

What is Delivered with Solaris 11.4?

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Oracle ACE „Solaris“

Agenda

- About JomaSoft
- Solaris 10: History
- New Features introduced with Solaris 11
- Solaris 11.4 (available since 08/2018)

About JomaSoft

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



Specialized
Oracle Solaris 11



Specialized
SPARC T-Series Servers



Marcel Hofstetter

Working in IT since 25+ years
Solaris since 20 years
CEO at JomaSoft GmbH since 18 years

International Speaker:
Oracle OpenWorld, DOAG, UKOUG, SOUG, AOUG



Oracle ACE „Solaris“

SOUG (Swiss Oracle User Group) – Speaker of the Year 2016

Hobbies: Family, Travel, Wine & Dine, Movies

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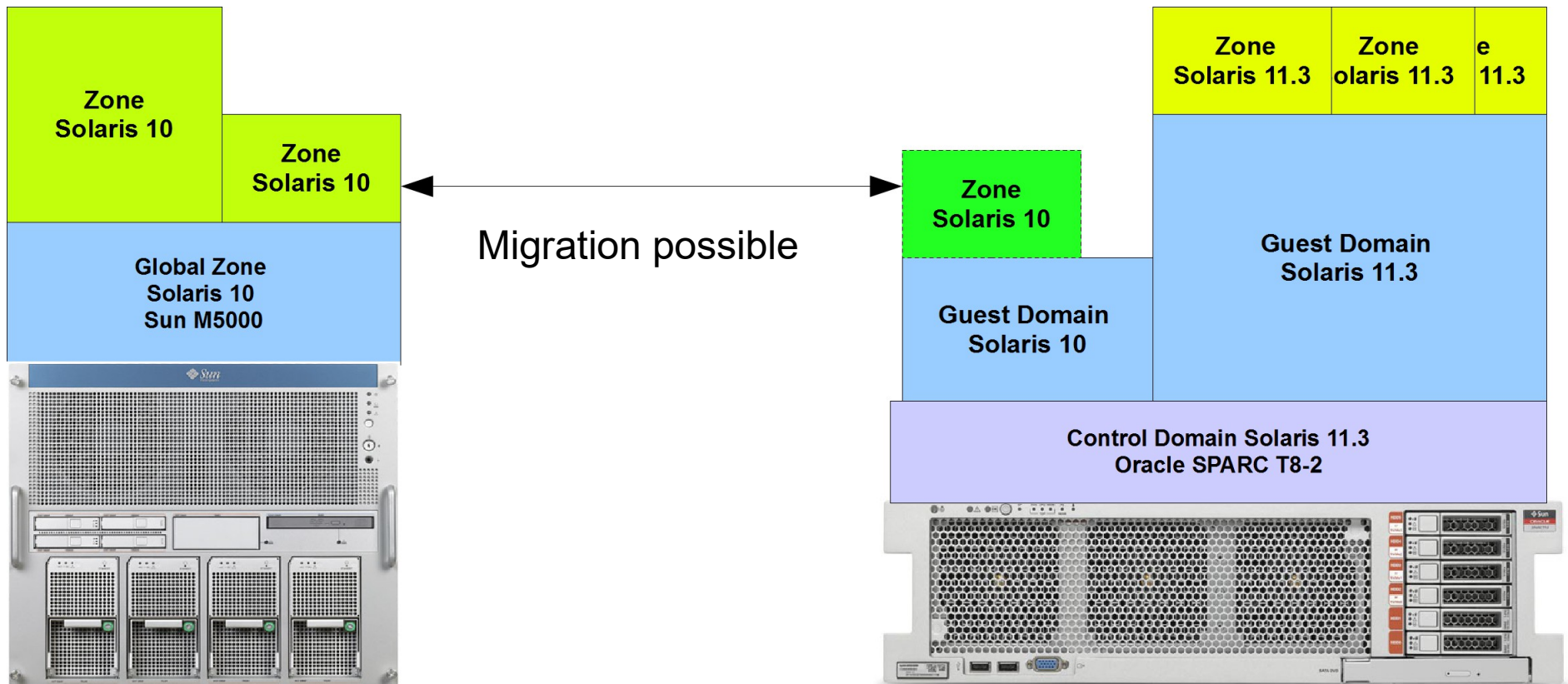
 https://twitter.com/marcel_jomasoft

 <https://jomasoftmarcel.blogspot.ch>

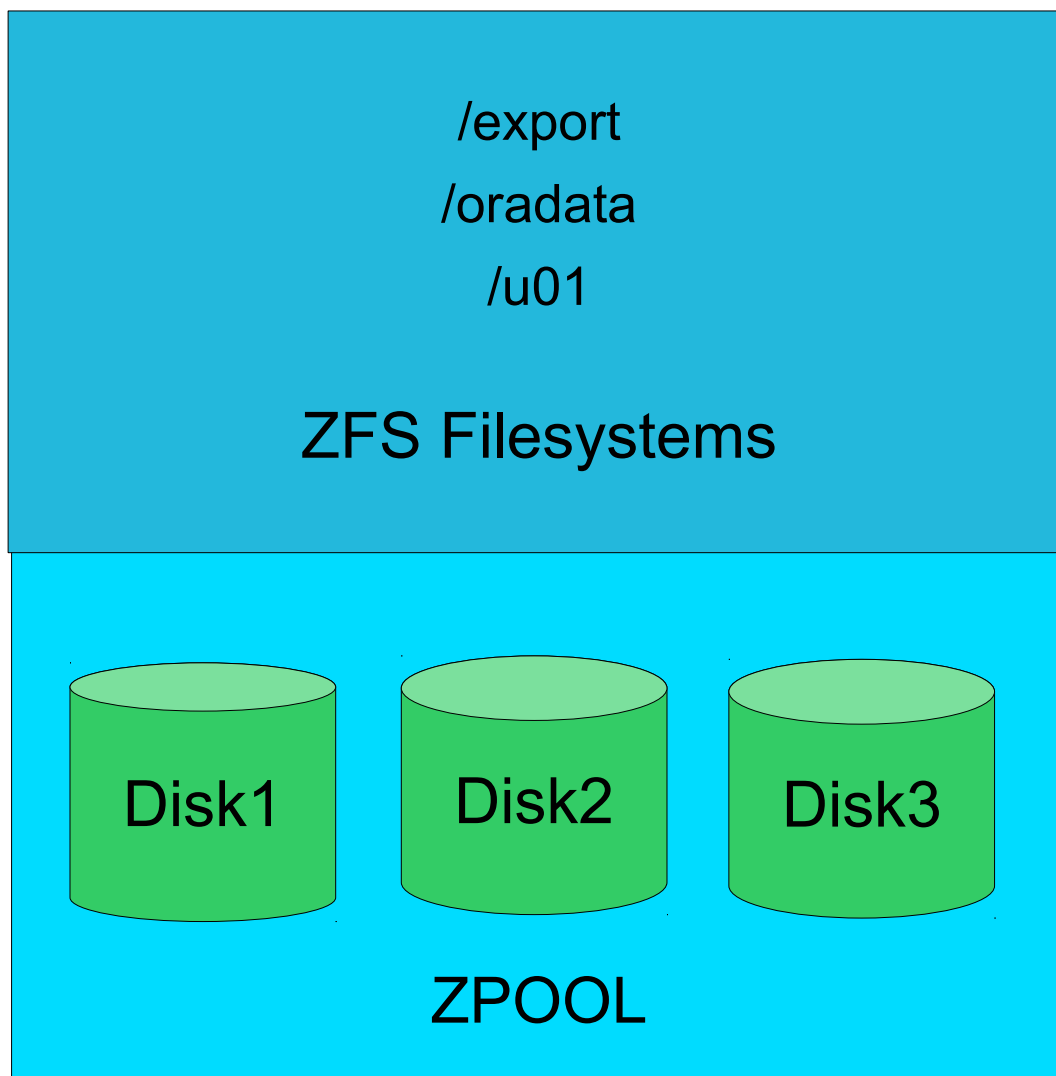
Solaris 10: History

- First Version available: 13 years ago → 2005
- New Features
 - Solaris Zones (Container)
 - ZFS (Filesystem)
 - Dtrace (Debugging)

Solaris Zones (Container)



Solaris ZFS



- Easy to use
 - Flexible
 - Filesystem size is optional
 - Snapshots & Clones
 - COW / No fscheck
-
- Stripe, Mirror, RAID
 - Add disks to grow
 - Export & Import

Solaris Dtrace

- (Lowlevel) System analysis in real time

```
# dtrace -n 'proc:::exec-success { trace(curpsinfo->pr_psargs); }'
```

```
dtrace: description 'proc:::exec-success ' matched 1 probe
```

CPU	ID	FUNCTION:NAME
1	18531	exec_common:exec-success /bin/mail -E
2	18531	exec_common:exec-success /usr/sbin/quota
3	18531	exec_common:exec-success -bash
5	18531	exec_common:exec-success /usr/lib/ssh/sshd -R
6	18531	exec_common:exec-success /bin/cat -s/etc/motd
3	18531	exec_common:exec-success zpool list

Solaris 10: Extended Support

- Premier Support expired on 31.01.2018
- Since 01.02.2018 in Extended Support
 - Must be ordered to gain access to new Patches
 - Cost: Additional 10%
 - Patches each Quarter
- Additional 20% 01.02.2019 – 31.01.2021
- Starting 01.02.2021
 - Support yes, but no new Patches
- It is about time to migrate to Solaris 11

Solaris 11

- Available for 7 years already: 11/2011
- Premium Support till 2031 / Extended till 2034
- What's new
 - Centralized Package Repository
(pkg install command installs all dependent Packages)
 - Root Filesystem must be ZFS
 - BootEnvironments make sure you can failback to previous setup after Patching/Upgrade
 - Patching is more efficient (s10: 3 Std → s11: 20 Min)
 - Dynamic network config (VNIC, excl IP-Stack for Zones)
 - Secure by default

Solaris 11.1 (2012)

- Security

Read-Only Environments (Zones)

Hacker and Applications can't make any changes on the system

→ Remote Logging

- LDom Secure Live Migration

Solaris 11.2 (2014)

- Kernel Zones

Kernel Zones are independent of each other with own Kernel.
Update individually

- Unified Archives

Very efficient Installation of predefined Environments/Images
(Bare Metal Recovery in 15 Minutes)

- Live Zone Reconfiguration (LZR)

Change CPU, FS, Network, Disks without reboot

Solaris 11.3 (2015)

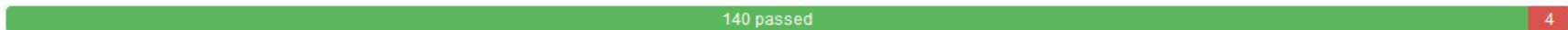
- Security Compliance
Security HTML-Reports (PCI-DSS, ...)
- CVE Metadata (Vulnerabilities)
Is Fix installed ?

Solaris 11.3 – Compliance tool

Compliance and Scoring

The target system did not satisfy the conditions of 4 rules! Please review rule results and consider applying remediation.

Rule results



Severity of failed rules



Score

Scoring system	Score	Maximum	Percent
um:xccdf:scoring:default	77.938248	100.000000	77.94%

Rule Overview

- pass
- fail
- notchecked
- fixed
- error
- notselected
- informational
- unknown
- notapplicable

Search through XCCDF rules

Group rules by:

Title	Severity	Result
▼ Oracle Solaris Security Policy 4x fail		
▼ Verify the OS configuration 1x fail		
Package integrity is verified	high	pass
The OS version is current	medium	fail
Package signature checking is globally activated	medium	pass
▼ Verify file system information. 1x fail		

Solaris 11.3 – Compliance tool

The OS version is current

Rule ID	OSC-53005
Result	fail
Time	2017-09-11T16:35:16
Severity	medium
Identifiers and References	
Description	Systems should be kept up to date to ensure that the latest security and operational updates are installed. You can run 'pkg repositories.

SCE stdout

```
The system is not up to date
The system is currently at 0.5.11-0.175.3.21.0.5.0
and the latest available is 0.5.11-0.175.3.23.0.5.0
```

Remediation description:

The system is not up to date. Update the system.

Remediation script:

```
# pkg update
```

VDCF Dashboard – Compliance



VDCF Dashboard

[home](#)
[logout](#)

Compliance Report

 Show entries

Server	Type	Benchmark	Score	Timestamp	# Passed	# Failed	# Error	# High	# Me
v0123	vServer	default	77.938248	2017-09-11T16.35.39	140	4	0	0	4
v0143	vServer	default	77.938248	2017-09-11T16.37.19	140	4	0	0	4
s0024	Node	cdom	87.619041	2017-09-11T16.02.22	140	3	0	1	2
g0062	Node	baseline	89.855064	2017-09-11T16.33.55	134	6	0	1	5
s0003	Node	cdom	95.238091	2017-09-11T14.58.15	142	1	0	1	0

Showing 1 to 5 of 5 entries

Solaris 11.4

- Available since 08/2018
- What's new
 - Solaris (Web) Dashboard
 - Admin History
 - ZFS: Asynchronous Destroy
 - ZFS: Compressed & Resumable Replication
 - ZFS: ZPOOL Disk Remove
 - Zonen: Flexible Boot using SMF
 - Zonen: Online ZPOOL Dataset add/remove

Solaris 11.4 / Solaris (Web) Dashboard

- Solaris Dashboard contains the Overview
- Solaris Analytics for Analysis
- Statistics and Events for easier diagnose
- Statistics store (sstore / DB / CLI)
- RAM, CPU, Disk, Network, SMF, ...
- Realtime and historical data
- Various Views (Components, Partitions, Time frames)

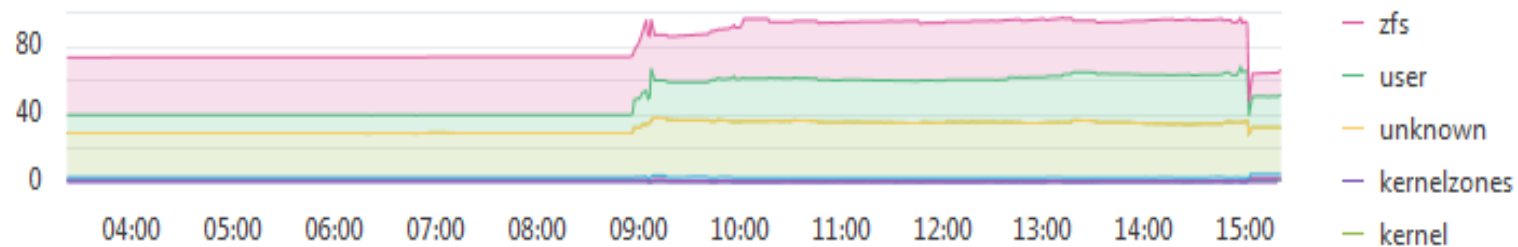
Solaris 11.4 / Solaris (Web) Dashboard

RAM Usage

Physical memory usage. RAM utilization is partitioned by different uses; the user processes with the highest resident set sizes are shown.

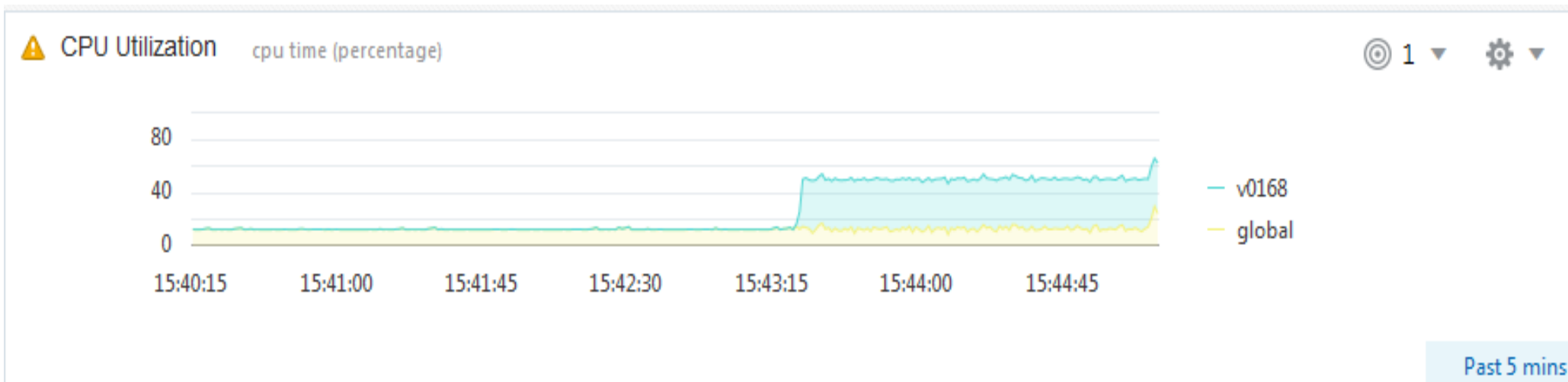
Memory Usage

Physical memory usage (percentage)

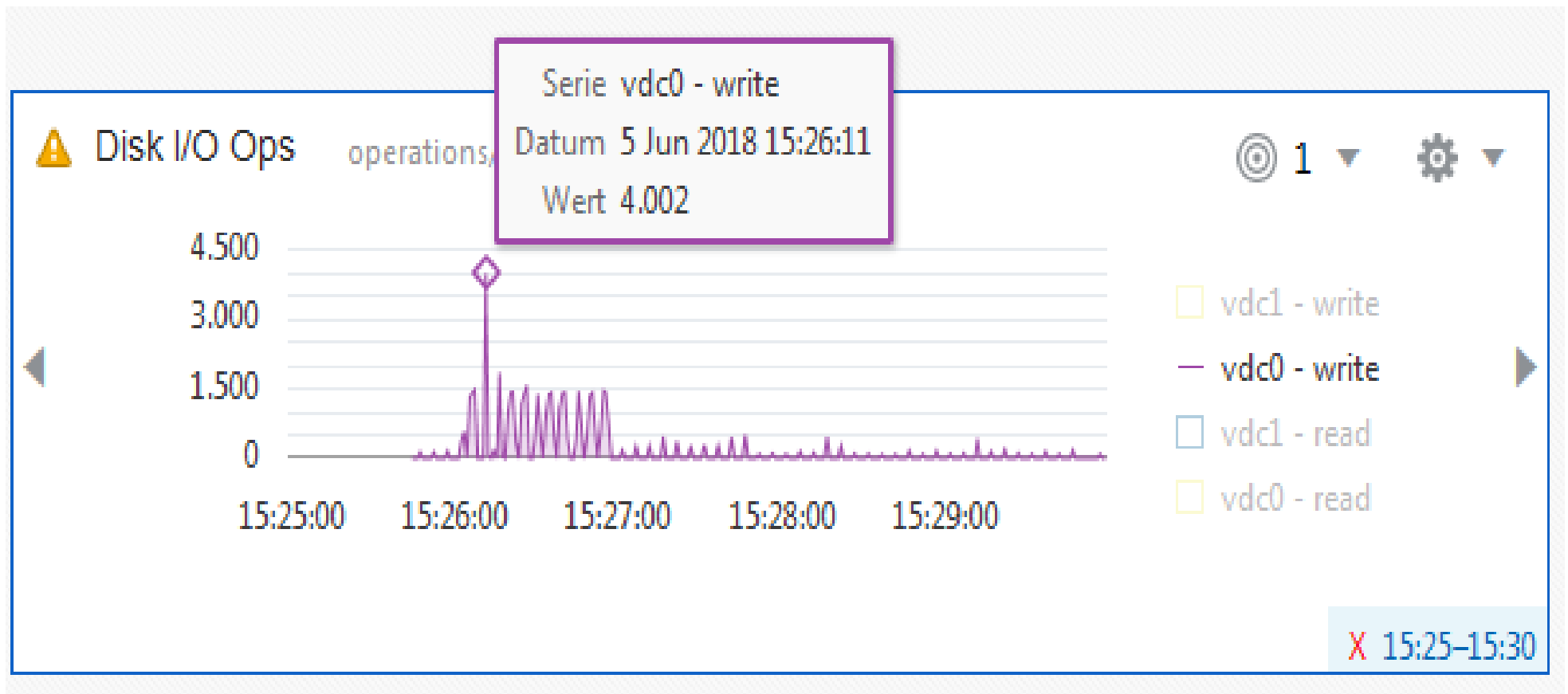


Past 12 hrs

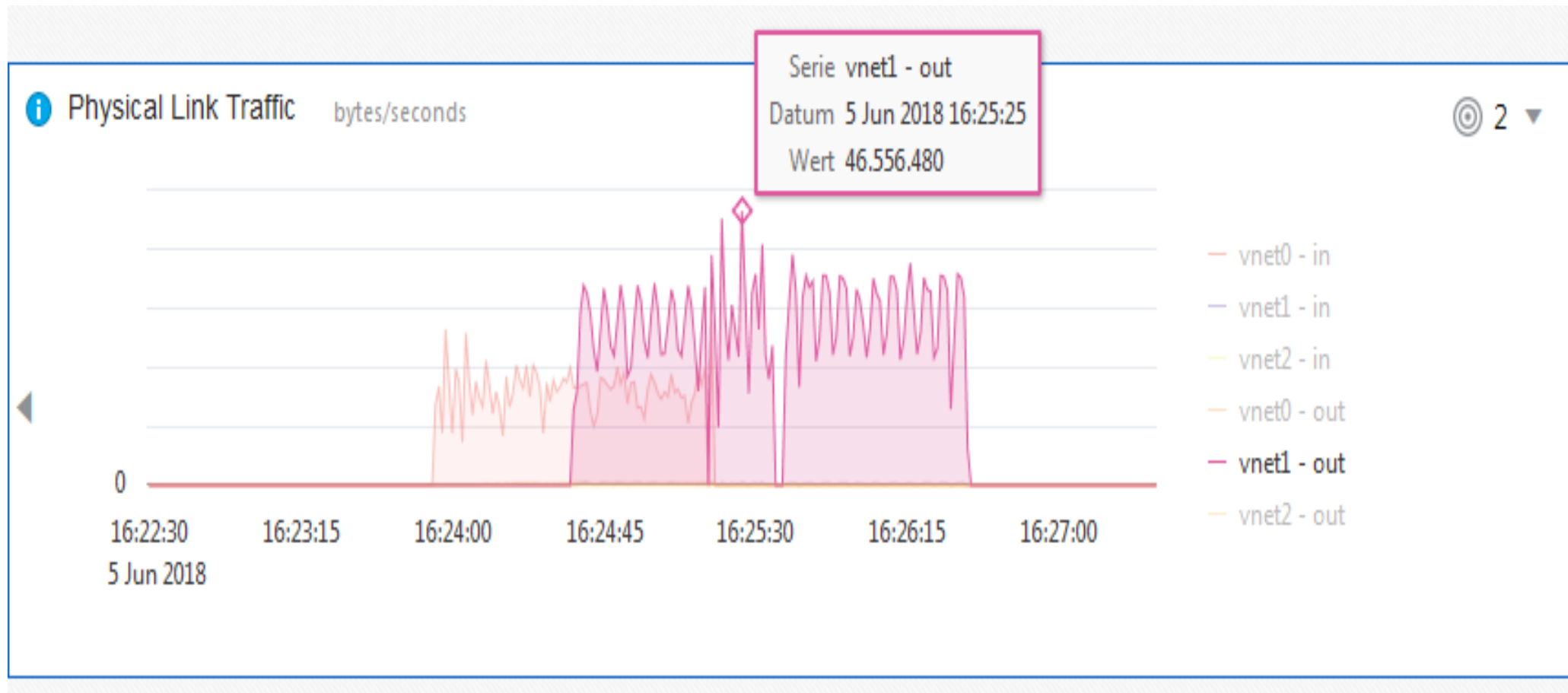
Solaris 11.4 / Solaris (Web) Dashboard



Solaris 11.4 / Solaris (Web) Dashboard



Solaris 11.4 / Solaris (Web) Dashboard



Solaris 11.4 / Admin History

What did Marcel on 5th June evening?

```
# admhist -a 20180605175000 -b 20180605181000 -v | grep marcel
```

```
2018-06-05 17:59:38.419+02:00 marcel@g0068 cwd=/export/home/marcel  
/usr/sbin/zpool zpool destroy g0068_delegated
```

```
2018-06-05 17:59:52.262+02:00 marcel@g0068 cwd=/export/home/marcel  
/usr/sbin/zpool zpool create v0168_delegated c1d2
```

```
2018-06-05 18:00:45.894+02:00 marcel@g0068 cwd=/root  
/usr/sbin/zpool zpool import v0168_delegated
```

Solaris 11.4 / ZFS (destroy)

```
# zfs list destroytest/fs1
```

NAME	USED	AVAIL	REFER	MOUNTPOINT
destroytest/fs1	22.1G	17.1G	22.1G	/fs1

```
# time zfs destroy destroytest/fs1; zfs create -o mountpoint=/fs1 destroytest/fs1
```

```
real 0m0.654s
```

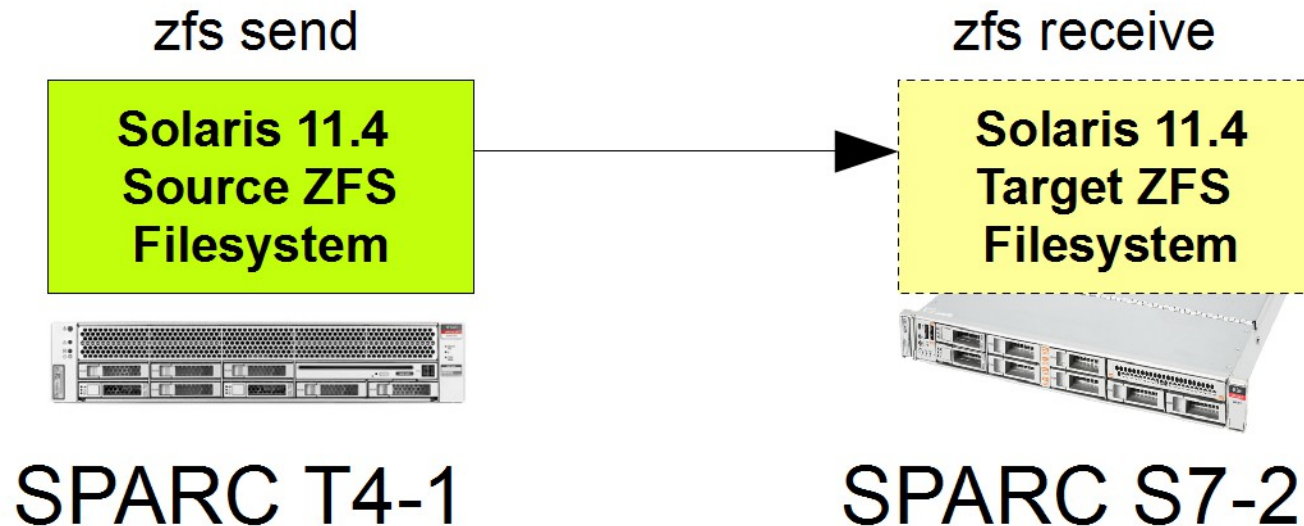
```
user 0m0.005s
```

```
sys 0m0.621s
```

```
# zpool monitor -t destroy destroytest 5
```

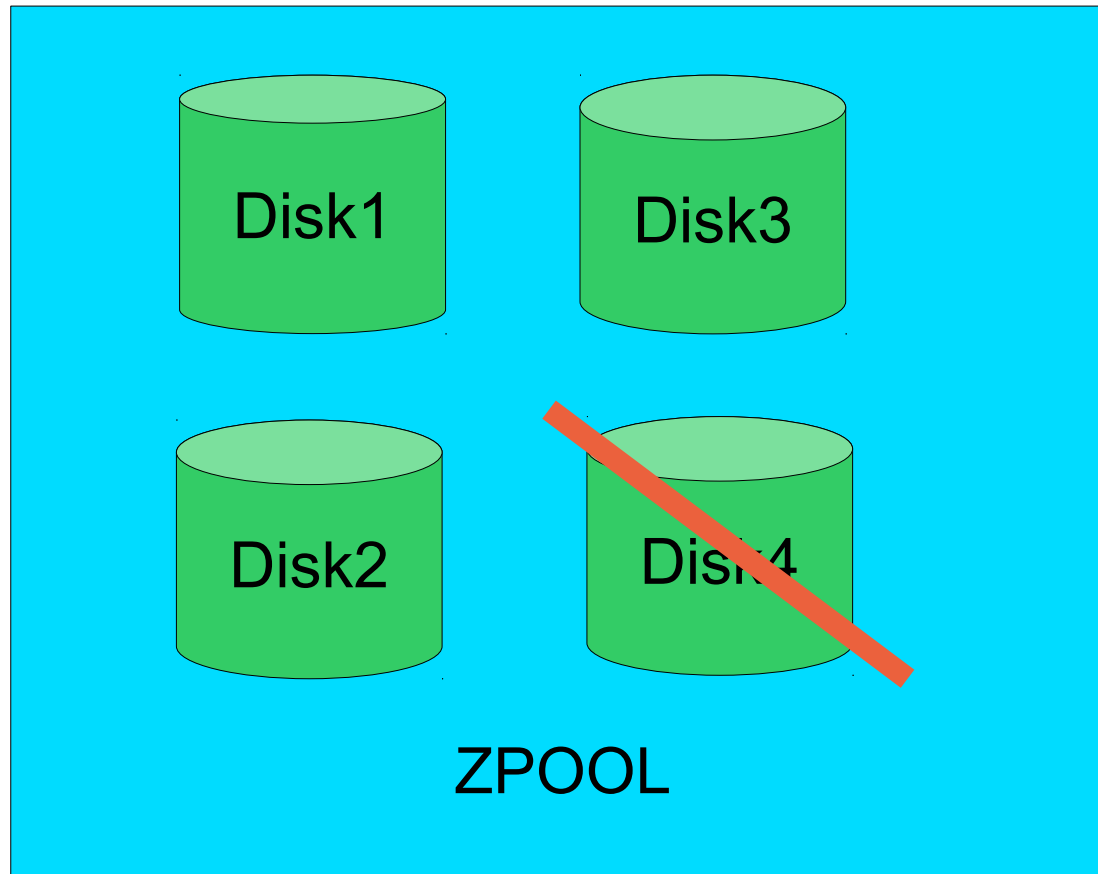
POOL	PROVIDER	TOTAL	SPEED	TIMELEFT
destroytest	destroy	22.1G	0	unknown
destroytest	destroy	20.1G	401M	51s
destroytest	destroy	13.5G	872M	15s
destroytest	destroy	10.8G	767M	14s
destroytest	destroy	4.92G	878M	5s

Solaris 11.4 / ZFS (Replication)



- Filesystem Replication over the network
- Restart is now supported
- Compressed data is now transferred compressed

Solaris 11.4 / ZFS (Disk Remove)



- ZPOOLS can shrink now (finally)
- Data is distributed to the other disks

Solaris 11.4 / Zones (SMF)

```
-bash-4.4$ svcs | grep zones/zone  
online          8:41:22 svc:/system/zones/zone:v0157  
online          8:41:31 svc:/system/zones/zone:v0134
```

- Each Zone has his own SMF Service
- Dependencies for booting can be defined now

Solaris 11.4 / Zones (Dataset Add/Remove)

```
# zonecfg -z v0168 -r "add dataset; set name=v0168_delegated; end"
zone 'v0168': Checking: Adding dataset name=v0168_delegated
zone 'v0168': Applying the changes
# zlogin v0168
[Connected to zone 'v0168' pts/7]
Oracle Corporation      SunOS 5.11
Solaris_11/11.4/ON/production.build-59:2018-03-22      March 2018
root@v0168:~# zpool import v0168_delegated
root@v0168:~# zpool list
```

NAME	SIZE	ALLOC	FREE	CAP	DEDUP	HEALTH	ALTROOT
rpool	9.94G	764M	9.19G	7%	1.00x	ONLINE	-
v0168_delegated	9.94G	98.5K	9.94G	0%	1.00x	ONLINE	-

- Delegate ZPOOLS online into Zones

Solaris 11.4 / Small things

- Firewall: Packet Filter (PF) replaces IP Filter (IPF)
- Apache 2.4 replaces Apache 2.2
- `fsstat -l`, measures Filesystem I/O Latency
- NFS Server Version 4.1
- Names for Network Routes
- Open Source Software
 - Puppet, Go
 - Oracle Instant Client 12.2 / 18.3
 - OpenStack removed

Solaris 11.4 / Known challenges

- Failback from S11.4 to S11.3 with Zones

S11.4 Zone BootEnvs are not recognised by S11.3 and not deleted.

Must be done manually

- SunLDAP → OpenLDAP

ldapsearch/ldapmodify API changes

<http://notallmicrosoft.blogspot.com/2018/04/solaris-114-ldap-changes-for-ldapsearch.html>

- SunSSH → OpenSSH

```
-bash-4.4$ ssh -V
```

```
Sun_SSH_2.4, SSH protocols 1.5/2.0, OpenSSL 0x100020cf
```

```
-bash-4.4$ ssh -V
```

```
OpenSSH_7.5p1, OpenSSL 1.0.2p 14 Aug 2018
```

https://docs.oracle.com/cd/E37838_01/html/E61025/openssh1.html#OSMSSssh-transition

Solaris 11.4 / Old Hardware

- Not supported:

SPARC Enterprise M3/4/5/8/9000

Sun Fire T1/2000

Sun SPARC Enterprise T5xx0/T6xx0

Sun Fire X2x00/X4xx0

Sun Blade X6xx0 / X8xx0

Still supported with Solaris 11.3 (MOS Doc 2382427.1)

Solaris 11.3 / Enterprise Health Check

- Available since S11.3 SRU35 (August 2018)
- Verify installed software for Compatibility with Solaris 11.4 and produces HTML Report

```
# pkg install update-check
```

```
# compliance assess -b ehc-update
```

```
# compliance report
```

```
/var/share/compliance/assessments/ehc-update.Standard.2018-09-14,10:43/report.html
```


Solaris 11.3 / Enterprise Health Check

▼ Oracle Enterprise Health Check (EHC) tests to validate that system can update to Oracle Solaris 11.4 2x fail		
▶ Oracle Solaris 11.4 hardware support		
▼ Unsupported Driver 1x fail		
Unsupported legacy drivers	high	fail
Unsupported QLogic 1GB/2GB adapter	high	pass
Unsupported Areca RAID controller	high	pass
▶ Unsupported IPS packages		
▶ Network configuration		
▶ NFS configuration		
▶ Reliability, Availability, Serviceability (RAS)		
▼ Oracle Solaris infrastructure services 1x fail		
Oracle Solaris IPfilter service	high	fail
SMB print service	high	pass
Sun DHCP server	high	pass
Apache 2.2 (or older)	high	pass
Apache Tomcat 6 (or older)	high	pass
MySQL 5.1 (or older)	high	pass
Sun SSH server	high	pass

Solaris 11.3 / SRU

- Till August 2018 one SRU per month
- Now for minimum of one year – one update each 3 months
- Security updates only
- Update are based on SRU35 (Delta)
- **Delivery: My Oracle Support Download**
Oracle Solaris 11.3 Limited Support Updates (LSU) Index
(Doc ID 2433413.1)
- Helps if you still run very old Hardware
- Time to plan upgrade to Solaris 11.4

Summary - Why Solaris (11)?

- Stable, longterm Enterprise OS (2034)
- Secure and stable Containers (Zones) since 2005
- Security Compliance integrated
- Performance/Issues identified with the Solaris Dashboard
- Oracle Licensing: Only for the CPUs you need
- JomaSoft: 18 years Experience incl. Product VDCF
- Migrate now!

What is Delivered with Solaris 11.4?

Questions?

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