// SYSTEMVERWALTUNG MIT UYUNI

OPEN SOURCE AUTOMATION DAYS 2020

WHOAMI

- Christian Stankowic
- Senior System Engineer bei SVA
- Linux, Virtualization, DevOps, Infrastructure as Code

/ Produktportfolio auf einen Blick

Datacenter-Infrastructure

- Storage- & Server-Systeme
- IP-Netzwerk-Infrastruktur
- Software Defined Data Center / Container
- Cloud & Automation
- Hyperconverged

Mainframe

- Services / Consulting
- zHosting
- zBusiness Services
- IBM System z Hardware
- Managed Services

End User Computing

- Application & Desktop (CAD/E) Virtualization
- Virtual Workspace & Mobility
- Application, Information & Device Management
- Unified Endpoint Management

Big Data Analytics & IoT

- Data Science & AI
- Operational & Security Analytics
- Business Intelligence
- Internet of Things
- Data Engineering & Microservices

SAP

- SAP Technologie
- SAP Solution Manager
- SAP Analytics
- SAP Security
- SAP Lizenzmanagement

Business Continuity

- Archivierung
- Backup und Recovery
- Disaster Recovery
- High Availability
- Notfallplanung

Service Management

- Software Asset Management
- Enterprise Asset Management
- IT Service Management
- Enterprise Service Management

IT Security

- Information Security & Compliance Consulting
- IT-Security-Architektur & -Integration
- Penetration Testing
- IT-Security Managed Services
- Security Incident Response

Agile IT & Software Development

- DevOps & Agile Kultur
- Software-Entwicklung
- Infrastructure as Code & Configurations Management
- CICD Pipeline/Toolchain
- Container-Plattformen & Cloud Management

AGENDA

1. Was ist Uyuni?
2. Features
3. Salt
4. Monitoring
5. Ausblick

> **Salar de Uyuni**, Bolivien
> Größter Salzsee der Erde
> 10.000+ Jahre alt

Quelle: [Wikipedia]

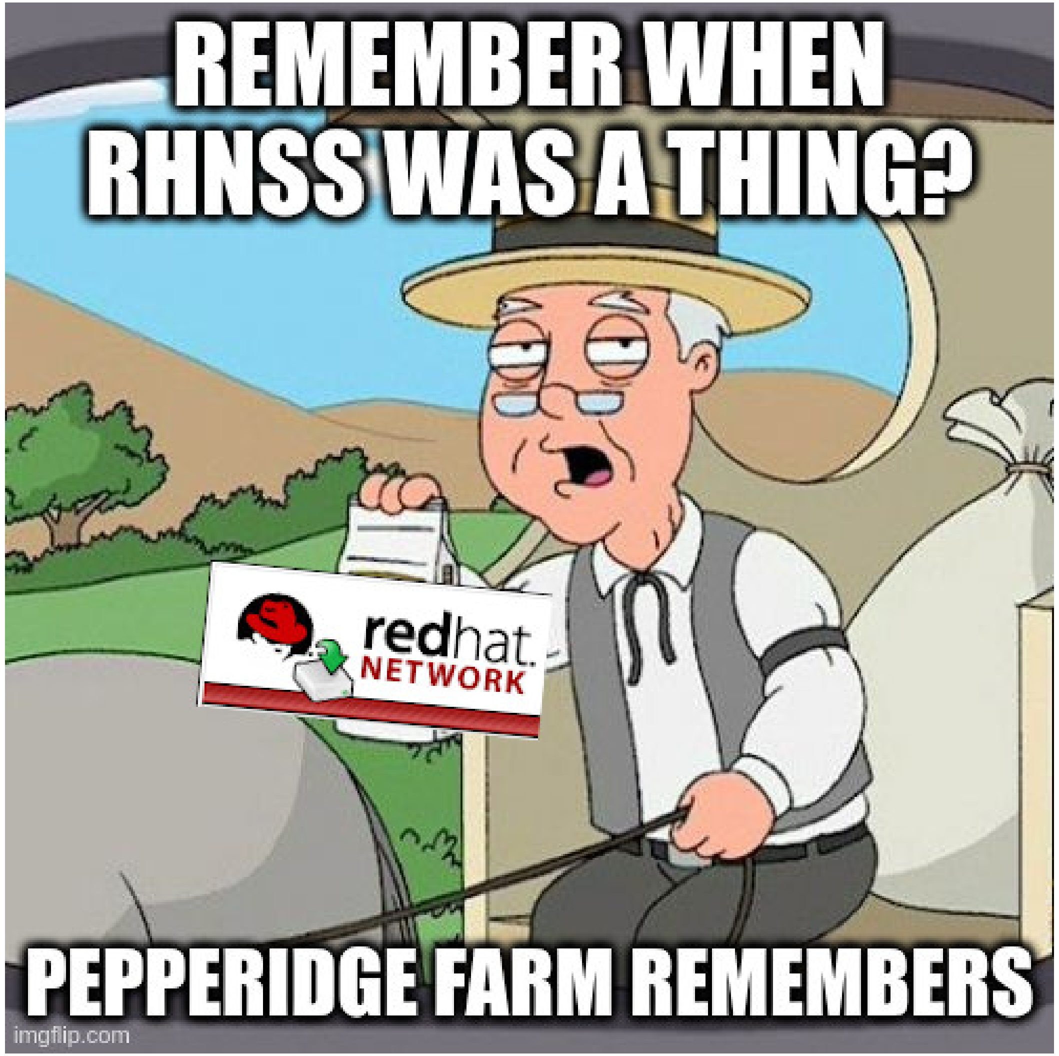
UYUNI

> Open Source-Software für Systemverwaltung

> **/uju:ni/**

> https://uyuni-project.org

AUF DEN SPUREN VON SPACEWALK



AUF DEN SPUREN VON SPACEWALK

> Uyuni ist ein Fork von **Spacewalk**

> Spacewalk war seit 2008 die Basis von **Red Hat Satellite**
>> SUSE Manager basiert seit 2010 auch auf Spacewalk

> Seit 2014 basiert Satellite 6 auf Foreman und Katello, Spacewalk wurde **vernachlässigt**

> Code-Beiträge wurden nur langsam bewertet

> SUSE hat jahrelang Spacewalk modernisiert
>> neue GUI, modernes Configuration Management

> 2018 wurde Spacewalk geforkt und die Community gegründet

UYUNI VS. SPACEWALK

- sehr aktive Entwicklung als **Rolling Release**
  - monatliche Versionen
- Code-Basis für **SUSE Manager 4.x**
  - Minor-Versionen alle ~12 Monate
- Radikale **Modernisierung**
  - React Web-Oberfläche
  - Python 3 und JDK11-Codebase
  - bessere Usability und Skalierung
  - Container-/**Kubernetes**-Unterstützung

UYUNI VS. FOREMAN

- deutlich **schlankere** Architektur
- geringere Hardware-Anforderungen
- übersichtlichere Web-Oberfläche
- schnellere **Einarbeitung**
  - **grafisches** Configuration Management
- ausreichend für die meisten Anforderungen

Uyuni > Home > Overview

0 systems selected | admin | SVA

Search page

- Home
  - Overview
  - Notification Messages
  - User Account
  - My Preferences
  - My Organization
- Systems
- Clusters
- Salt
- Images
- Patches
- Software
- Content Lifecycle
- Audit
- Configuration
- Schedule
- Users

Copyright Notice

Uyuni release 2020.06

Most Critical Systems

System	All Updates	Security Patches	Bugfix Patches	Enhancement Patches
hypervisor	86	39	47	0
Uyuni-Client	86	37	49	0

1 - 2 of 2 most critical systems displayed

View All Critical Systems

Recently Scheduled Actions

No recently scheduled actions.

You have scheduled no actions within the past thirty days. You may view a list of past completed actions at **Schedule > Completed Actions** and a list of past failed actions at **Schedule > Failed Actions**.

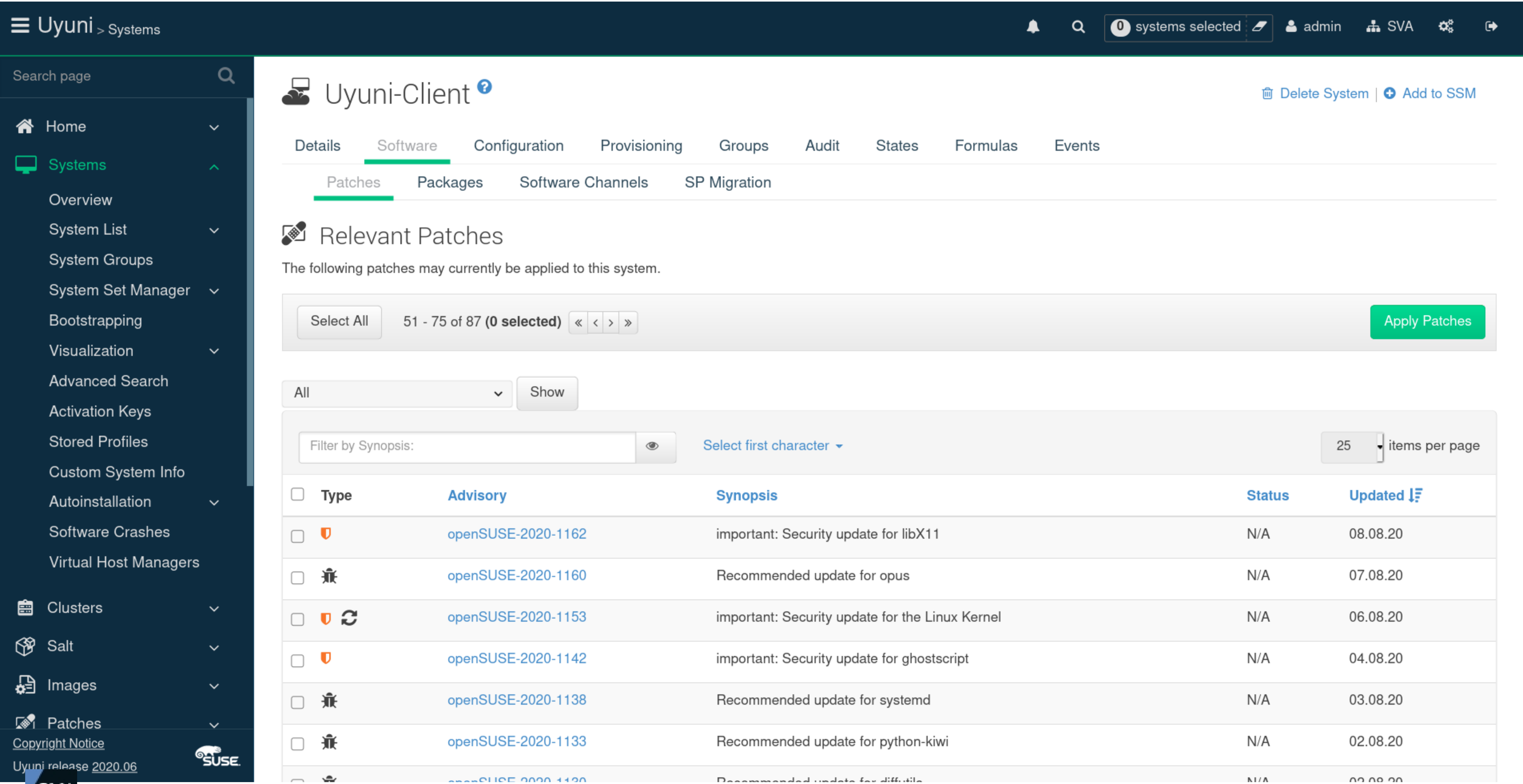
Relevant Security Patches		Systems	Updated
openSUSE-2020-1579	moderate: Security update for cifs-utils	2	30.09.20
openSUSE-2020-1568	important: Security update for libqt5-qtbase	1	28.09.20
openSUSE-2020-1535	moderate: Security update for ovmf	1	26.09.20
openSUSE-2020-1534	moderate: Security update for openldap2	2	26.09.20
openSUSE-2020-1517	moderate: Security update for jasper	2	24.09.20
openSUSE-2020-1513	important: Security update for samba	2	24.09.20
openSUSE-2020-1430	moderate: Security update for libxml2	2	15.09.20
openSUSE-2020-1416	moderate: Security update for openldap2	2	12.09.20

FEATURES

- Bereitstellen und Verwalten **verschiedener** Workloads
  - Bare-Metal
  - On-premise VMs (*XEN/KVM, VMware und Nutanix*)
  - Cloud VMs (*Azure, EC2, GCE*)
  - Container (*Docker, Kubernetes*)
- Inventarisierung von Hard- und Software
- Software-/Patch-Management und **Qualitätssicherung**
  - einfrieren getester Stände (**Content Lifecycle**)
  - Umgebungen sauber patchen (*Dev, Test, Prod*)

FEATURES

- Infrastructure as Code via **Salt**
- **Event-driven infrastructure**
  - selbstheilende Infrastruktur durch Reaktion auf Ereignisse (*z.B. Dienst gestoppt, Festplatte voll*)
- Mandanten- und auditierfähig
- Sicherheitschecks via **CVE** und **OpenSCAP**
- Monitoring via **Prometheus** und **Grafana**
- umfangreiche REST-API
- Übliche Administrationstätigkeiten
  - Pakete verwalten, Kommandos ausführen,...


Uyuni > Systems
0 systems selected
admin
SVA
Search page
Home
Systems
Overview
System List
System Groups
System Set Manager
Bootstrapping
Visualization
Advanced Search
Activation Keys
Stored Profiles
Custom System Info
Autoinstallation
Software Crashes
Virtual Host Managers
Clusters
Salt
Images
Patches
Copyright Notice
Uyuni release 2020.06
Uyuni-Client
Delete System
Add to SSM
Details
Software
Configuration
Provisioning
Groups
Audit
States
Formulas
Events
Patches
Packages
Software Channels
SP Migration
Relevant Patches
The following patches may currently be applied to this system.
Select All
51 - 75 of 87 (0 selected)
Apply Patches
All
Show
Filter by Synopsis:
Select first character
25
items per page
Type
Advisory
Synopsis
Status
Updated
openSUSE-2020-1162
important: Security update for libX11
N/A
08.08.20
openSUSE-2020-1160
Recommended update for opus
N/A
07.08.20
openSUSE-2020-1153
important: Security update for the Linux Kernel
N/A
06.08.20
openSUSE-2020-1142
important: Security update for ghostscript
N/A
04.08.20
openSUSE-2020-1138
Recommended update for systemd
N/A
03.08.20
openSUSE-2020-1133
Recommended update for python-kiwi
N/A
02.08.20

Uyuni - Systems | xccdf_org.open-scap_testresult_

Nicht sicher | localhost:8443/rhn/systems/details/audit/ScapResultDownload.do?sid=1000010001&xid=2&name=report.html

Rule results

14 passed | 15 failed

Severity of failed rules

15 other

Score

Scoring system	Score	Maximum	Percent
urn:xccdf:scoring:default	48.275864	100.000000	48.28%
urn:xccdf:scoring:flat	14.000000	29.000000	48.28%

Rule Overview

- [x] pass
- [x] fail
- [x] notchecked
- [x] fixed
- [x] error
- [x] notapplicable
- [x] informational
- [x] unknown

Search through XCCDF rules | Search

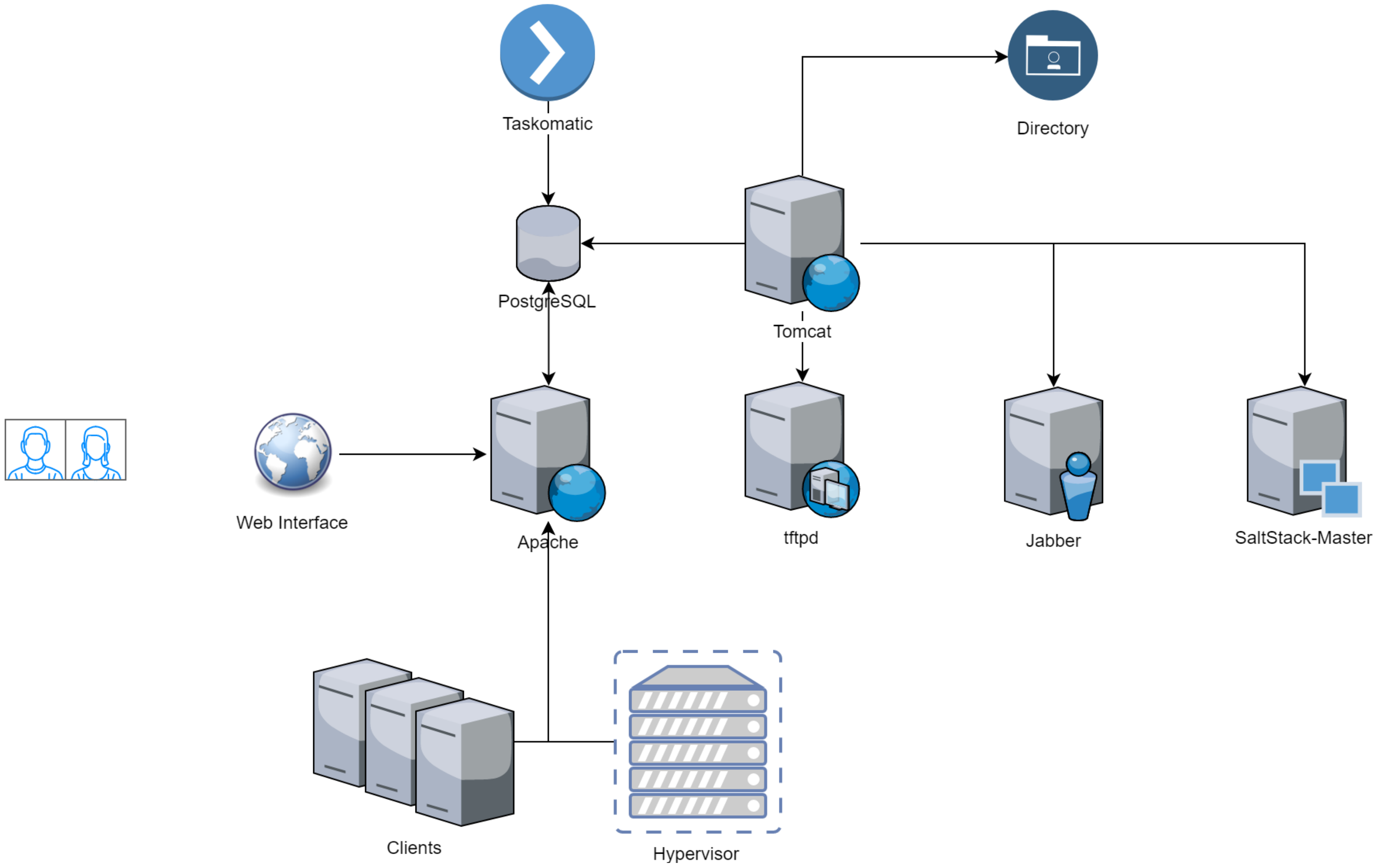
Group rules by: Default

Title	Severity	Result
Hardening Linux Kernel 15x fail		
sysctl net.ipv4.ip_forward must be 0	unknown	pass
sysctl net.ipv4.tcp_syncookies must be 1	unknown	pass
sysctl net.ipv6.conf.all.forwarding must be 0	unknown	pass
sysctl net.ipv6.conf.default.forwarding must be 0	unknown	pass
kernel config CONFIG_SYN_COOKIES must be y	unknown	fail
file /etc/login.defs must have a line that matches ^PASS_MAX_DAYS.*99999	unknown	pass
file /etc/login.defs must have a line that matches ^PASS_MIN_DAYS.*0	unknown	pass
file /etc/login.defs must have a line that matches ^PASS_WARN_AGE.*7	unknown	pass
file /etc/pam.d/common-password must have a line that matches minlen=6	unknown	fail

DISTRIBUTIONEN

- Server
  - openSUSE Leap 15.2 (*Uyuni*)
  - SLES 15 SP2 (*SUSE Manager 4.1*)
- Clients
  - SLES 11, 12, 15
  - openSUSE Leap 15
  - RHEL / CentOS / Oracle Linux 6+
  - Ubuntu 16.04, 18.04, 20.04
  - Debian 9, 10

ARCHITEKTUR

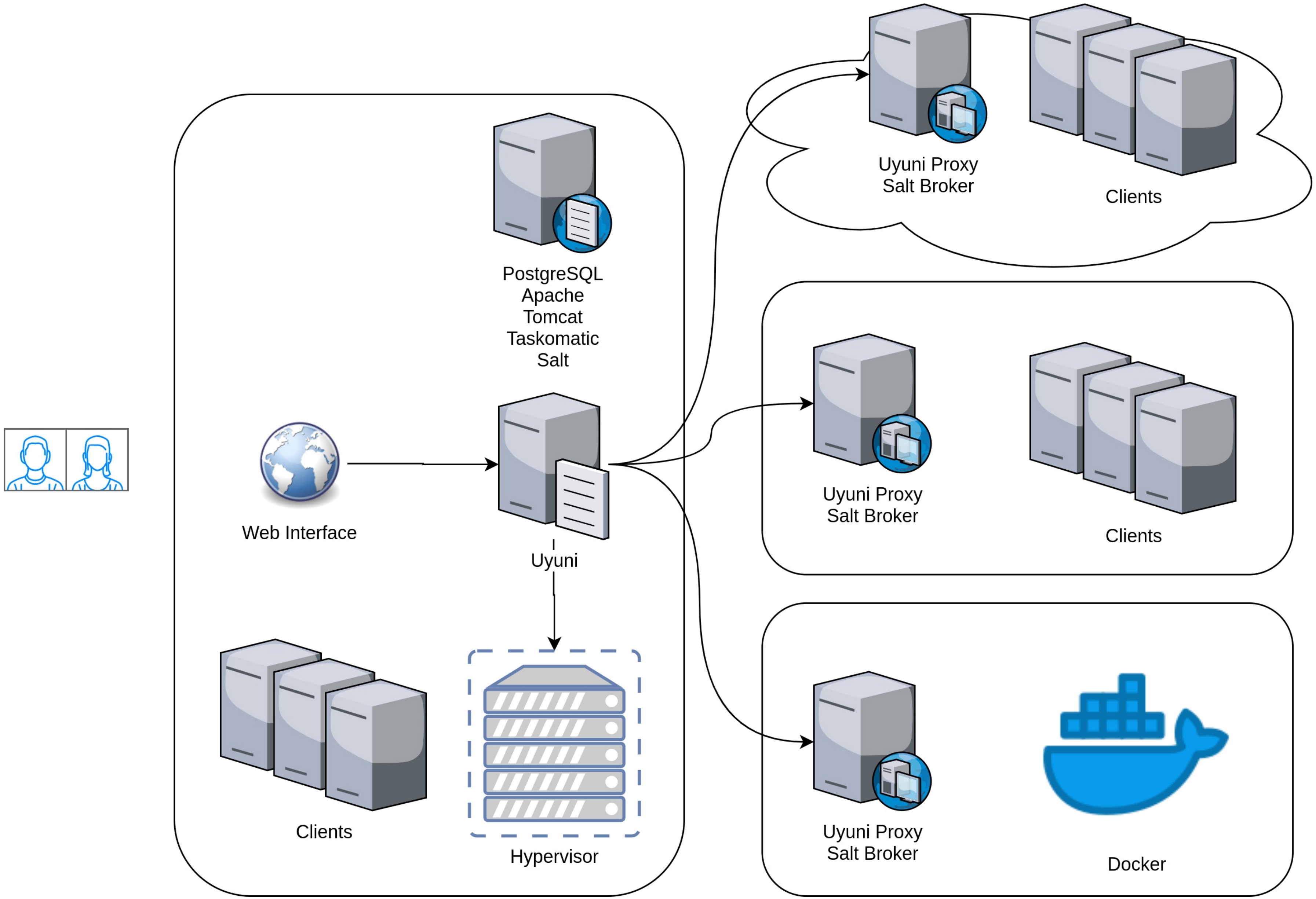


SETUPS

> Bei größeren Installationen kann der Einsatz von Uyuni Proxy-Servern **sinnvoll** sein
>
> > z.B. um Internet-Bandbreite einzusparen, Proxy-Server pro Standort/RZ

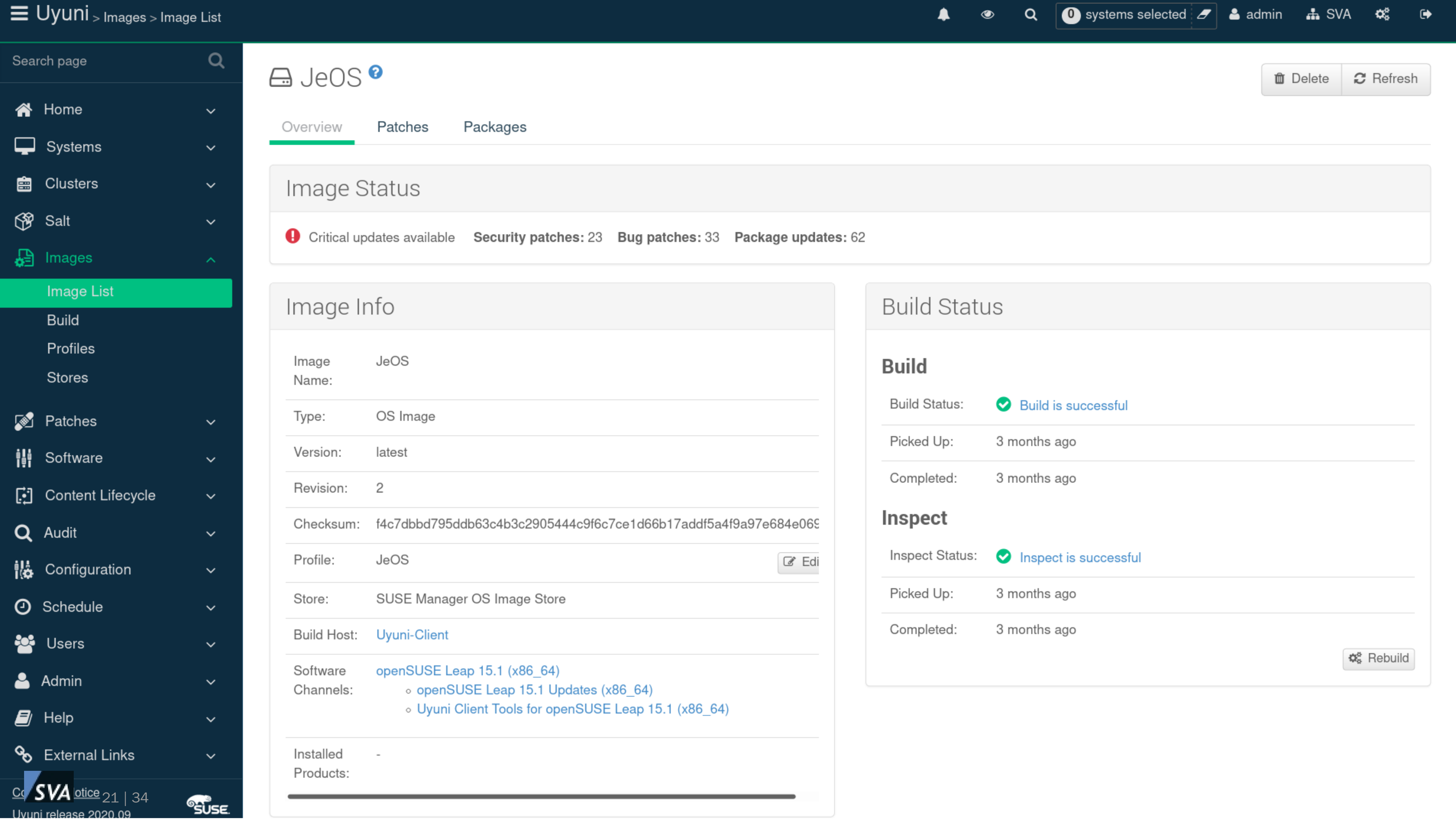
> Proxy besteht aus Squid-Installation und möglichen **Zusatzrollen**:
>
> > SaltStack Broker (*nicht direkt erreichbare Clients*)
>
> > PXE Boot

> Wartung von **Cloud**-Instanzen via Proxy


Uyuni Proxy
Salt Broker
Clients
PostgreSQL
Apache
Tomcat
Taskomatic
Salt
Uyuni Proxy
Salt Broker
Clients
Web Interface
Uyuni
Clients
Hypervisor
Uyuni Proxy
Salt Broker
Docker

SYSTEMVORLAGEN

- Uyuni unterstützt das Pflegen von Systemvorlagen:
  - Docker (*via* `Dockerfile`)
  - Kiwi (*für Bare-Metal und VMs*)
- Vorlagen können über die GUI **gepatcht** werden
  - vor allem für SLES interessant (*Subscription*)
- Integration in Container-Registries


Uyuni > Images > Image List
0 systems selected
admin
SVA
Search page
Home
Systems
Clusters
Salt
Images
Image List
Build
Profiles
Stores
Patches
Software
Content Lifecycle
Audit
Configuration
Schedule
Users
Admin
Help
External Links
Uyuni release 2020.09
JeOS
Delete
Refresh
Overview
Patches
Packages
Image Status
Critical updates available
Security patches: 23
Bug patches: 33
Package updates: 62
Image Info
Image Name: JeOS
Type: OS Image
Version: latest
Revision: 2
Checksum: f4c7dbbd795ddb63c4b3c2905444c9f6c7ce1d66b17addf5a4f9a97e684e06
Profile: JeOS
Edi
Store: SUSE Manager OS Image Store
Build Host: Uyuni-Client
Software Channels: openSUSE Leap 15.1 (x86_64)
openSUSE Leap 15.1 Updates (x86_64)
Uyuni Client Tools for openSUSE Leap 15.1 (x86_64)
Installed Products: -
Build Status
Build
Build Status: Build is successful
Picked Up: 3 months ago
Completed: 3 months ago
Inspect
Inspect Status: Inspect is successful
Picked Up: 3 months ago
Completed: 3 months ago
Rebuild

SALT IN A NUTSHELL

- In Python geschriebenes Configuration Management-Tool
- Salt **Master** konfiguriert **Minions** (*Clients*)
  - Client-Server-Modell, verschlüsselte Kommunikation via **ZeroMQ** oder SSH
- **States** definieren Soll-Zustand, Salt übernimmt Umsetzung
  - z.B. Benutzer mit Passwort, Applikation installieren
- **Grains** beschreiben ein System näher
  - z.B. CPU-Kerne, RAM-Größe,...
- kann auch Ansible-Code ausführen (`ansiblegate`)

UYUNI UND SALT

- Uyuni ist ein **vollwertiger** Salt Master
- Neue Systeme können über die GUI registriert werden
- States können auf mehreren Ebenen definiert werden:
  - Organisation
  - Hostgruppe
  - System
- Fremde Paketquellen werden automatisch entfernt
- Systemverwaltung in **Echtzeit**

SALT FORMULAS

- vordefinierter Salt-Code, Pendant zu Rollen
  - z.B. Konfigurieren von NTP
  - Anpassung über **Parameter** (*z.B. NTP-Server*)
- Integration in Web-Oberfläche
  - Formulas können Systemen zugeordnet werden
  - Konfiguration über Assistenten
- Zahlreiche Formulas (**~350**) auf GitHub

Uyuni > Systems

0 systems selected | admin | SVA

Search page

- Home
- Systems
  - Overview
  - System List
  - System Groups
  - System Set Manager
  - Bootstrapping
  - Visualization
  - Advanced Search
  - Activation Keys
  - Stored Profiles
  - Custom System Info
  - Autoinstallation
  - Software Crashes
  - Virtual Host Managers
- Clusters
- Salt
- Images
- Patches
- Software
- Content Lifecycle

Uyuni-Client

Delete System

Details | Software | Configuration | Provisioning | Groups | Audit | States | Formulas | Events

Configuration

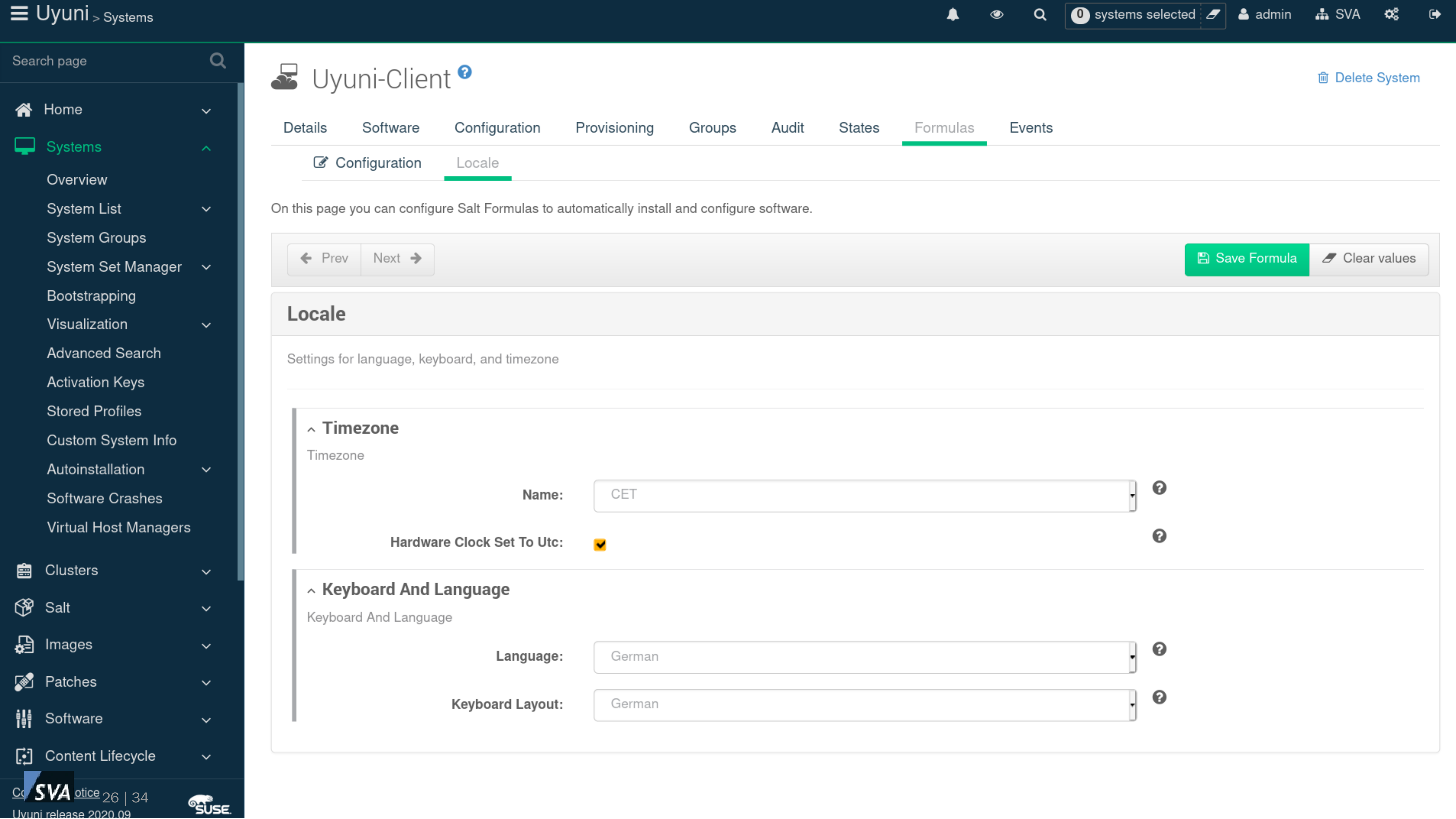
On this page you can select Salt Formulas for this group/system, which can then be configured on group and system level. This allows you to automatically install and configure software.

Save | Remove all | Reset Changes

Formulas

Choose formulas:

- [ ] **Clustering**
  - [ ] Caasp Management Node
  - [ ] Caasp Management Settings
- [ ] **Security Configuration**
  - [ ] Cpu Mitigations
- [-] **General System Configuration**
  - [x] Locale
  - [ ] Openvpn
  - [ ] System Lock
- [ ] **Hub**
  - [ ] Uyuni Config
- [ ] **Virtualization**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Images
Patches
Software
Content Lifecycle
Uyuni-Client
Delete System
Details
Software
Configuration
Provisioning
Groups
Audit
States
Formulas
Events
Configuration
Locale
On this page you can configure Salt Formulas to automatically install and configure software.
Prev
Next
Save Formula
Clear values
Locale
Settings for language, keyboard, and timezone
Timezone
Timezone
Name:
CET
Hardware Clock Set To Utc:
Keyboard And Language
Keyboard And Language
Language:
German
Keyboard Layout:
German
SVA
Uyuni release 2020.09
SUSE

MONITORING

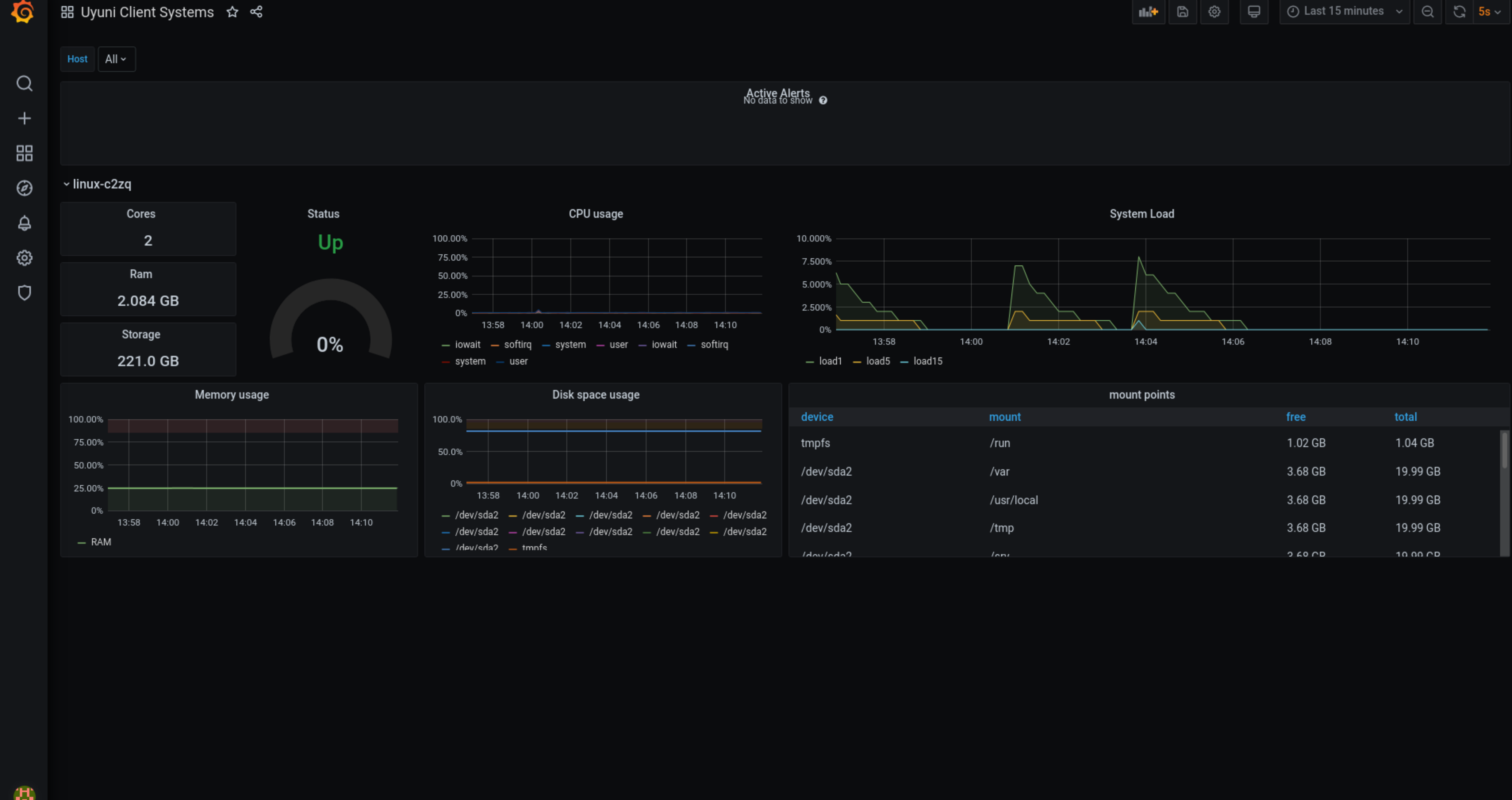
- Integration und Pakete für **Prometheus** und **Grafana**
- Uyuni-System **exportiert** vordefinierte Metriken, u.a.:
  - Hardware-Informationen (*CPU, RAM, Load*)
  - Netzwerk- und Disk-IO
  - PostgreSQL-, Apache- und Java-Metriken
- Auf Clients liefert der [Node-Exporter]() ebenfalls Metriken:
  - Hardware-Informationen
  - Dienst-Informationen
  - Kernel-Interna

MONITORING

- Mitgelieferte Pakete für:
  - SLES 12, 15
  - openSUSE 15.x
  - CentOS 6, 7, 8
- Pakete müssen auf **dediziertem** Server installiert werden
- automatische Konfiguration via **Salt Formulas**
- Auf Clients installierte Exporter werden automatisch auf dem Prometheus-Server als **Target** konfiguriert


Uyuni Server
Last 12 hours
5s
server
uyuni
Hardware
Cores
2
Ram
8.340 GB
Storage
157.5 GB
Status
Up
CPU now
2.4%
System Load
load average
load1
load5
load15
CPU usage
user
system
iowait
other
Network I/O
network-tx
network-rx
Disk space usage
mapper/vg_uyuni-lv_pgsql
mapper/vg_uyuni-lv_spacewalk
sda1
sda2
Memory usage
RAM
Disk I/O
disk-read
disk-write
mount points
device
mount
free
total
/dev/sda2 /var/cache 5.49 GB 19.61 GB
/dev/sda2 /var 5.49 GB 19.61 GB
/dev/sda2 /usr/local 5.49 GB 19.61 GB
/dev/sda2 /tmp 5.49 GB 19.61 GB
Insights
JVM - Tomcat
memory
threads
Database Operations
operations
locks
fetched
inserted
updated
deleted
Taskomatic Scheduler
tasks
tasks completed
SVA


PostgreSQL database insights
Last 5 minutes
5s
Host
All
Database Server: All
Fetches
200 ops
150 ops
100 ops
50 ops
0 ops
14:07:00
14:07:30
14:08:00
14:08:30
14:09:00
14:09:30
14:10:00
14:10:30
14:11:00
14:11:30
Value
postgres
template0
template1
uyuni
Inserts
1.0 ops
0.5 ops
0 ops
Updates
3.0 ops
2.0 ops
1.0 ops
0 ops
Deletes
0.4 ops
0.3 ops
0.2 ops
0.1 ops
0 ops
Locks
10
5
0
accessexclusivelock
accesssharelock
exclusivelock
rowexclusivelock
rowsharelock
sharelock
sharerowexclusivelock
shareupdateexclusivelock
Commits vs rollbacks
300 K
200 K
100 K
0
commits
rollbacks
Connections
40
30
20
10
0
14:06:40
14:06:50
14:07:00
14:07:10
14:07:20
14:07:30
14:07:40
14:07:50
14:08:00
14:08:10
14:08:20
14:08:30
14:08:40
14:08:50
14:09:00
14:09:10
14:09:20
14:09:30
14:09:40
14:09:50
14:10:00
14:10:10
14:10:20
14:10:30
14:10:40
14:10:50
14:11:00
14:11:10
14:11:20
14:11:30
active
disabled
fastpath function call
idle
idle in transaction
idle in transaction (aborted)



Uyuni Client Systems
Last 15 minutes
5s
Host
All
Active Alerts
No data to show
linux-c2zq
Cores
2
Ram
2.084 GB
Storage
221.0 GB
Status
Up
0%
CPU usage
100.00%
75.00%
50.00%
25.00%
0%
13:58 14:00 14:02 14:04 14:06 14:08 14:10
iowait softirq system user iowait softirq system user
System Load
10.000%
7.500%
5.000%
2.500%
0%
13:58 14:00 14:02 14:04 14:06 14:08 14:10
load1 load5 load15
Memory usage
100.00%
75.00%
50.00%
25.00%
0%
13:58 14:00 14:02 14:04 14:06 14:08 14:10
RAM
Disk space usage
100.0%
50.0%
0%
13:58 14:00 14:02 14:04 14:06 14:08 14:10
/dev/sda2 /dev/sda2 /dev/sda2 /dev/sda2 /dev/sda2
/dev/sda2 /dev/sda2 /dev/sda2 /dev/sda2 /dev/sda2
tmpfs
mount points
device mount free total
tmpfs /run 1.02 GB 1.04 GB
/dev/sda2 /var 3.68 GB 19.99 GB
/dev/sda2 /usr/local 3.68 GB 19.99 GB
/dev/sda2 /tmp 3.68 GB 19.99 GB

AUSBLICK

Für die Zukunft sind zahlreiche Funktionen geplant:

- Active Directory und Samba-Authentifizierung
- Debian- und Ubuntu-Errata
- Unterstützung weiterer Betriebssysteme
  - Amazon Linux 2
  - Microsoft Windows [**sic!**]
  - Apple macOS
  - Android

LINKS

> Blog-Artikel und Screencast über *Event-driven infrastructure*

> Ansible-Rolle für Uyuni und SUSE Manager

> Uyuni-Projektseite

DANKE FÜR DIE AUFMERKSAMKEIT

FRAGEN?