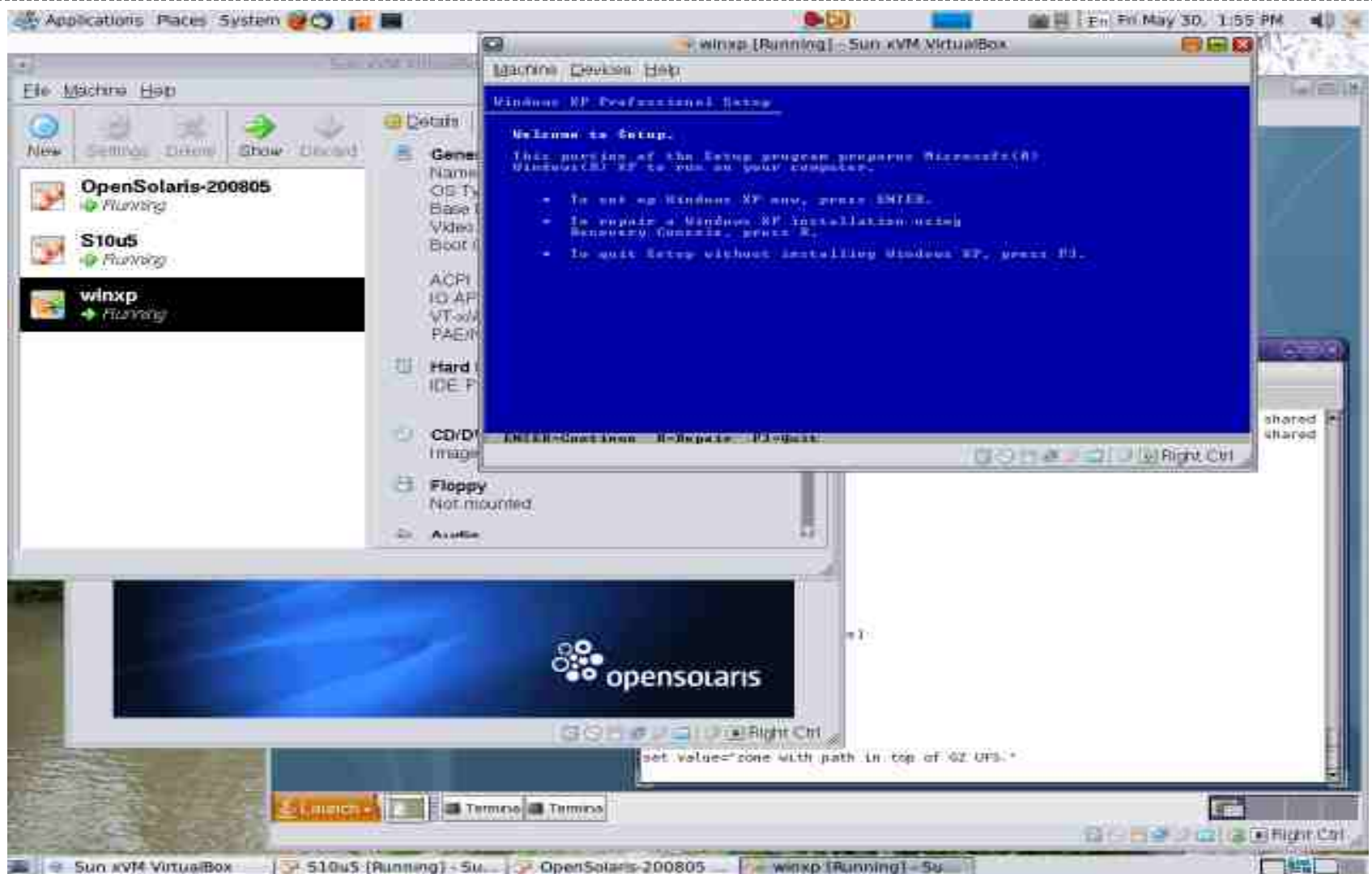
- CIFS support in kernel
 - File sharing with Windows
 - Based on smbfs
- True Windows SIDs
 - Not just POSIX UIDs
- NT-style ACLs



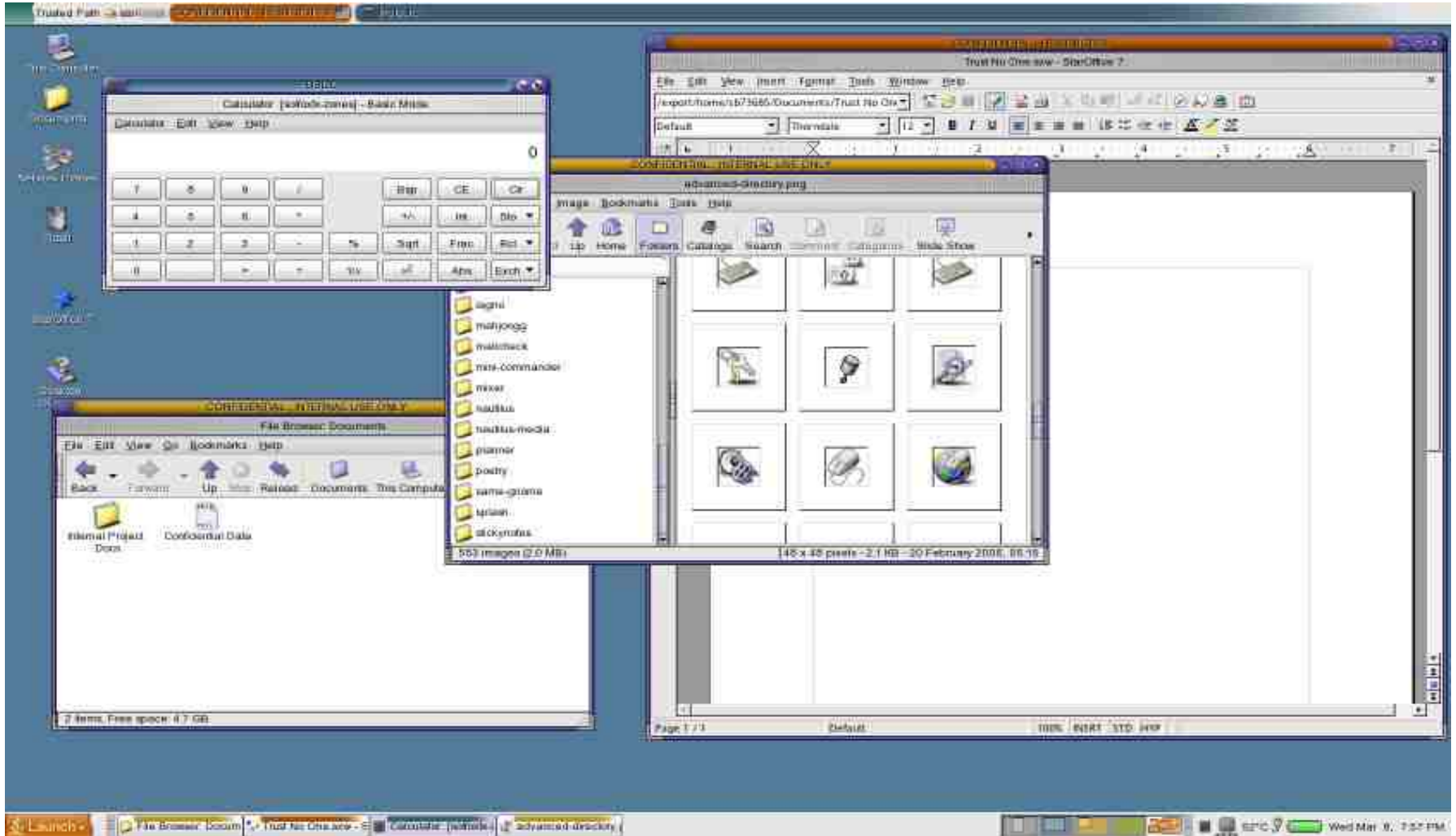
For C/C++ Developers: Sun Studio



Virtualization



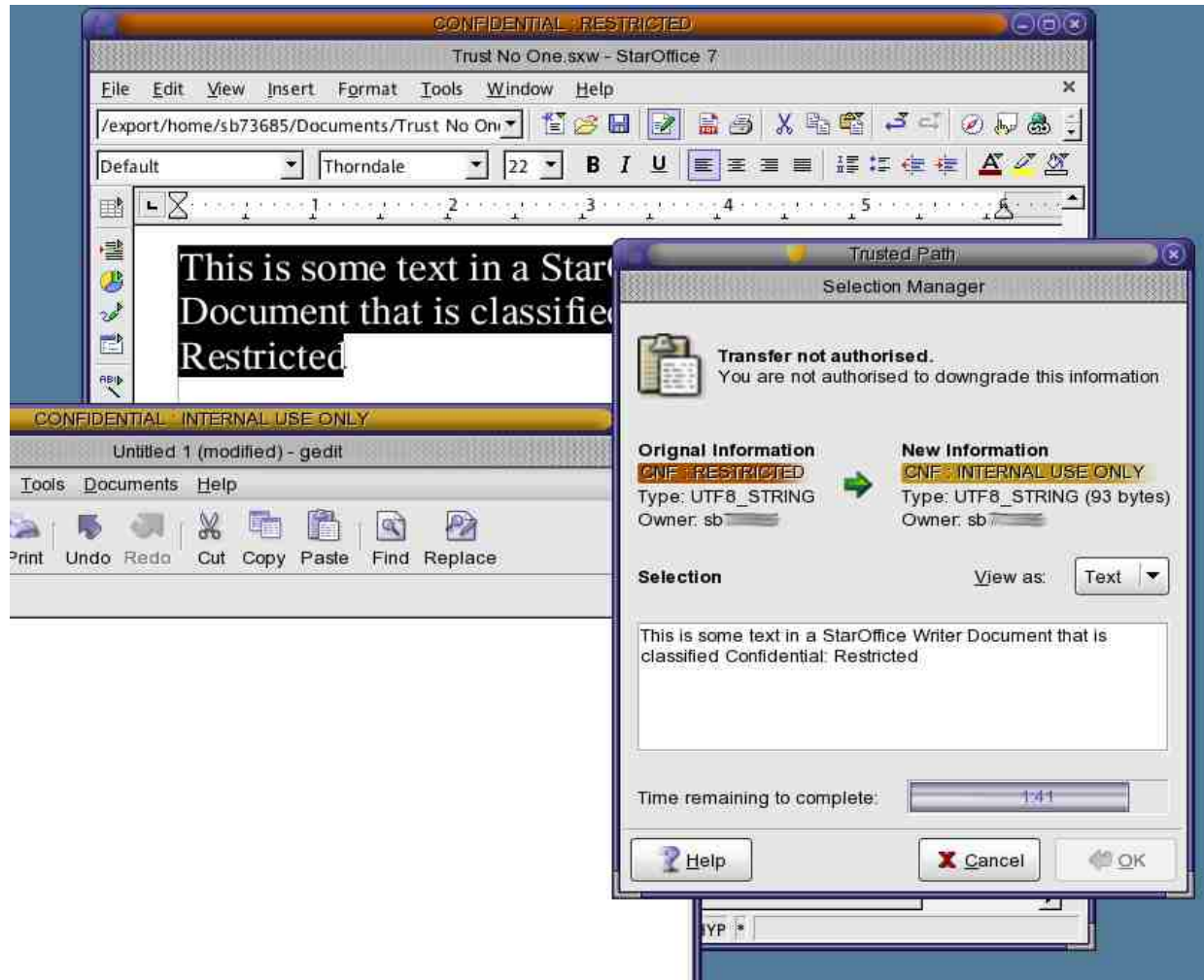
Trusted Extension



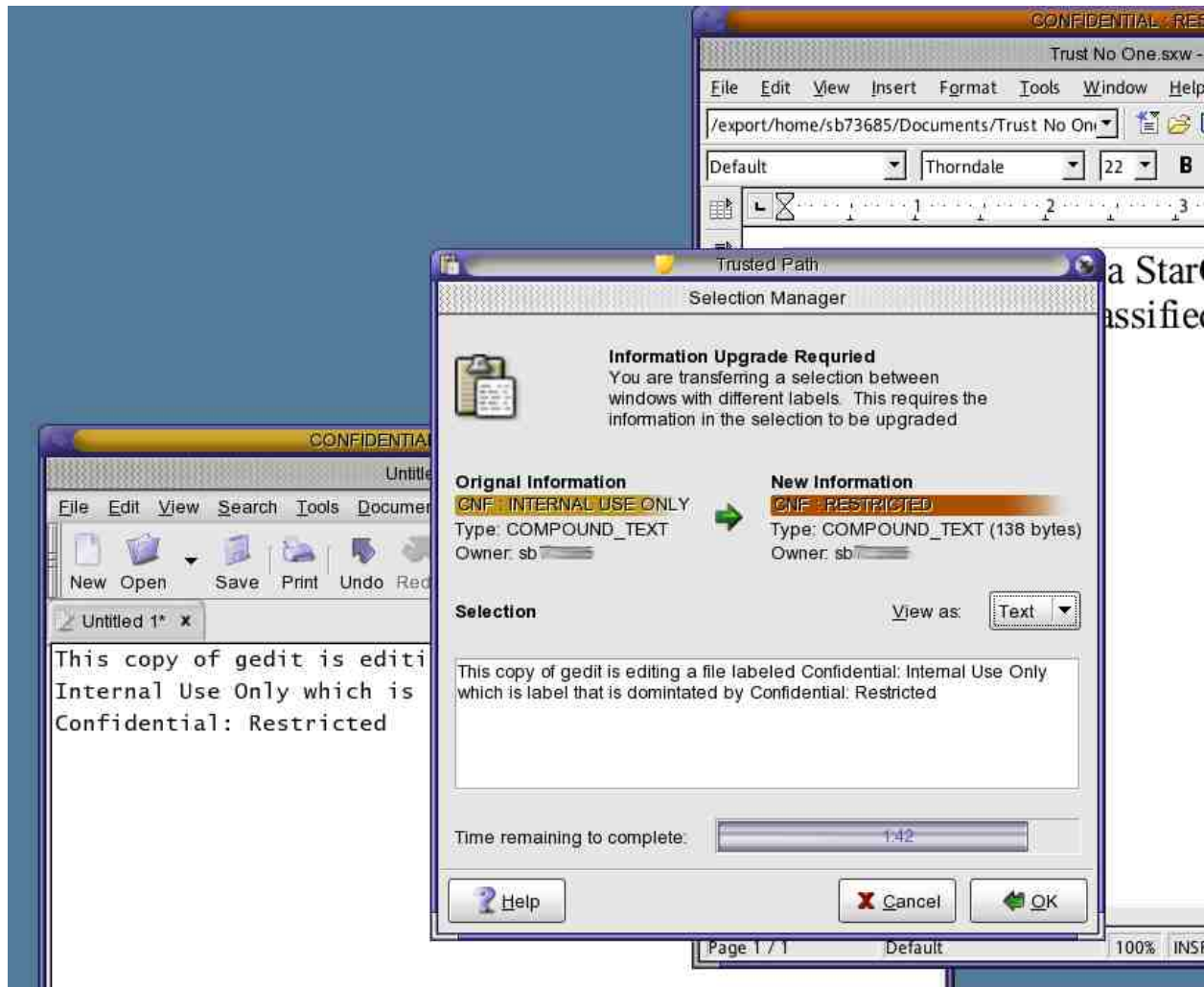
Trusted Extension



Trusted Extension



Trusted Extension



Leverage Solaris core values

- Scalability on large systems



Leverage Solaris core values

- Compatibility for tens of years
- Solaris apps run unmodified on
 - Solaris 8, 9, 10
 - OpenSolaris
 - Any other Solaris-based distribution
- Runs very well on x86 and x64
- Performance
 - Rewritten TCP/IP stacks in Solaris 10
- Security



Thank You...

So Exited.....

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