

Increase Efficiency of Solaris Operations & Hardware Life Cycle

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Oracle ACE Associate „Solaris“

Agenda

- About JomaSoft
- Current Oracle and Fujitsu SPARC CPU & Server
- Solaris Zones & LDoms Technology
- SPARC Server Life Cycle
- Automation and Migration using VDCF
- Customer Migration Projects

About JomaSoft

- Engineering company founded July 2000
- specialized in **Solaris** and software development/integration
- Product **VDCF** (Virtual Datacenter Cloud Framework)
Installation, Management, Monitoring and DR
Solaris 10/11, Virtualize using LDoms
and Solaris Zones
- VDCF is used in production since 2006



Specialized
Oracle Solaris 11



Specialized
SPARC T5-Based Servers



About JomaSoft

- Flexible and Customer focused
- Oracle Certified Employees
- 15 Years Solaris Experience
- Oracle HW & SW Beta Tester
- Well connected with Oracle Solaris & LDOM Engineering Teams

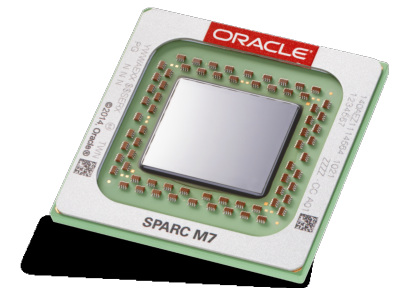


Specialized
Oracle Solaris 11



Specialized
SPARC T5-Based Servers

Oracle SPARC M7 CPU



	SPARC T5	SPARC M7	Improvement
More Cores	16	32	2X
More Threads	128	256	2X
Larger Cache per Core	0.5 MB	2 MB	4X
More Memory Bandwidth	79 GB/s	160 GB/s	2X
Faster Memory Access	163 ns	131 ns	+20%
More I/O Bandwidth	32 GB/s	145 GB/s	4X
Faster Processor Frequency	3.60 GHz	4.13 GHz	+15%

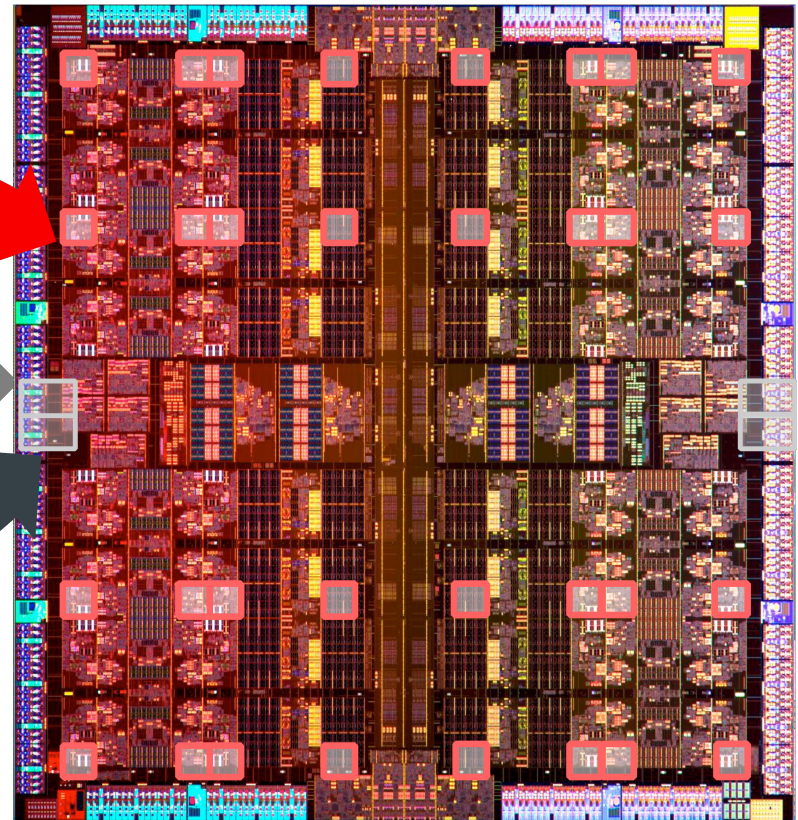
Oracle SPARC M7 CPU



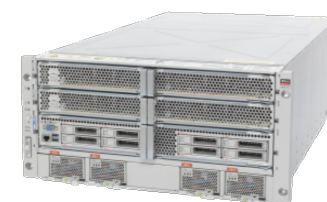
Security in Silicon:
Silicon Secured Memory
Cryptography Acceleration

SQL in Silicon:
Database In Memory Accelerator Engines

Capacity in Silicon:
Decompression Engines



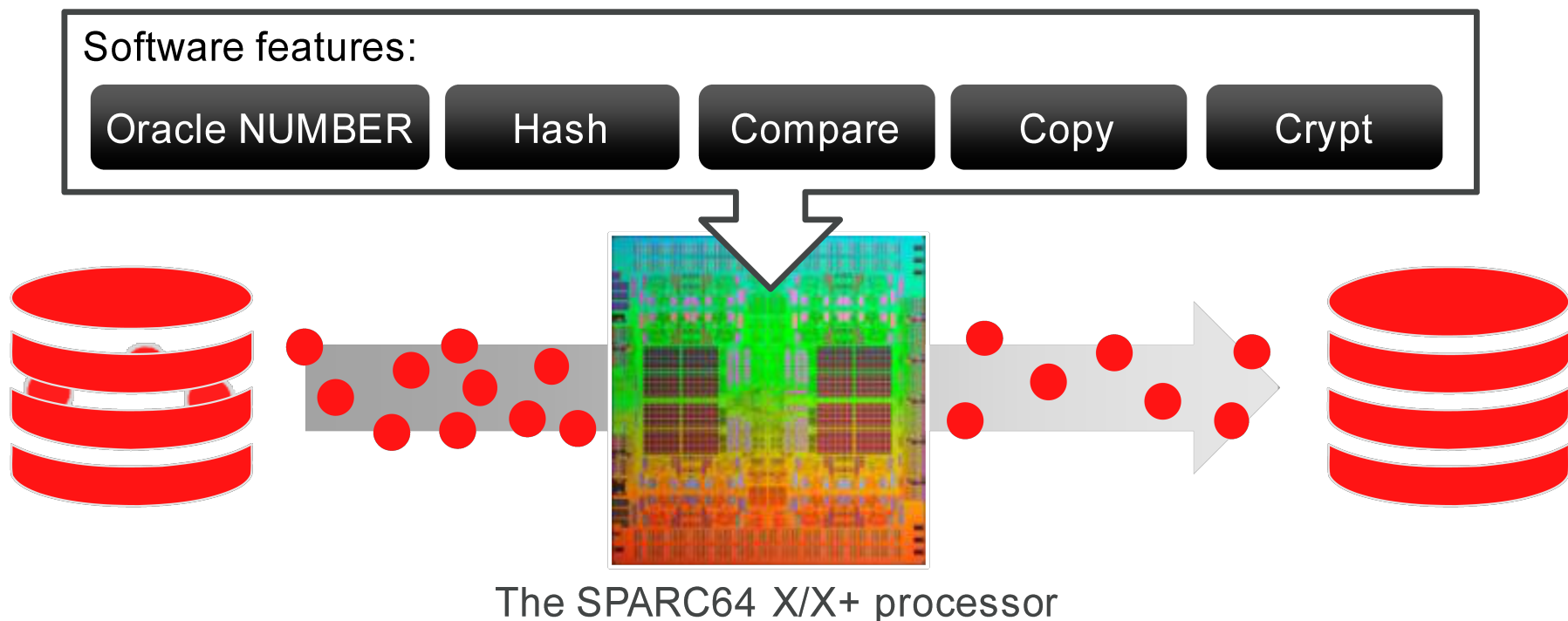
Oracle SPARC T7 Server



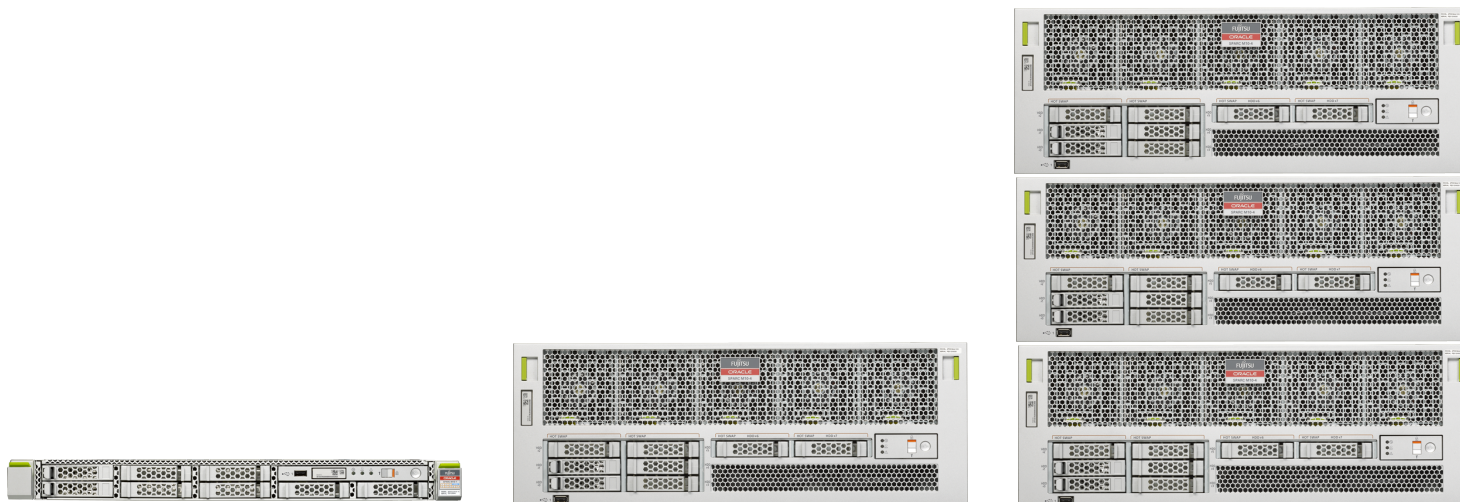
	T7-1	T7-2	T7-4
CPU	1	2	2 or 4
Cores	32	64	64 or 128
Threads	256	512	512 or 1024
Max Memory	500 GB	1 TB	Up to 2 TB
Size	2 RU	3 RU	5 RU

Fujitsu SPARC M10 CPU

- Software on Chip (SWoC)
- Core activation using licenses
- Good single thread performance – same level as the M7 CPU
- Large cache (24MB L2)



Fujitsu SPARC M10 Server



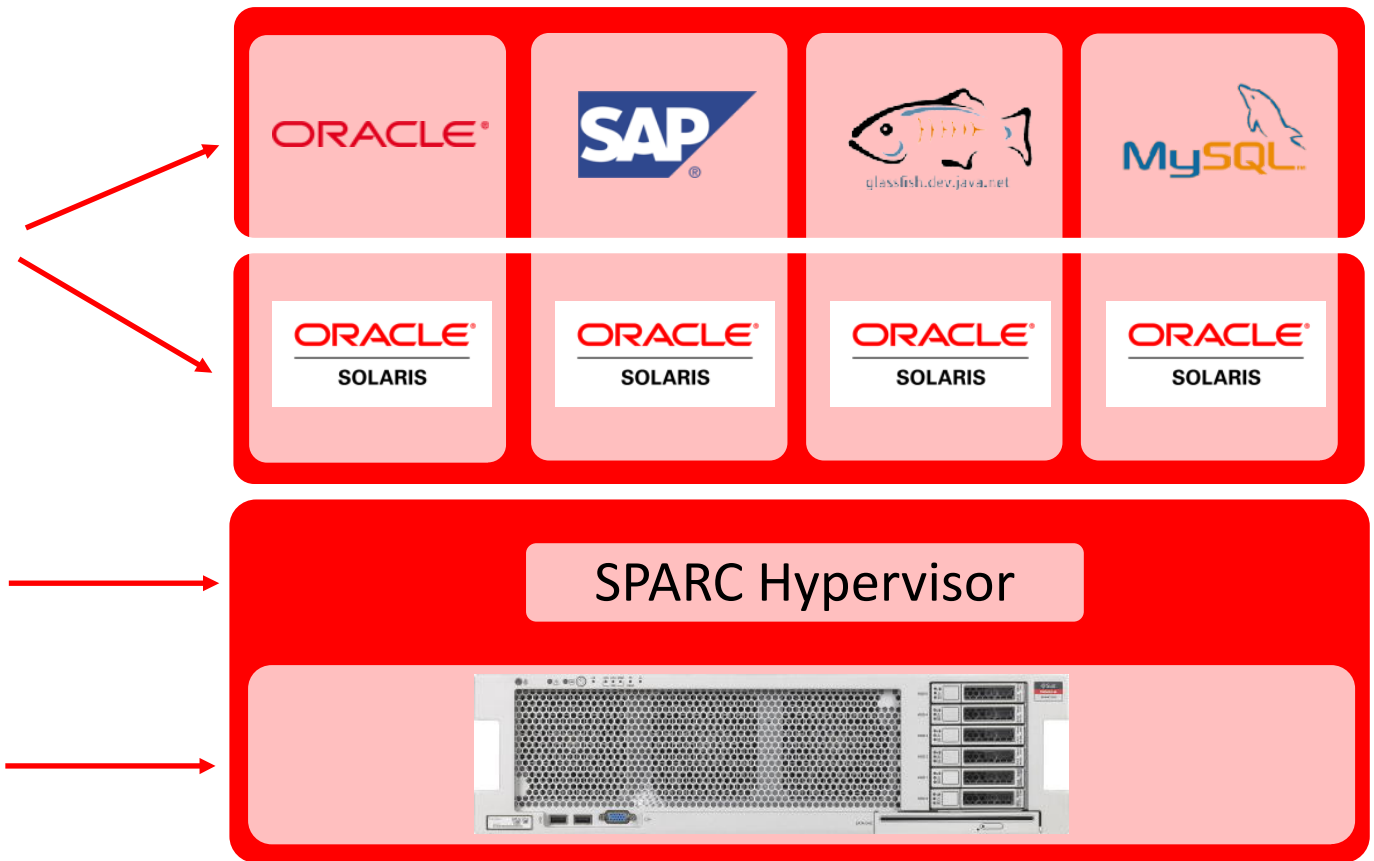
	M10-1	M10-4	M10-4S
CPU	1	4	4 - 64
Cores	8 (3.7 GHz) or 16 (3.2 GHz)	32 (3.7 GHz) or 64 (3.4 GHz)	Up to 1024
Threads	16 or 32	Up to 128	Up to 2048
Max Memory	1 TB	2 TB	Up to 64 TB
Size	1 RU	4 RU	4 RU per Unit

Oracle VM Server for SPARC

Isolated Operating System and Application in each Logical Domain

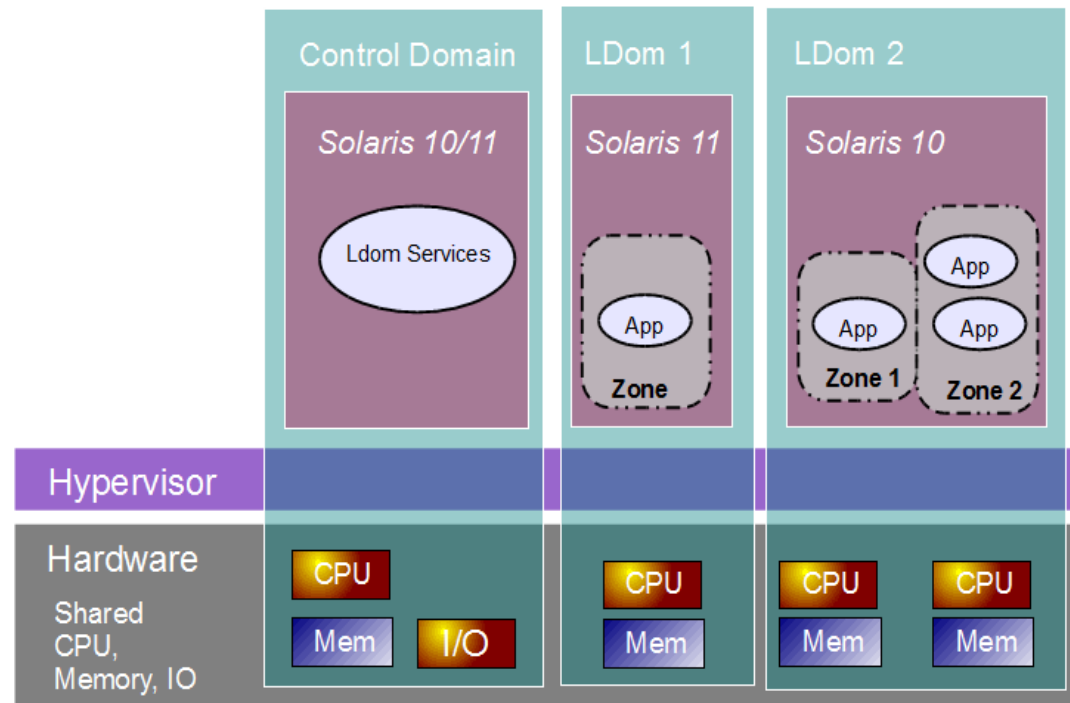
Firmware based Hypervisor

Each Logical Domain uses dedicated Memory and CPU Threads
→ Zero Overhead



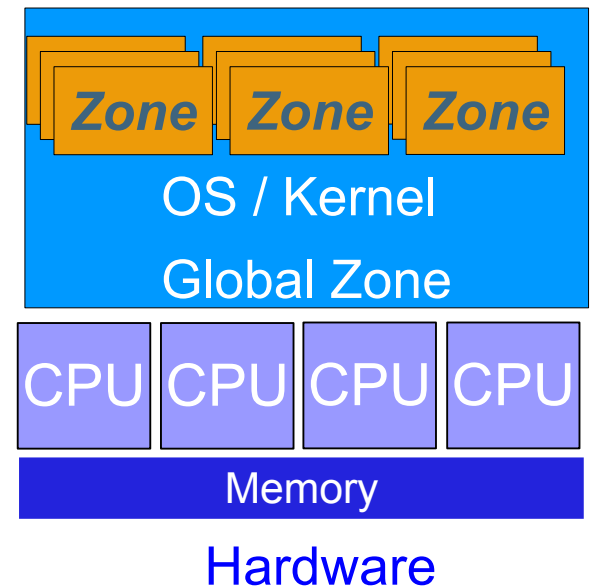
Logical Domains (LDoms)

- „Only“ on Oracle & Fujitsu SPARC CMT Server
Systems: T5xx0, T3-x, T4-x, T5-x M5, M6, M10, T7/M7
- Multiple, separated Solaris instances on one hardware
- Individual Updates
- Combine with Solaris Zones
- Live Migration
- No costs (just built into the SPARC Server)

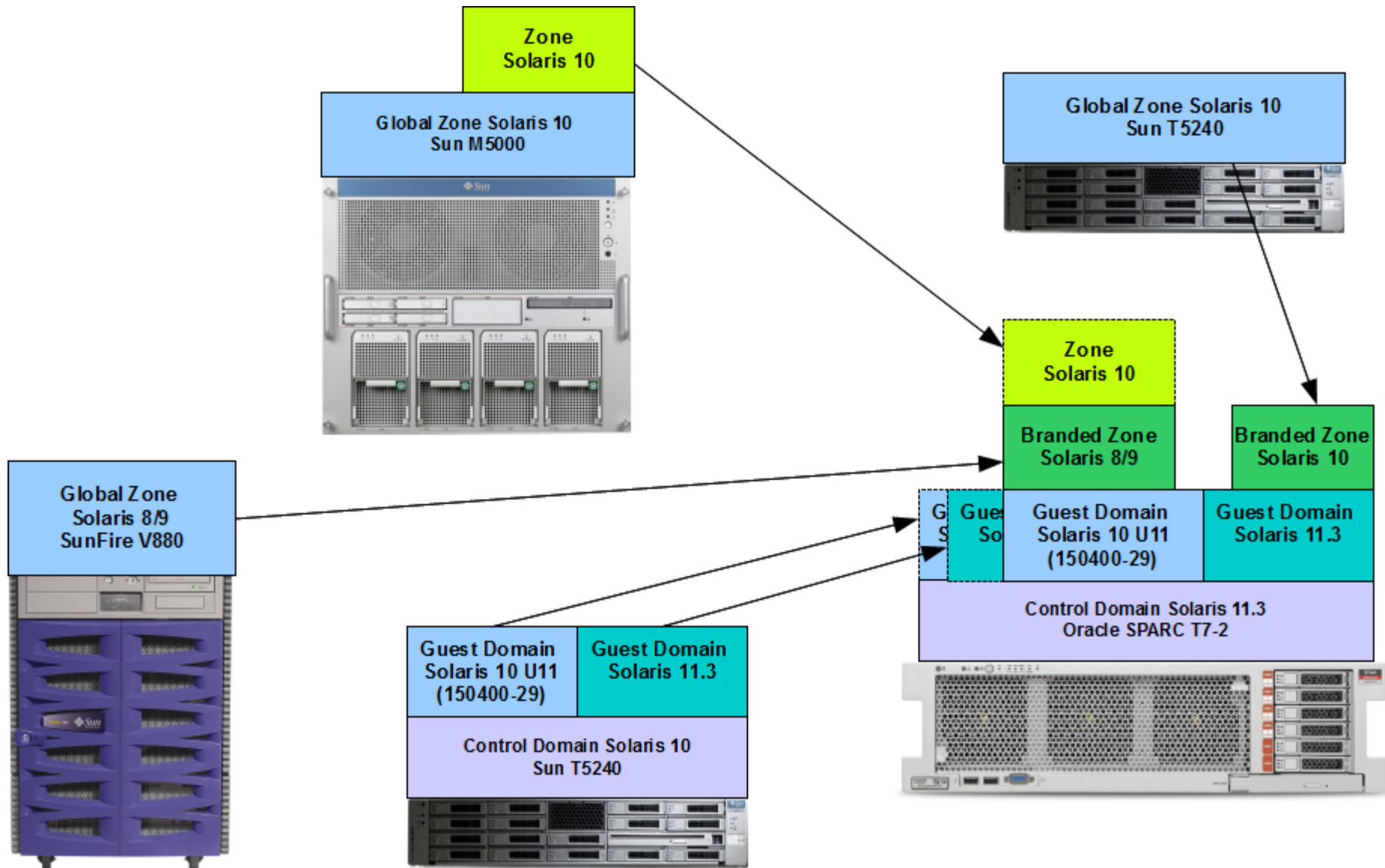


Solaris Zones – Your virtual Environments

- 1 Kernel
- HW Resources shared
- Zone = Application environment
- Processes are isolated
- Very efficient
- Proven technology (available since 2005!)
- Our customers run thousands of Zones
- Container = Zone



SPARC Server Life Cycle



How to Operate & Migrate successfully

- Use LDoms to consolidate s10/s11 on the same HW
- Always install applications into Zones for flexibility
- Storing everything on central storage makes migrations easy
- Standardize / avoid variants
- Automate, automate, automate
 - Avoid errors
 - Makes sure you fulfill your standard
- Reduce manual setup
- Separate application data and OS

Doing it manually?

LDoms

ldm add-vsw, add-vds, add-vcc

ldm create, modify

ldm set-memory

ldm set-vcpu, set-core

ldm set-var

ldm add-vnet

ldm add-vdsdev, add-vdisk

ldm list-bindings

ldm bind

ldm remove-config, add-config

ldm start

ldm migrate

virtinfo

Network

dladm create-aggr

dladm create-vlan

dladm set-linkprop

ipadm create-ip

ipadm create-addr

ipadm create-ipmp

ipadm set-ifprop

ifconfig

route

ZFS

zpool create

zpool set

zpool add

zpool status

zpool attach, detach

zpool import, export

zfs list

zfs create

zfs set

zfs mount

zfs snapshot

IPS Packages

pkg list

pkg install

pkg update

pkg search

pkg publisher

pkg set-publisher

pkgsend publish

Zones

zonecfg create

zonecfg set zonepath

zonecfg set autoboot

zonecfg add anet

zonecfg set lower-link

zonecfg add fs

zonecfg set type

zonecfg set dir

zonecfg set special

zonecfg add dataset

zonecfg add device

zonecfg set rctl

zonecfg info

zoneadm list

zoneadm install

zoneadm boot

zoneadm apply

zoneadm detach, attach

IPS Repo

pkgrepo create

pkgrepo list

pkgrepo rebuild

pkgrepo refresh

Installation

installadm create-service

installadm create-client

installadm create-manifest

installadm update-manifest

installadm create-profile

installadm validate

installadm set-criteria

SMF Services

svccfg

svcadm

svcs

Disk

luxadm probe

luxadm display

format

devfsadm

cfgadm

mpathadm

swap

And More

Plain Config Files

XML Files

.. Solaris 10 commands ...

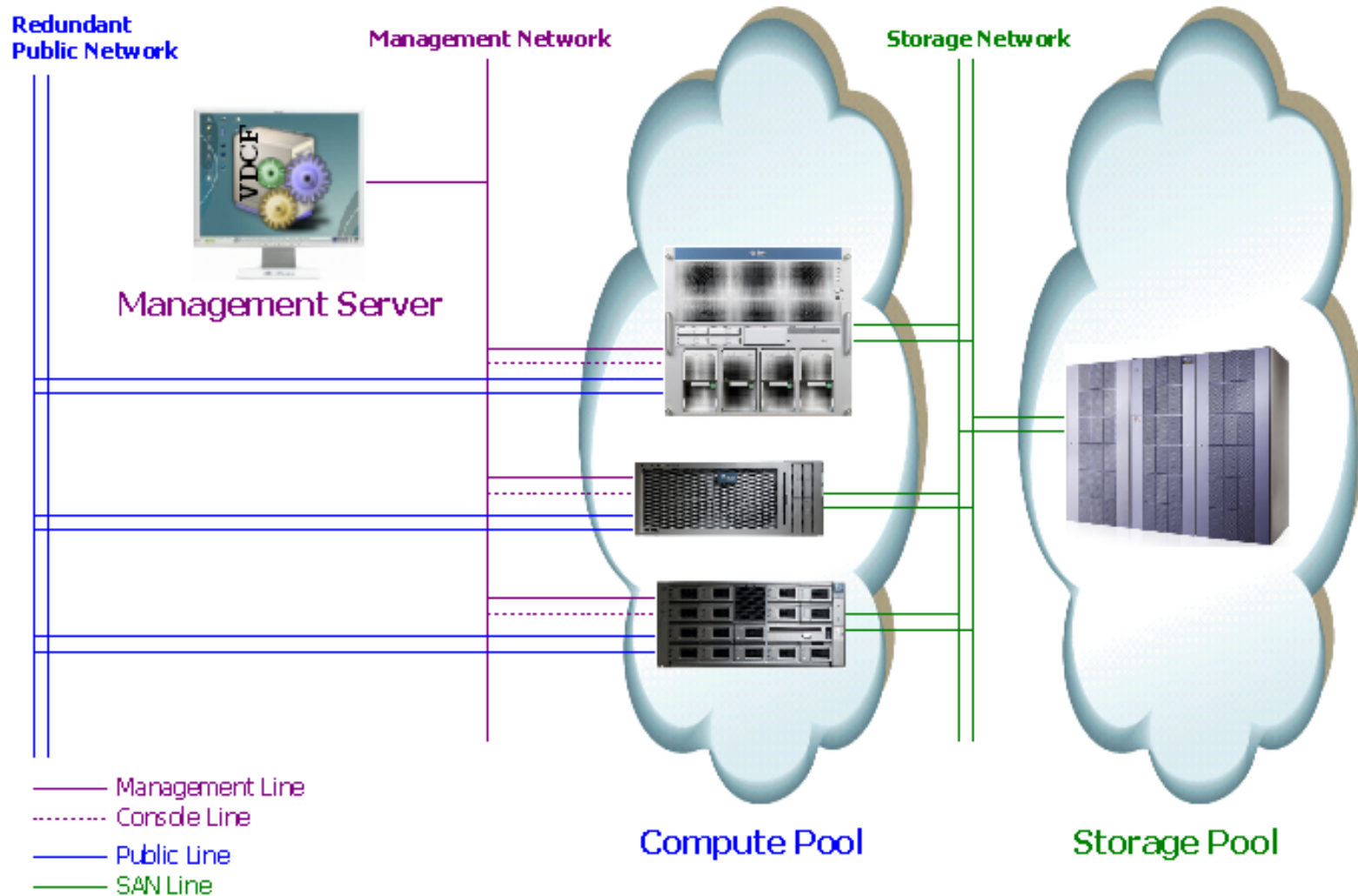
VDCF – Virtual Datacenter Cloud Framework

- Management Tool for Zones and LDOMs
Installation, Operation, Migration,
Monitoring and Failover
- Supports Solaris 10 + 11 on SPARC/x86
- In productive use since 2006
- Dynamic Virtualization
Live / Cold Migration and Failover
- Resource Configuration and Monitoring
- Agility for your Enterprise Private Cloud
- For Admins: CLI / no GUI

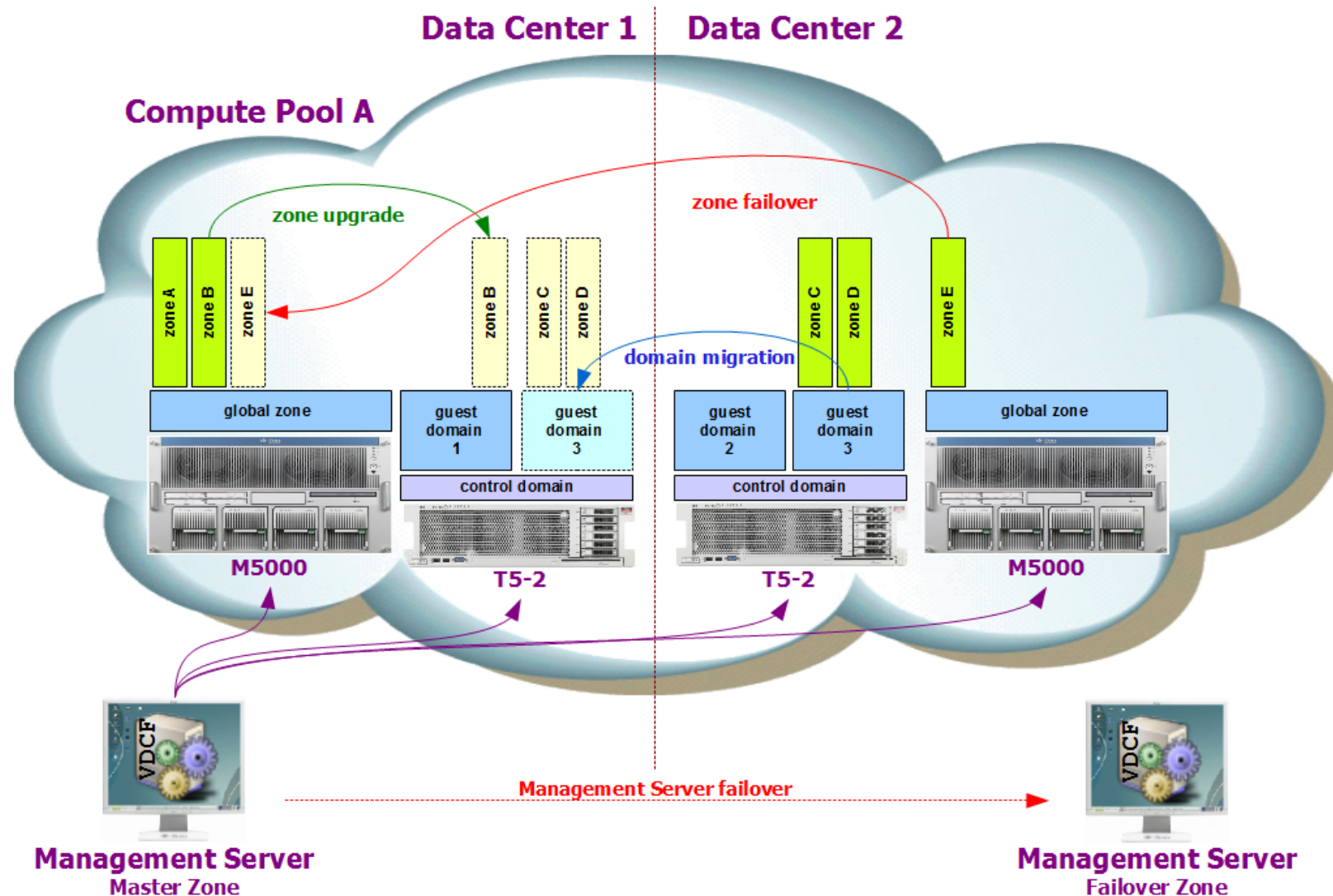
VDCF - Goals

- **Central** view and control of the virtual data center
- **Standardization**: uniform System configuration
- As **easy** as possible for the System administrator
- Consistent interfaces for admins (Solaris 10 and 11)
- Avoid mistakes: Fully **automated** Installation & Migration
- **Flexible**: Hardware can be mixed, VDCF adapts the configuration when migrating
- Reduce Complexity: Layer above Solaris / Hide the details
- „Best Practices“ are integrated ongonig into the product
- Cheap and easy solution for failover and DR

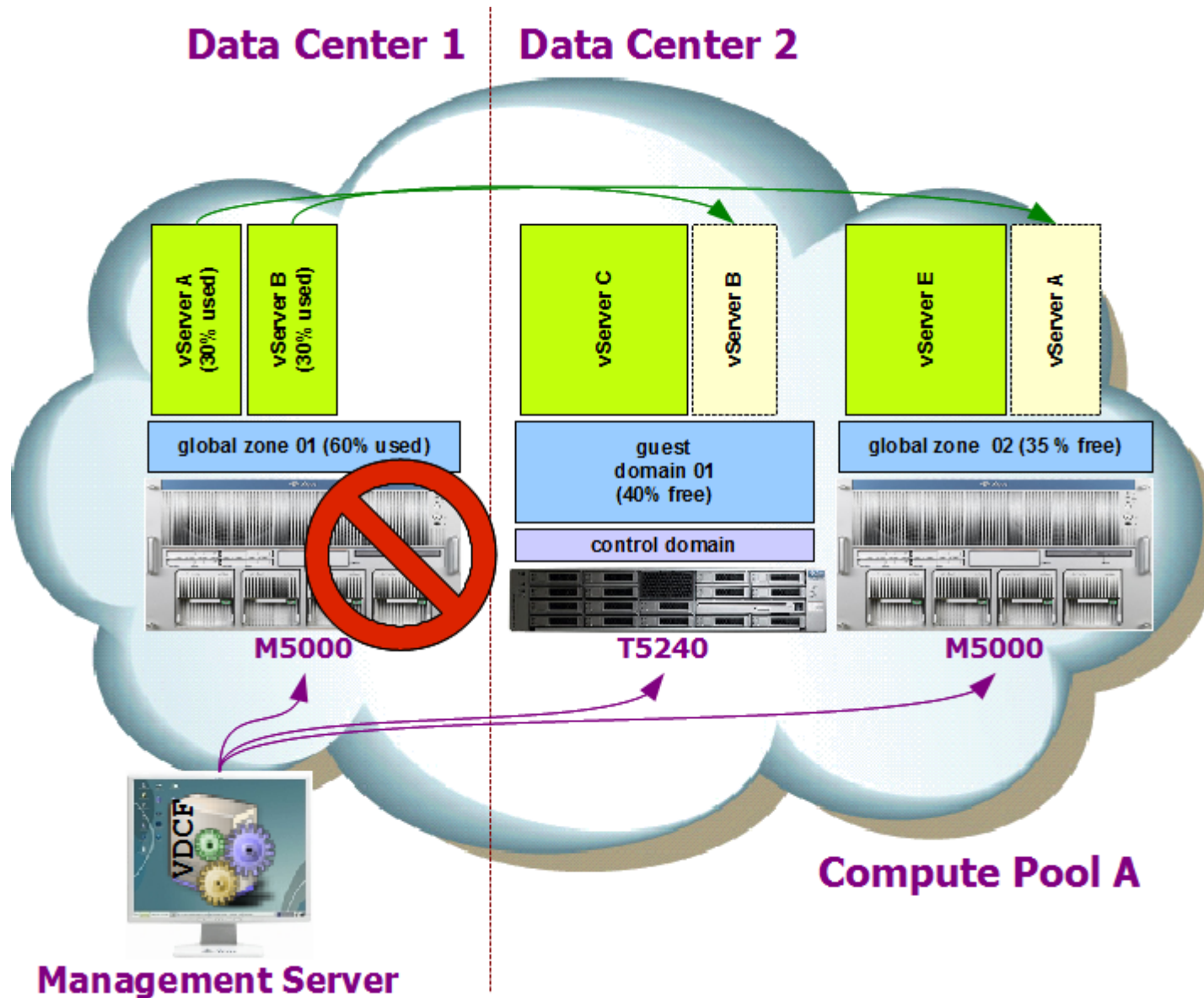
Enterprise Private Cloud Architecture



Dynamic Virtualization



VDCF – High Availability



VDCF - Usage samples

- Node Install

```
node -c enable_install name=LDomA build=s11_2_6
node -c install name=LDomA
```

- Guest Domain Definition

```
gdom -c create name=LDomB cores=4 ram=16g cdom=myT7
```

- vServer (Zone) Operations

```
vserver -c addfs name=server1 mountpoint=/myDatabase
dataset=server1_db size=2g
vserver -c commit name=server1 exec
```

- vServer (Zone) Migrate

```
vserver -c migrate name=server1 node=LDomB shutdown
```

VDCF - main benefits

- ✓ easy to use
- ✓ standardize
- ✓ save time
- ✓ deploy faster
- ✓ avoid errors

- **Simplicity**

Deploy and manage Virtual Solaris Environments without a deep Solaris knowledge using only a handful of intuitive VDCF commands

- **Standardization**

Zones and LDoms are deployed using supported Solaris technologies, managed in a standard way and able to be deployed and available for use in minutes rather than hours.

- **Availability / Recovery**

VDCF allows manual or automatic control of server migration or fail-over leading to improved options in availability, disaster recovery and performance.

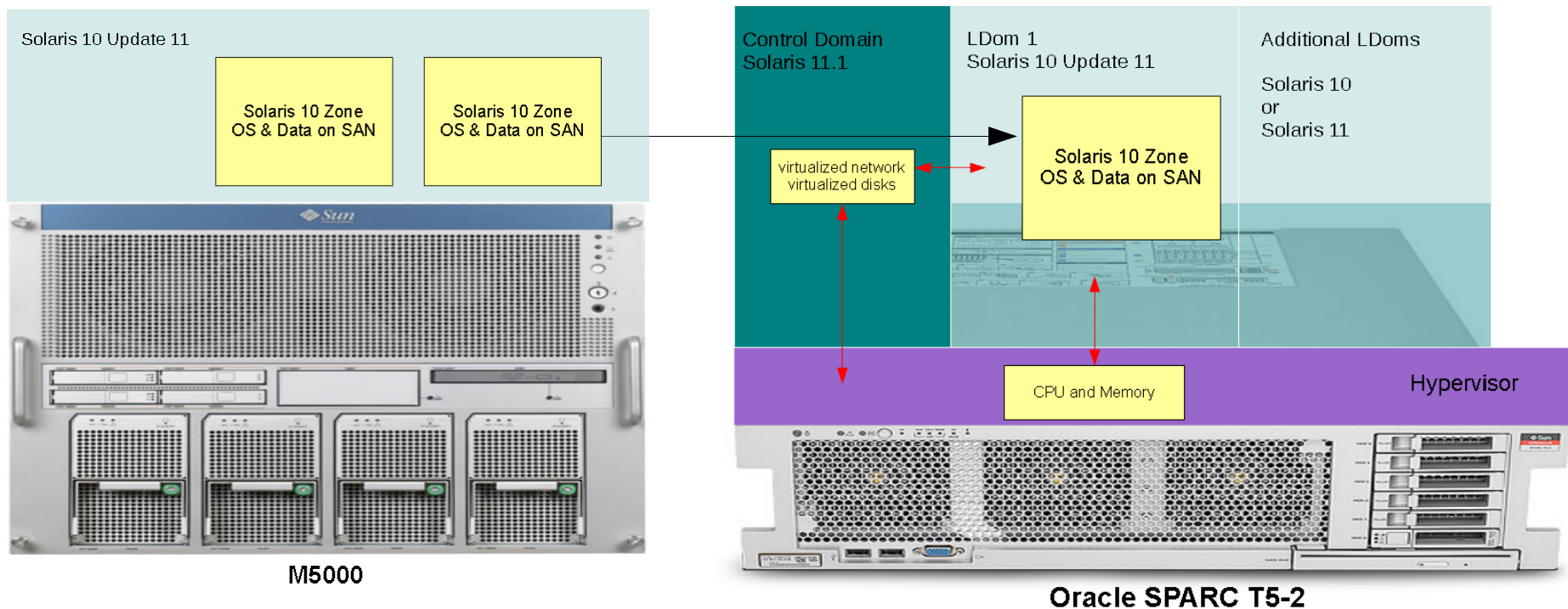
Successful T5 Migration Project



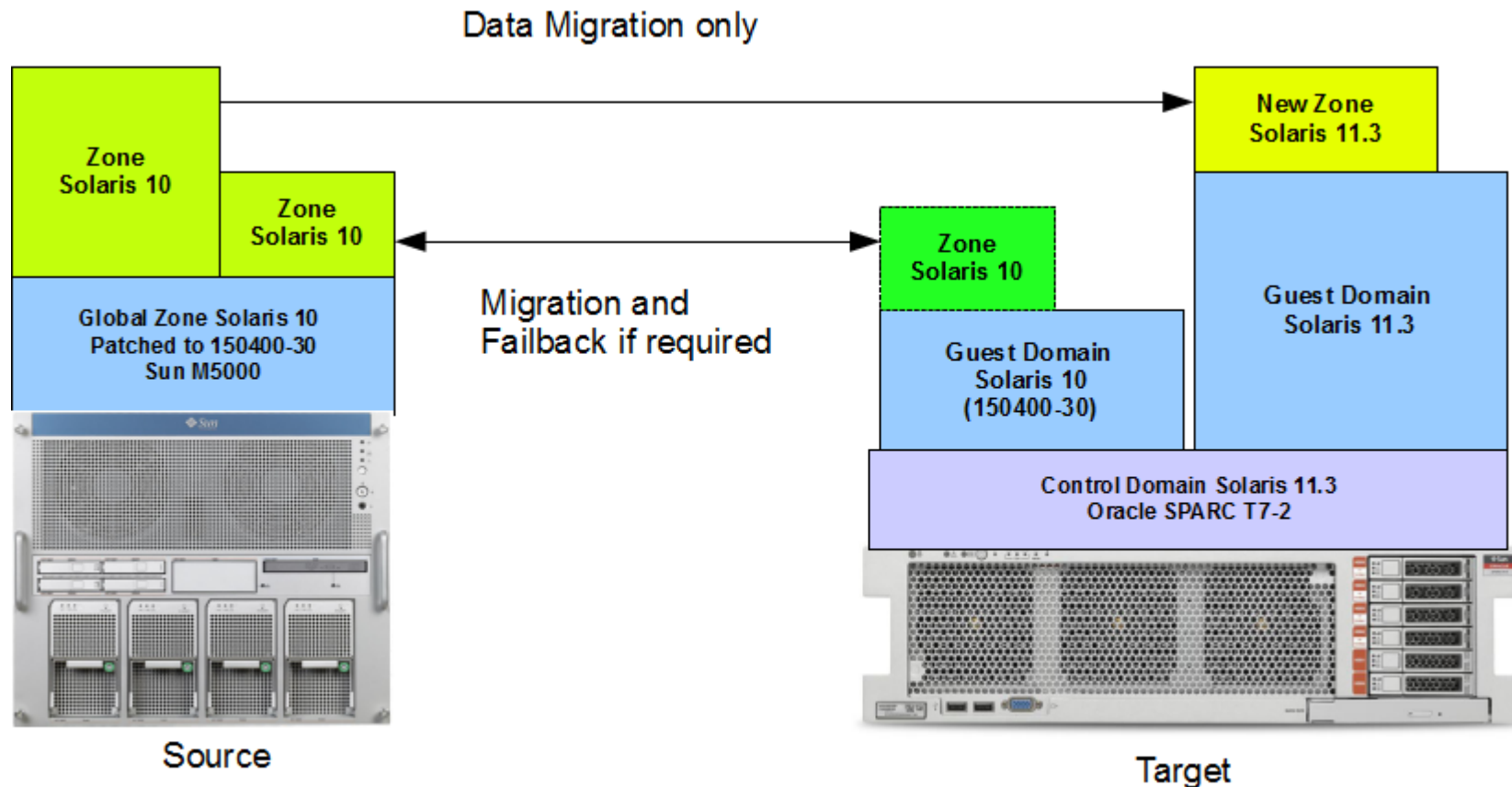
Full process is supported by VDCF

Install new hardware and setup of LDom virtualization

Migrate existing environments to the new hardware



Replace Sun M5000 with SPARC T7-2



Replace Sun M5000 with SPARC T7-2

Project duration

- Hardware order and delivery 4 weeks
- Prepare Solaris 10 Flash 2 days
- Patching old M5000 1 day
- Install VDCF on Solaris 11 1 day
- Setup Hardware 1 day
- Installation CDoms,GDoms,.. using VDCF 1 day
- Migration & Testing 1 day
- Successful projects don't need to take months

Questions?

- **Product white papers, docs and videos online**

<https://www.jomasoft.com/vdcf>

- **Joint POC recommended**

Ending Slide

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Backup Slides

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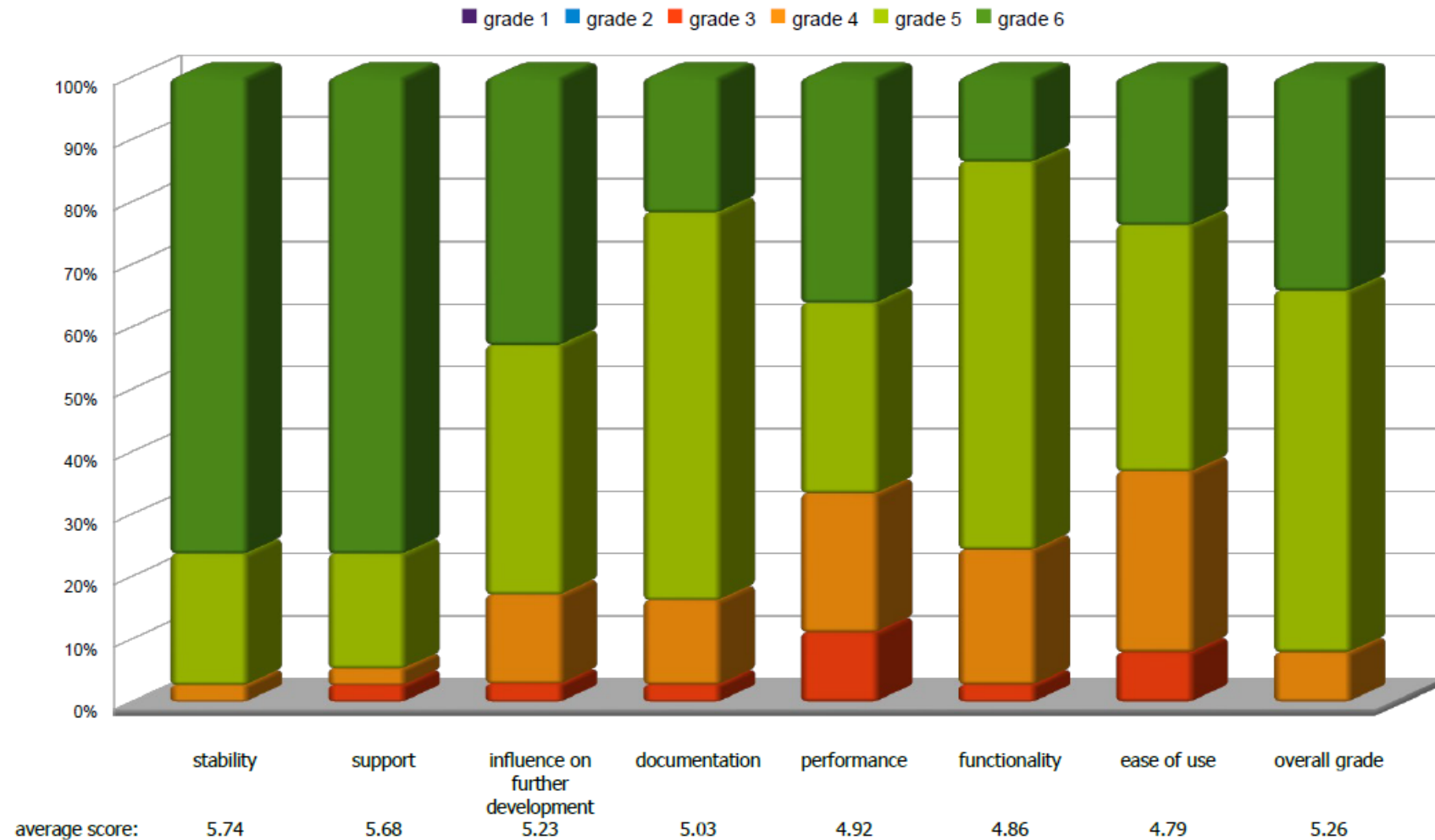
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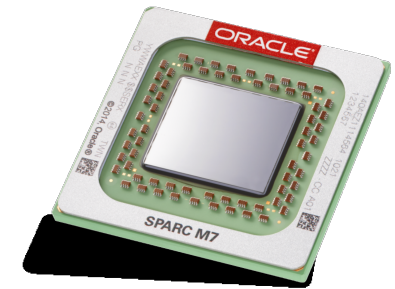
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VDCF Customer Survey

Interpretation: 1 is worst, 6 is best



JomaSoft Performance Compare



Execution Time

VDCF Single Thread Operations

Only 1 Core used!

