

# Increase Efficiency of Solaris Operations & Hardware Life Cycle

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# 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 & S7 CPU



	SPARC T5 Processor	SPARC M7 Processor	SPARC S7 Processor
<b>Processor Cores</b>	16	32	8
<b>Cache per Core</b>	0.5 MB	2 MB	2 MB
<b>Memory Bandwidth per Core</b>	5.0 GB/sec	5.3 GB/sec	6.0 GB/sec
<b>Memory Access</b>	163 ns	131 ns	97 ns
<b>I/O Bandwidth</b>	32 GB/sec	145 GB/sec	32 GB/sec
<b>Processor Frequency</b>	3.60 GHz	4.13 GHz	4.27 GHz

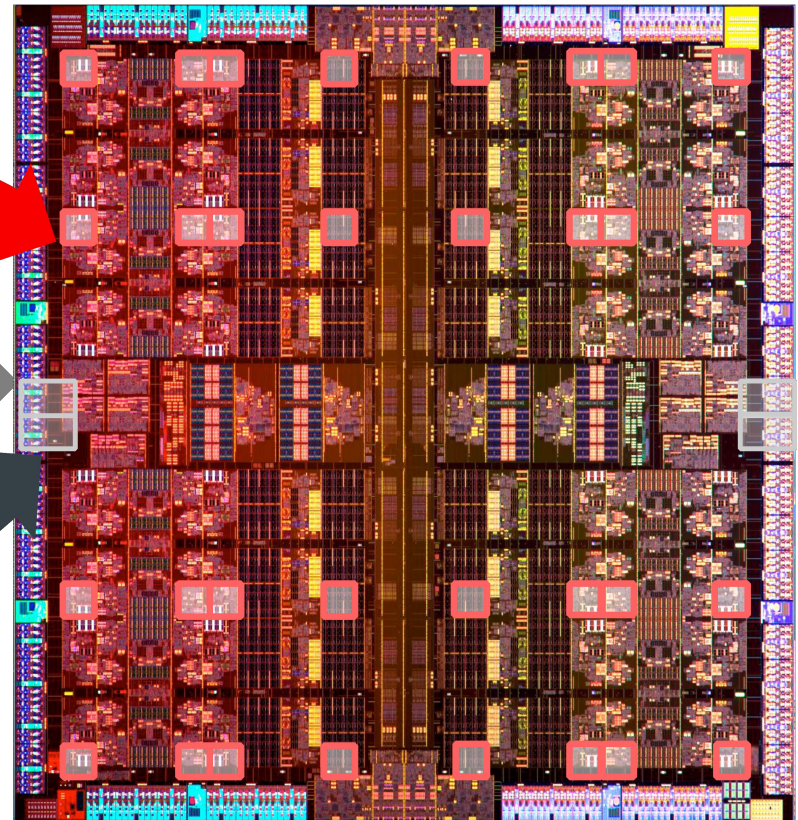
# Oracle SPARC M7 & S7 CPU



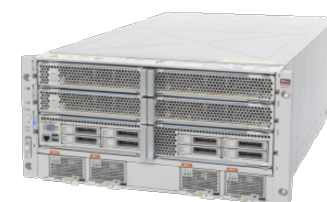
**Security in Silicon:**  
 Silicon Secured Memory  
 Cryptography Acceleration

**SQL in Silicon:**  
 Database In Memory Accelerator Engines

**Capacity in Silicon:**  
 Decompression Engines

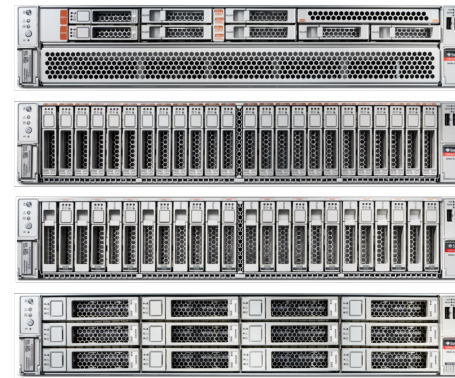
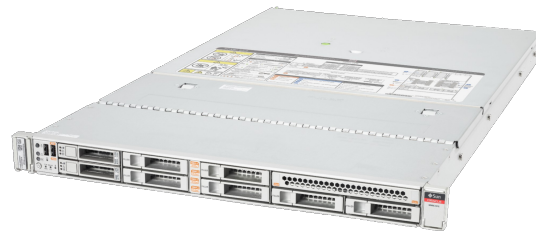


# Oracle SPARC T7 Server



	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	1 TB	2 TB	Up to 4 TB
Size	2 RU	3 RU	5 RU

# Oracle SPARC S7 Server

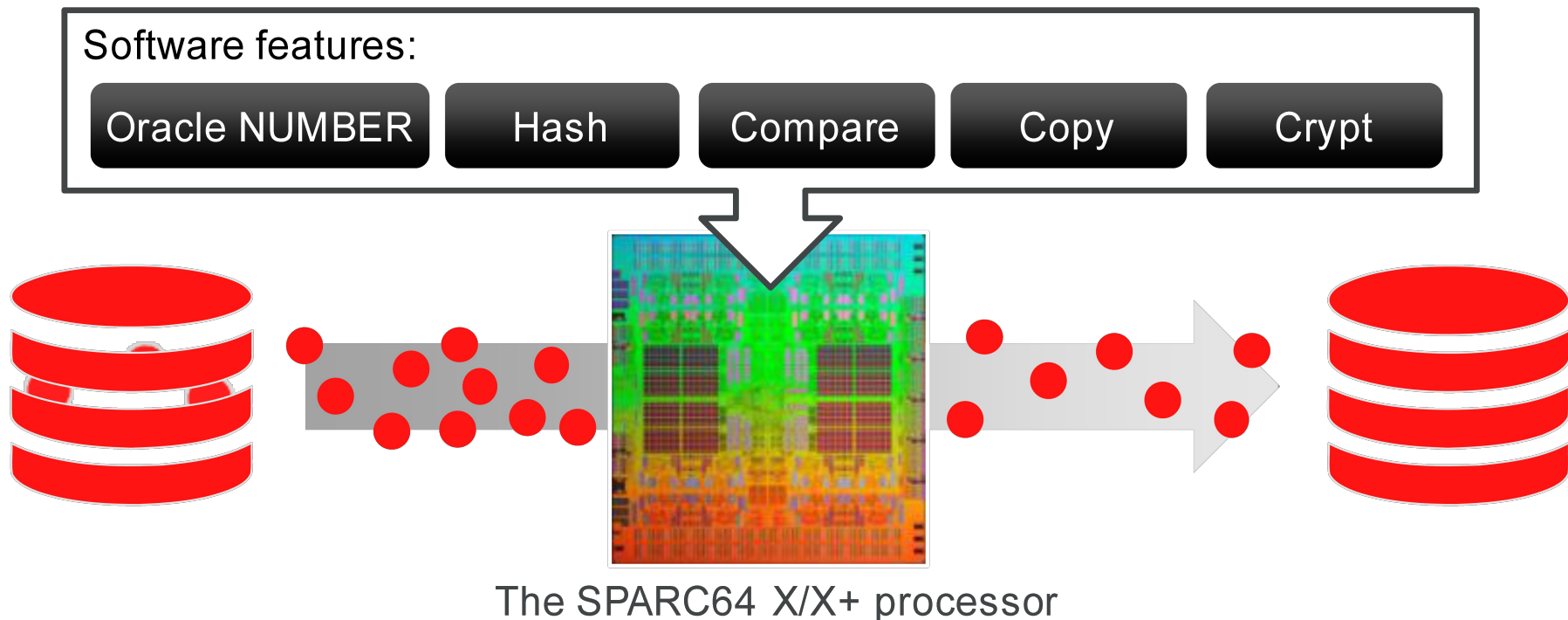


	S7-2	S7-2L
CPU	1-2	2
Cores	8/16	16
Threads	64/128	128
Max Memory	1 TB	1 TB
Size	1 RU	2 RU

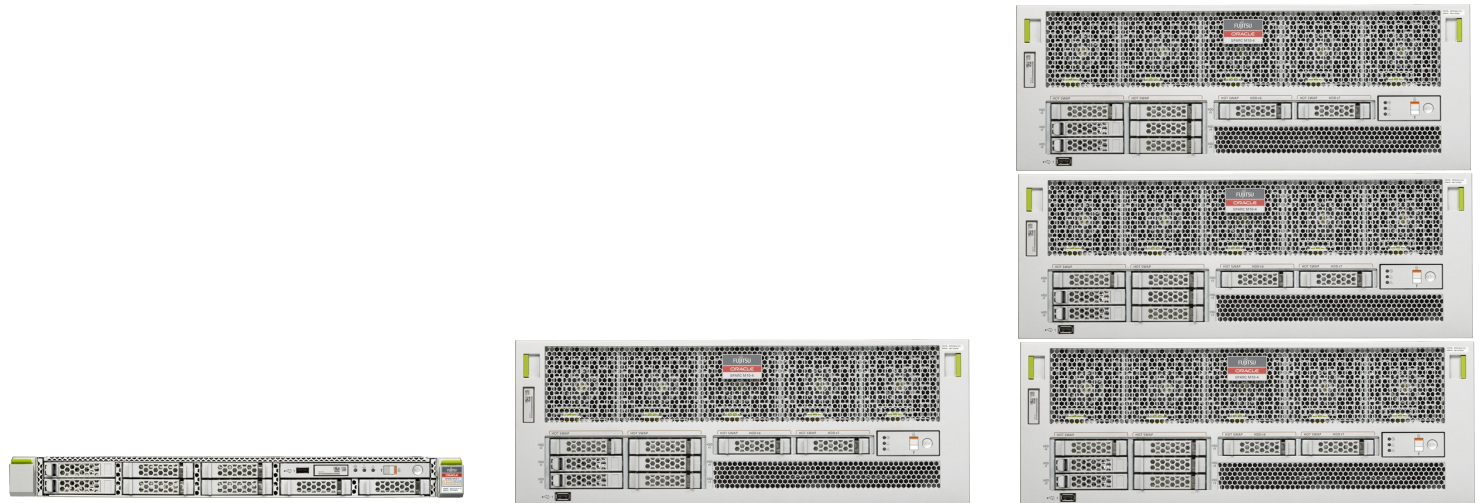


# Fujitsu SPARC M10 CPU

- 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



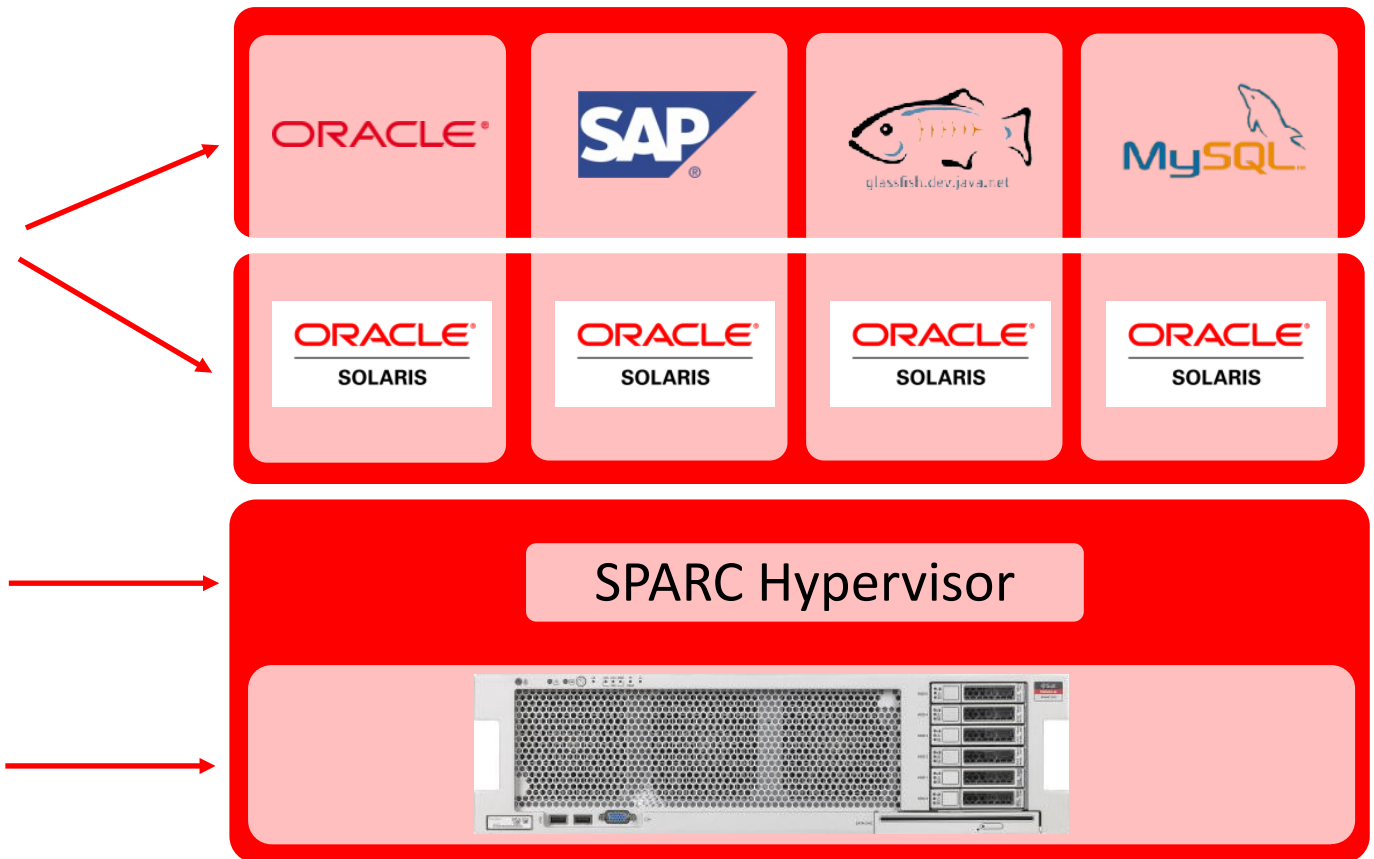
	M10-1	M10-4	M10-4S
CPU	1	4	4 - 64
Cores	8 (3.7 GHz) or 16 (3.2 GHz)	32 (3.7 GHz) or 64 (3.4 GHz)	Up to 1024
Threads	16 or 32	Up to 128	Up to 2048
Max Memory	1 TB	2 TB	Up to 64 TB
Size	1 RU	4 RU	4 RU per Unit

# Oracle VM Server for SPARC

Isolated Operating System and Application in each Logical Domain

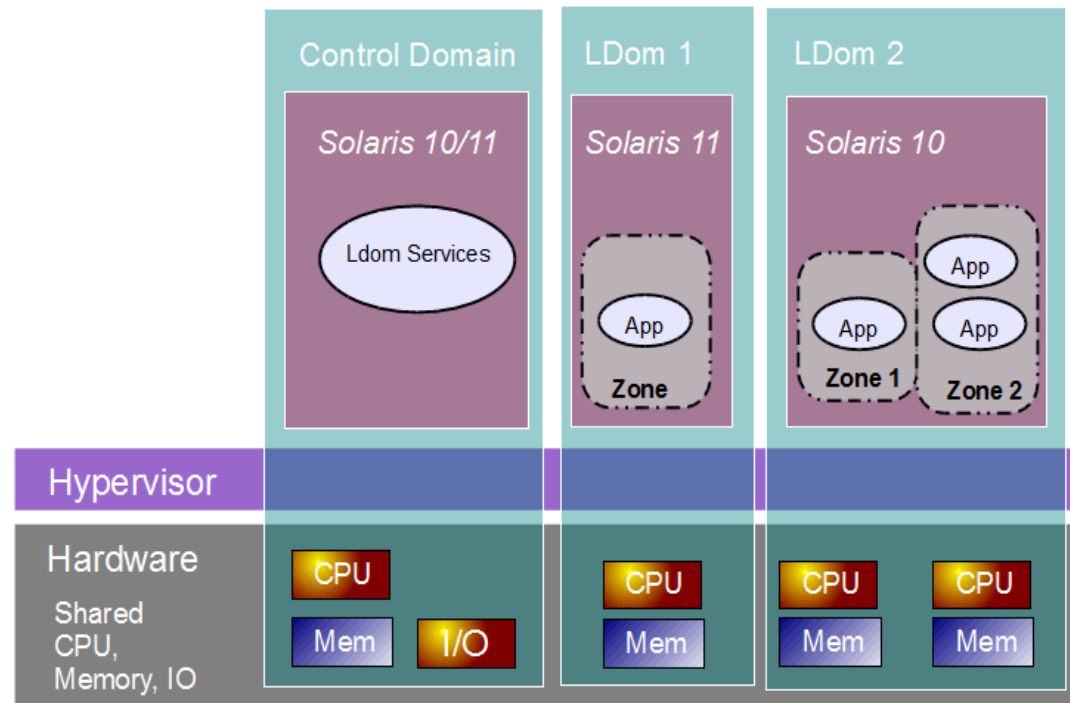
Firmware based Hypervisor

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



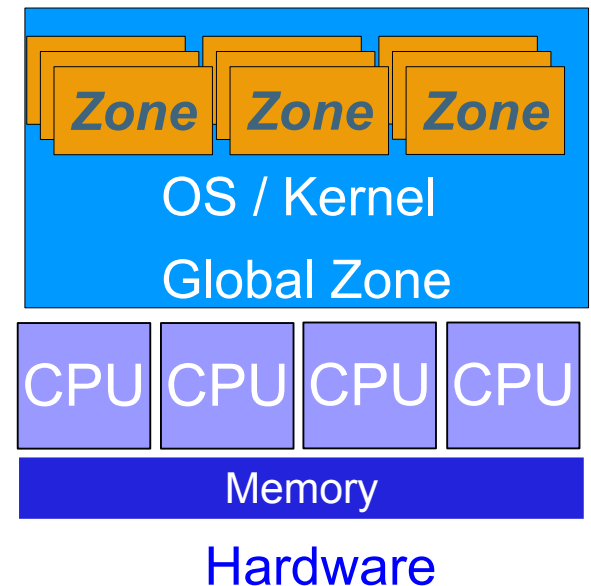
# Logical Domains (LDoms)

- „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)

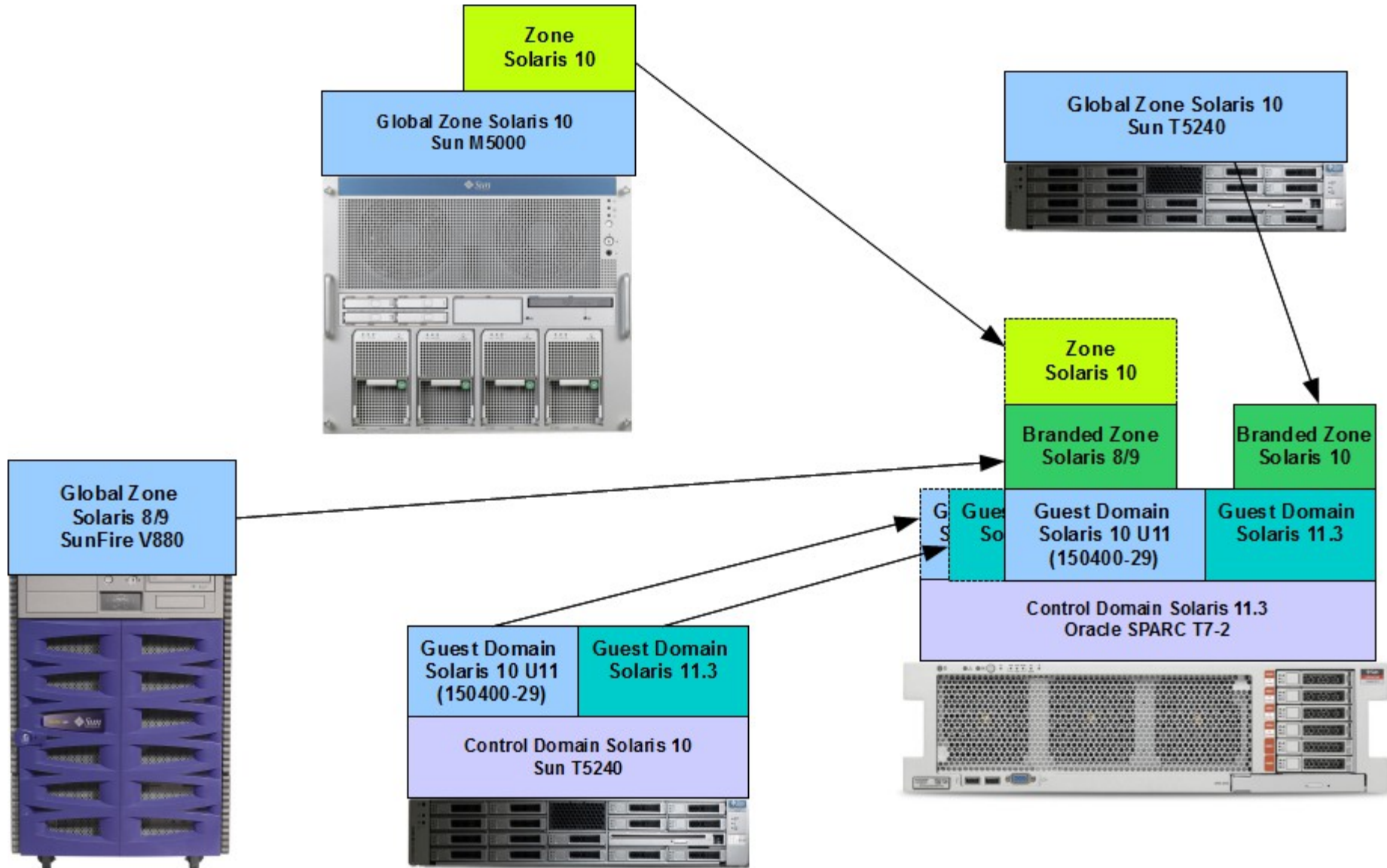


# Solaris Zones – Your virtual Environments

- 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 ...



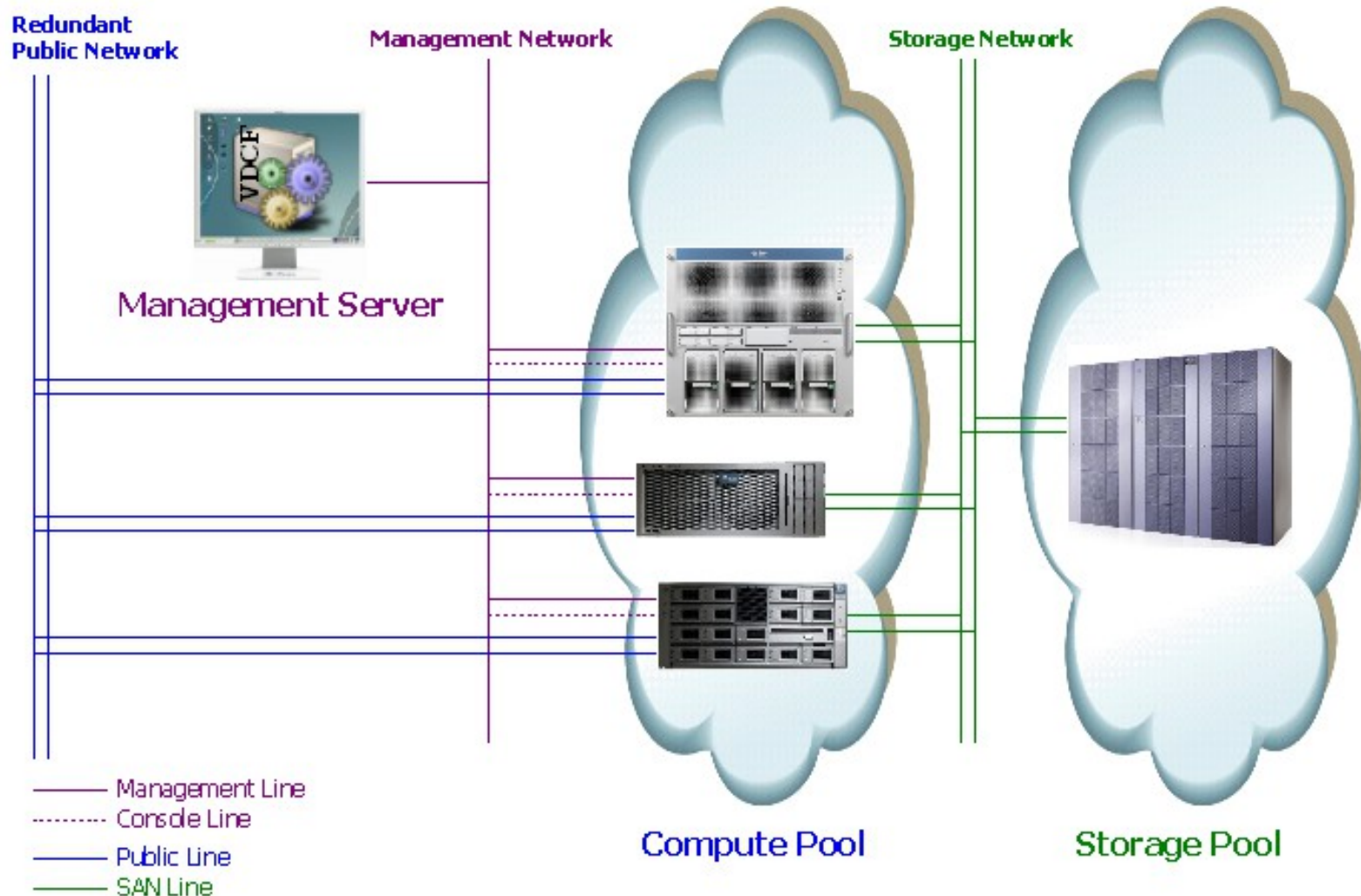
## VDCF – Virtual Datacenter Cloud Framework

- 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

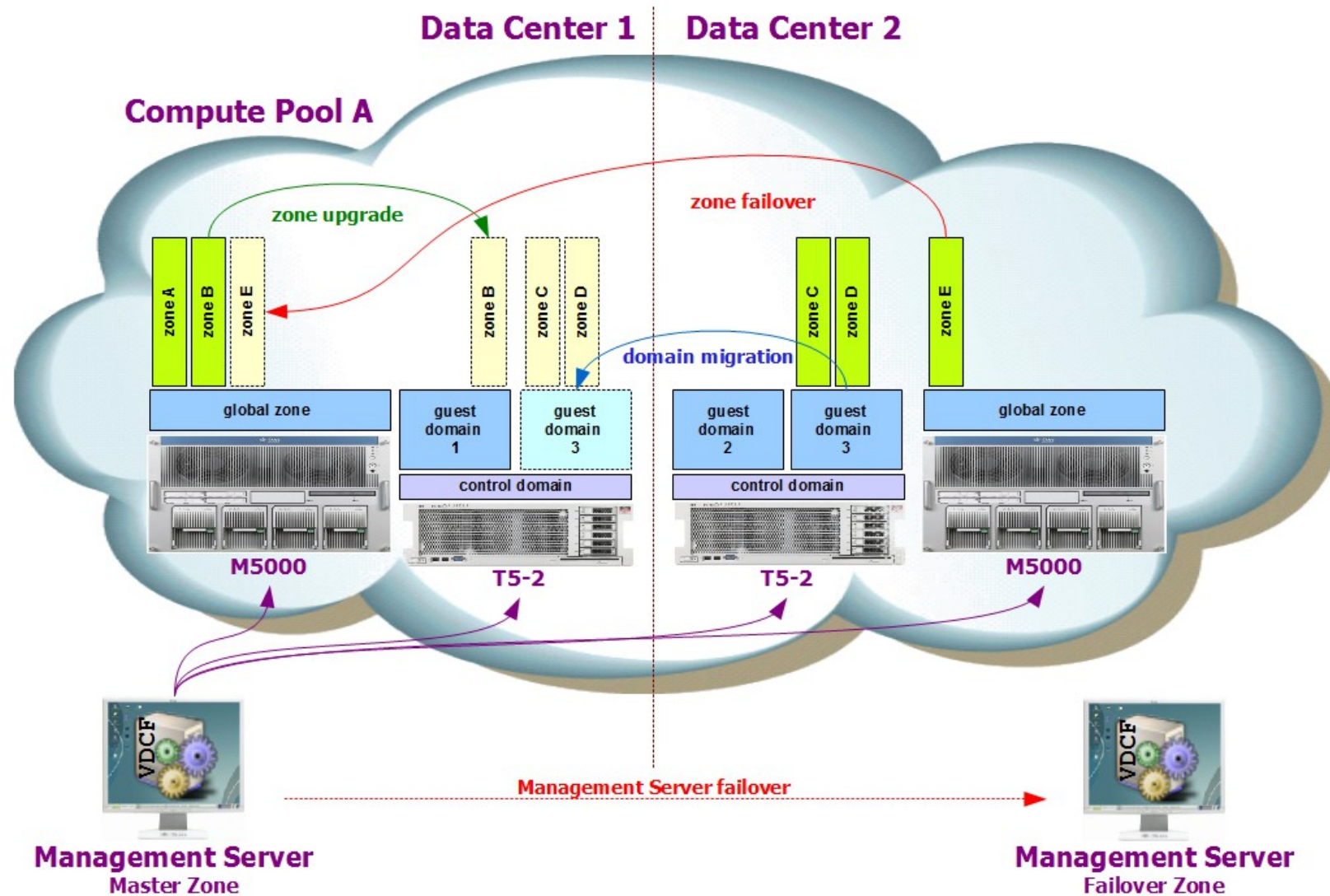
## VDCF - Goals

- **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

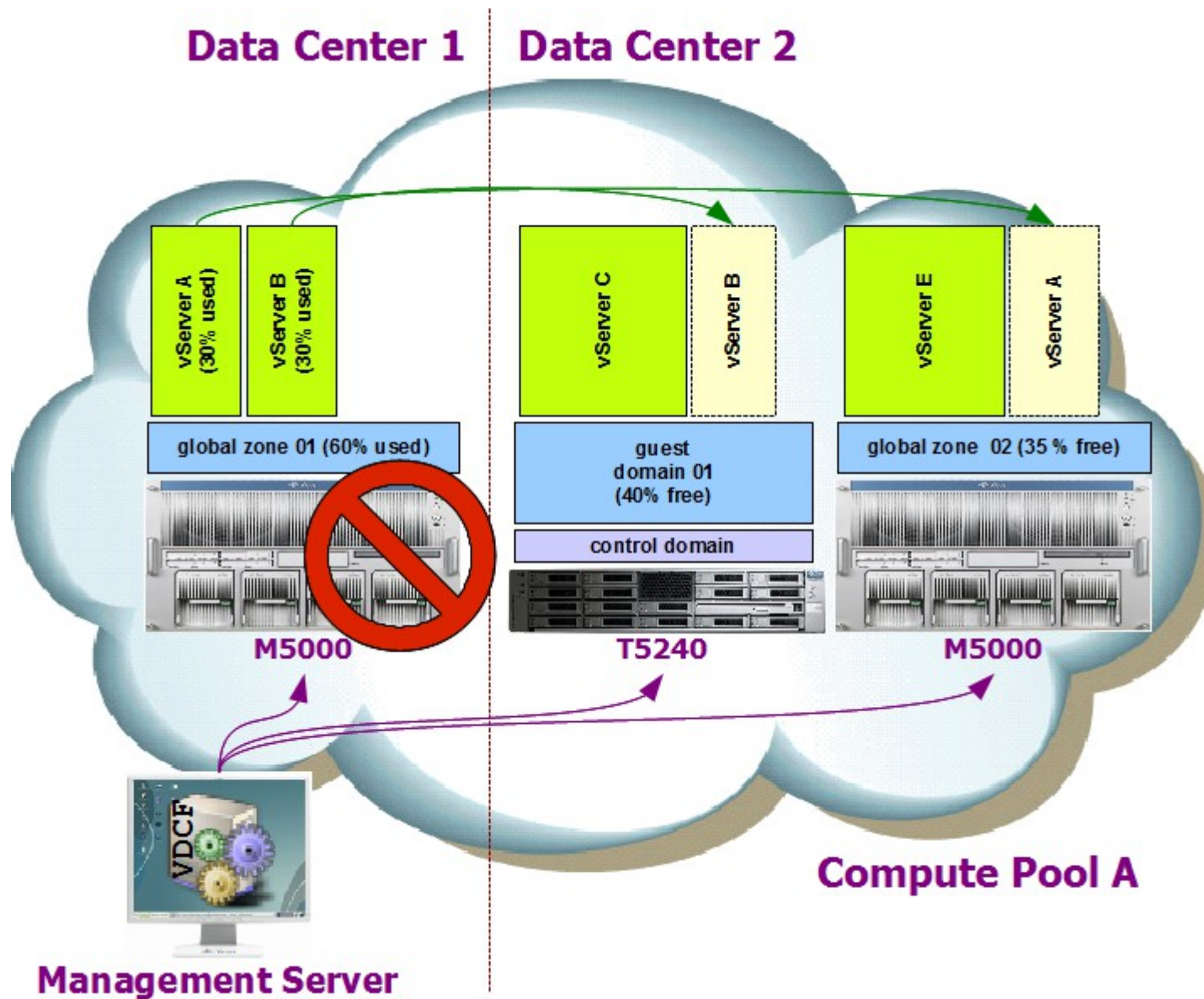
# Enterprise Private Cloud Architecture



# 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.

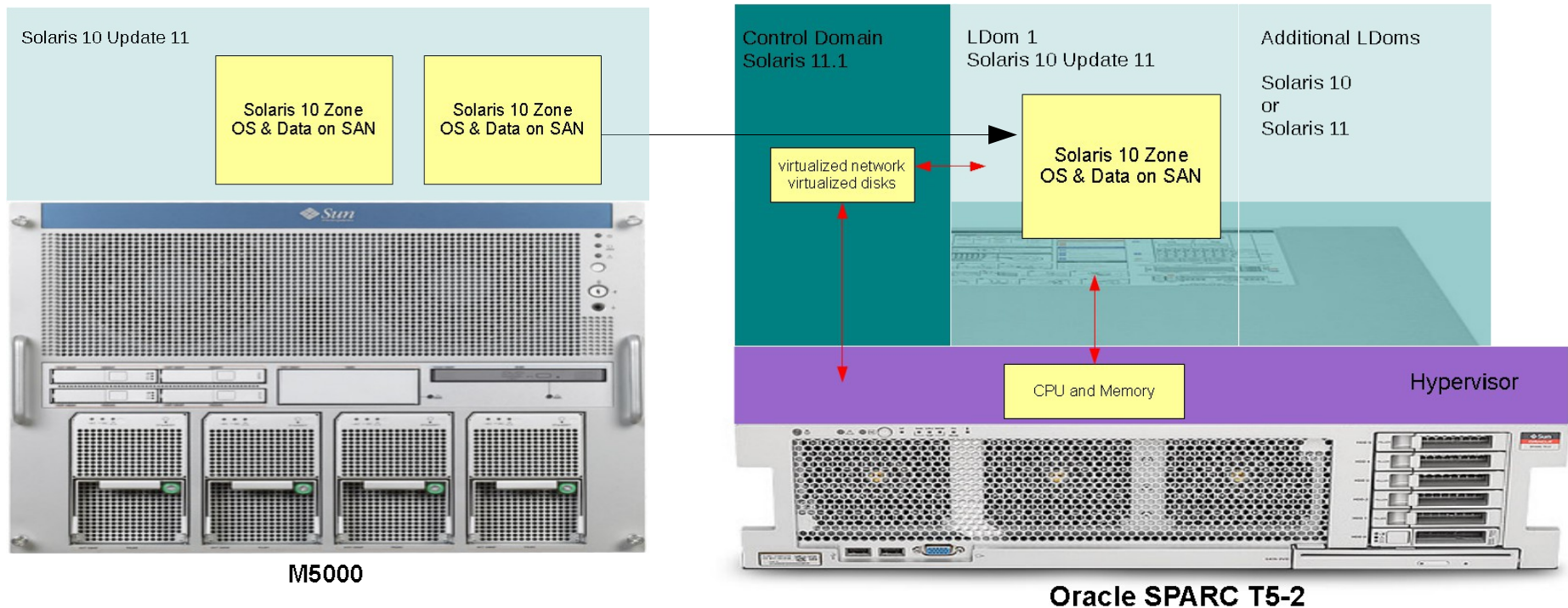
- **Availability / Recovery**

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

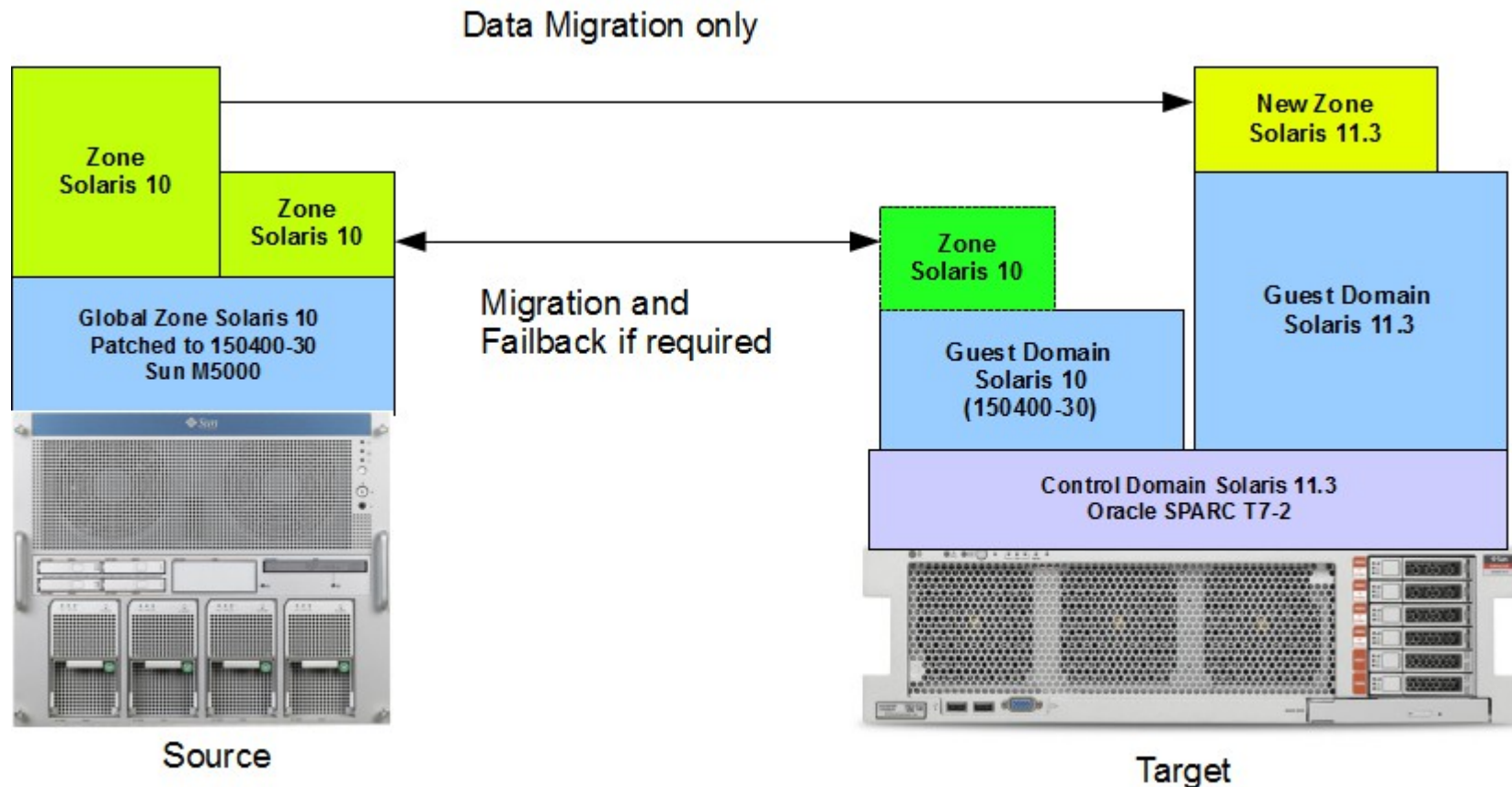


Full process is supported by VDCF  
 Install new hardware and setup of LDom virtualization  
 Migrate existing environments to the new hardware





# 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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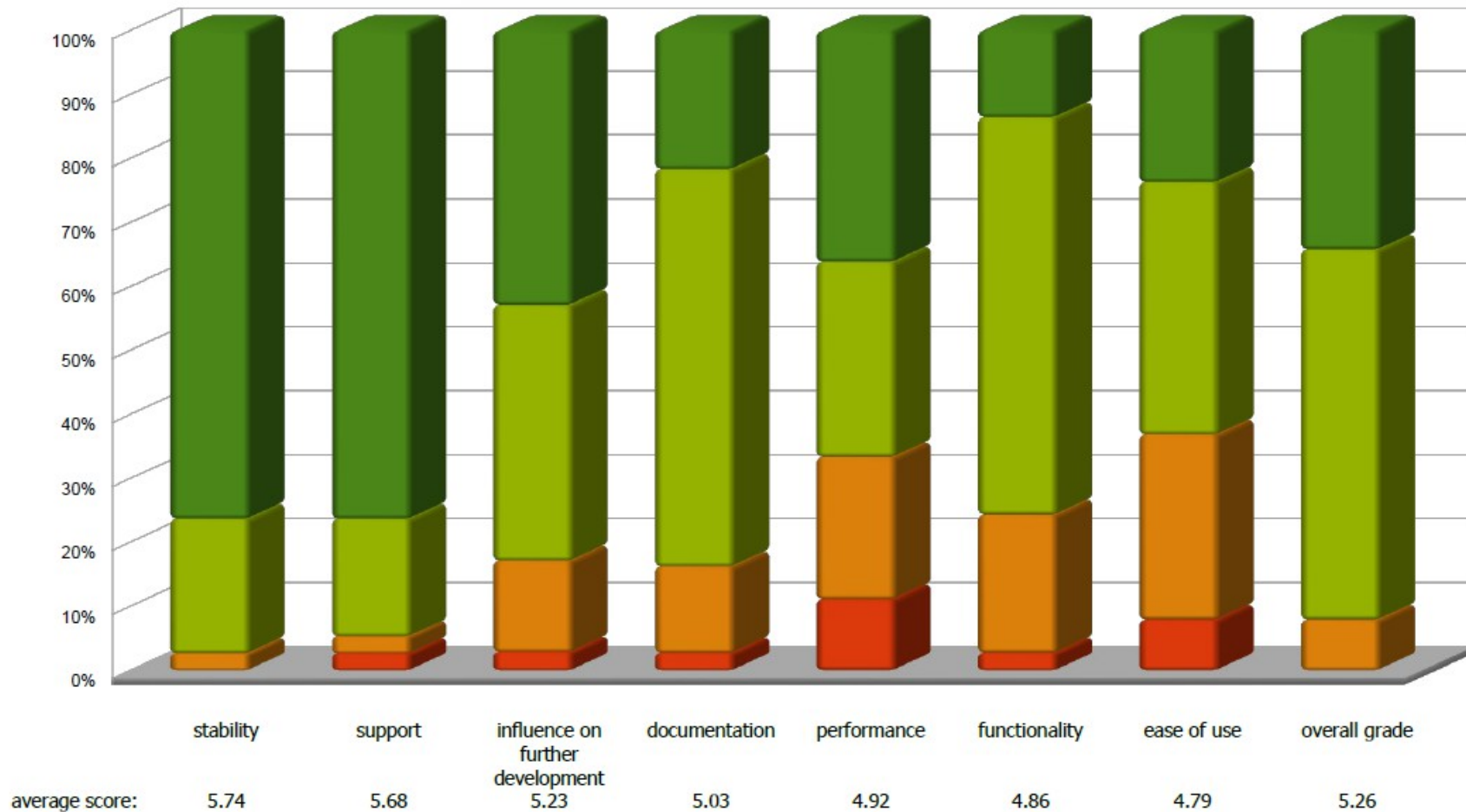


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# VDCF Customer Survey

Interpretation: 1 is worst, 6 is best

grade 1 grade 2 grade 3 grade 4 grade 5 grade 6



# JomaSoft Performance Compare



Execution Time

VDCF Single Thread Operations

Only 1 Core used!

