# Open Source Virtualisierung mit oVirt

DI (FH) René Koch

# Agenda

▶ Einführung

▶ Komponenten

▶ Erweiterungen & Monitoring

▶ Use Cases & Herausforderungen
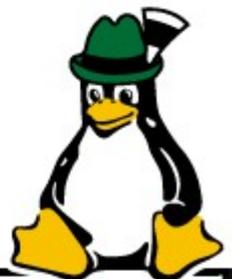
# Einführung – oVirt

▶ **Zentralisiertes Management für Server und Desktop-Virtualisierung**

▶ **Basierend auf KVM**

▶ **Führend bei Performance, Skalierbarkeit und Sicherheit**

▶ **Open Source Alternative zu VMware vSphere/vCenter**
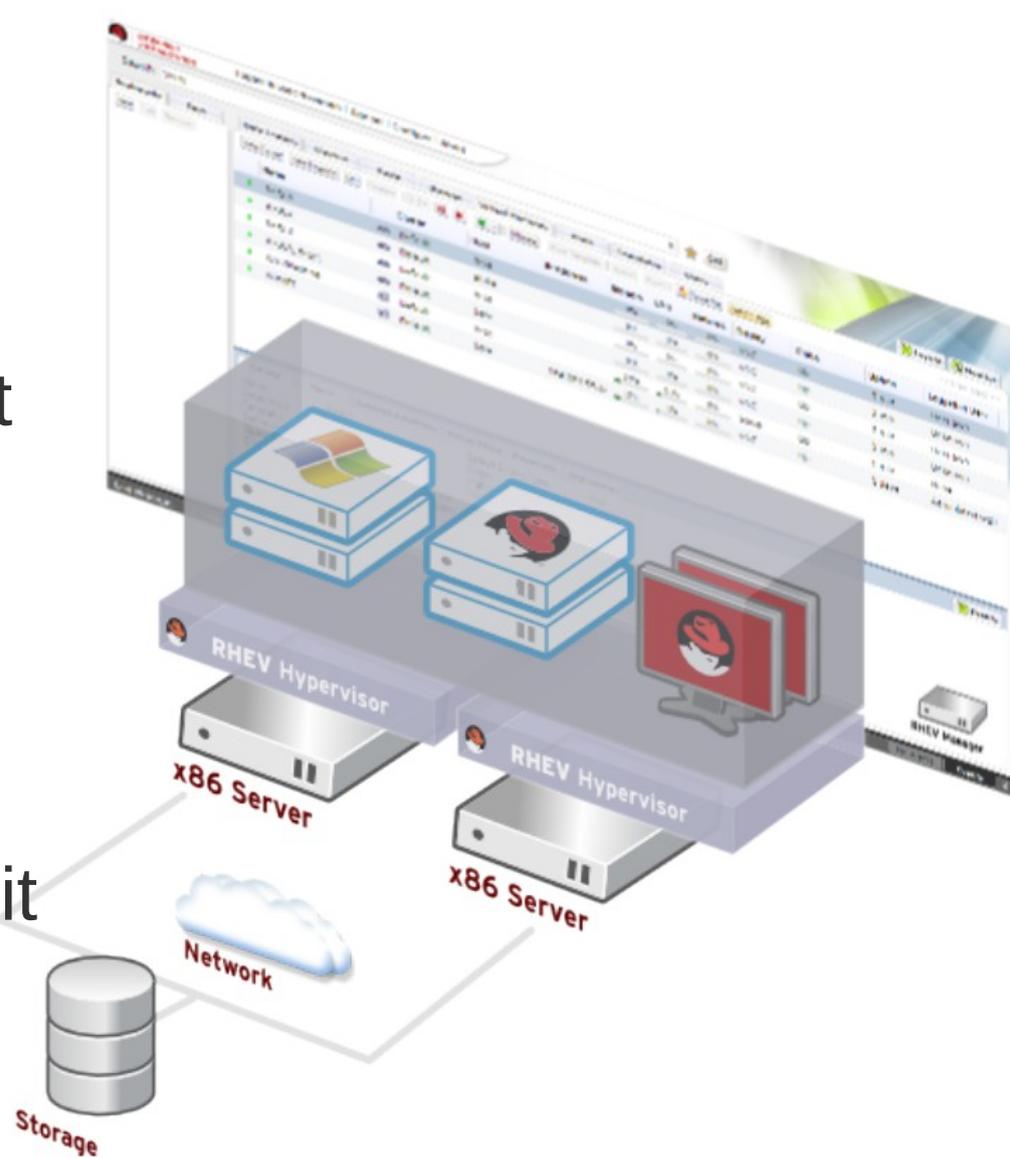
# Einführung – oVirt
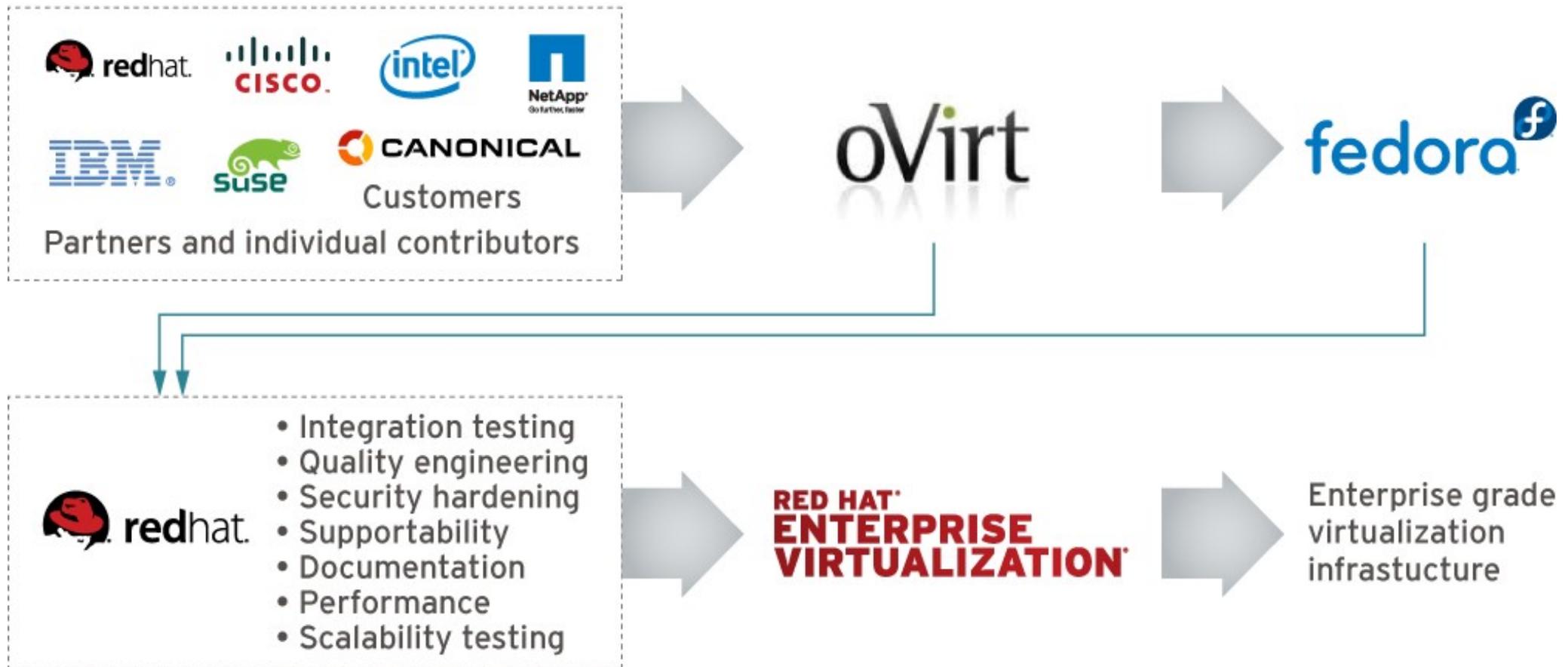
# Komponenten

▷ oVirt Node (Hypervisor)

▷ oVirt Engine (Management-Server)

▷ User Portal

▷ Self-Provisioning Portal

▷ REST-API, Python-, Java-SDK

▷ oVirt-Shell

▷ Reporting Engine

▷ UI-Plugins
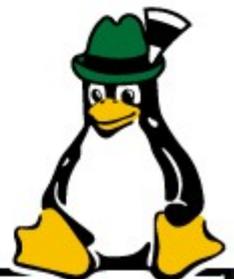
# Komponenten - Architektur

# Komponenten – oVirt Node



Virtual Machine  Virtual Machine

KVM

Linux Kernel

intel VT-X

AMD AMD-V
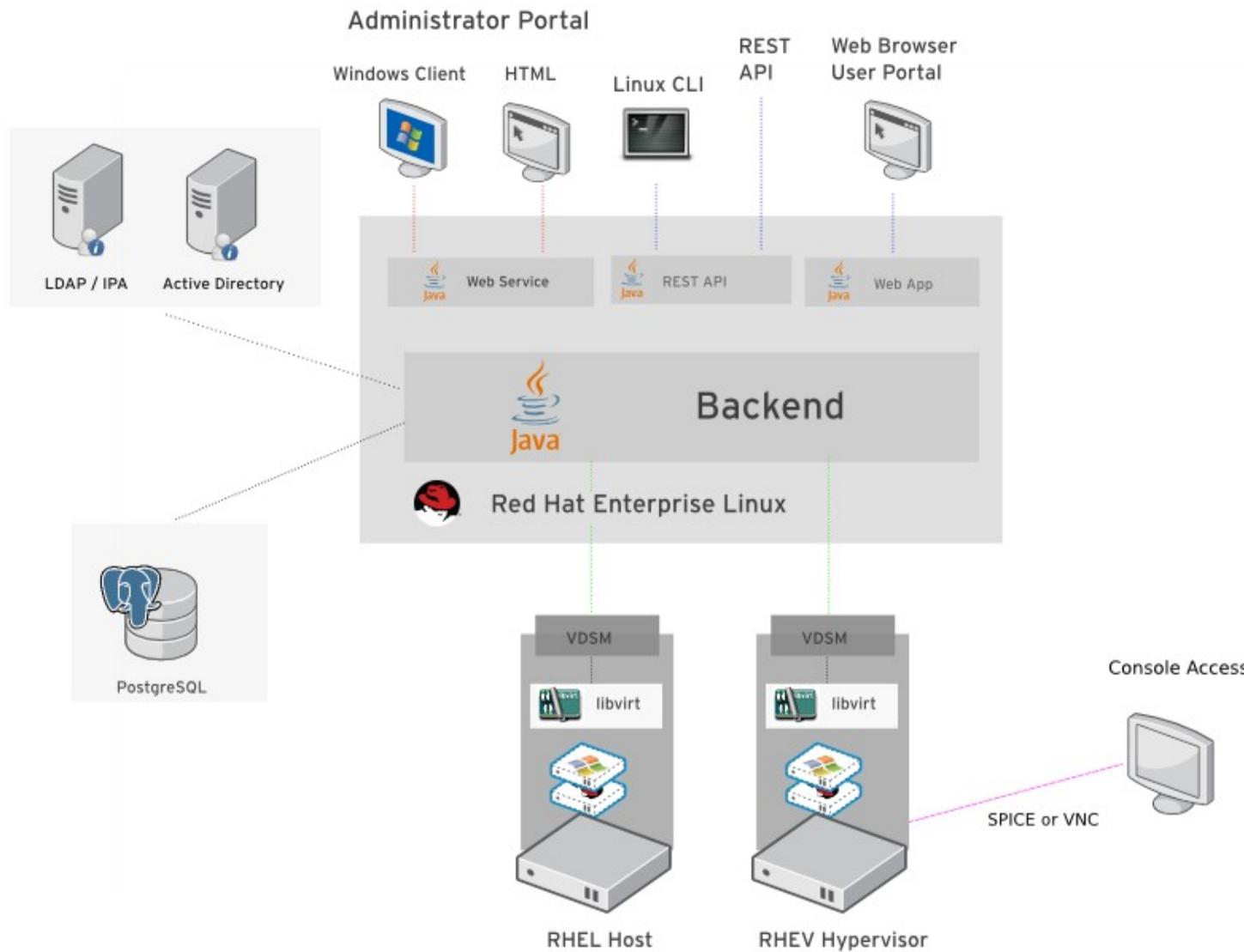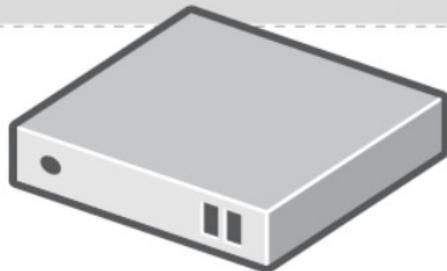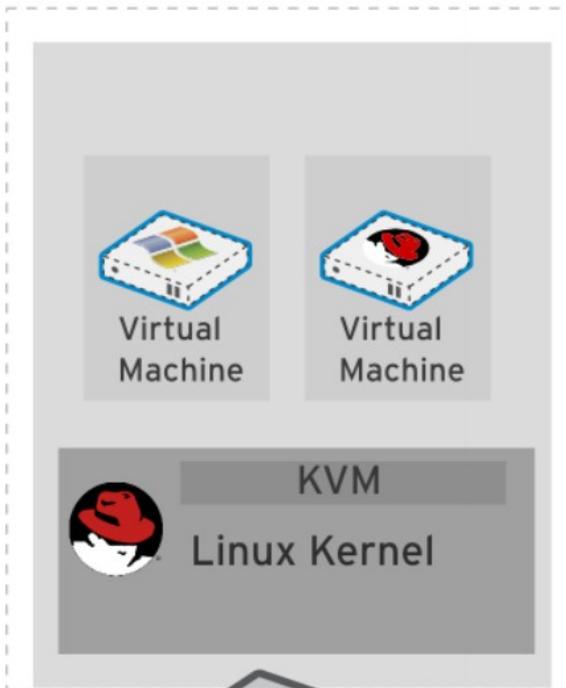
x86 Hardware

▶ **Standalone Hypervisor**

- Geringe Größe < 200MB

- Minimales Fedora + KVM

- Sicherheitsfeatures (read-only, iptables und SELinux)

- Läuft auf allen Servern mit Intel VT/AMD-V CPUs

- Einfache Installation, Konfiguration und Upgrademöglichkeit

- Installation via PXE-Boot, USB-Boot, CD oder Festplatte
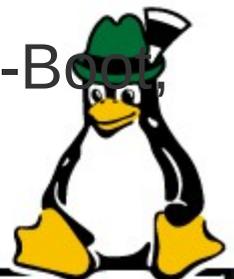
# Komponenten – Fedora/CentOS Hypervisor
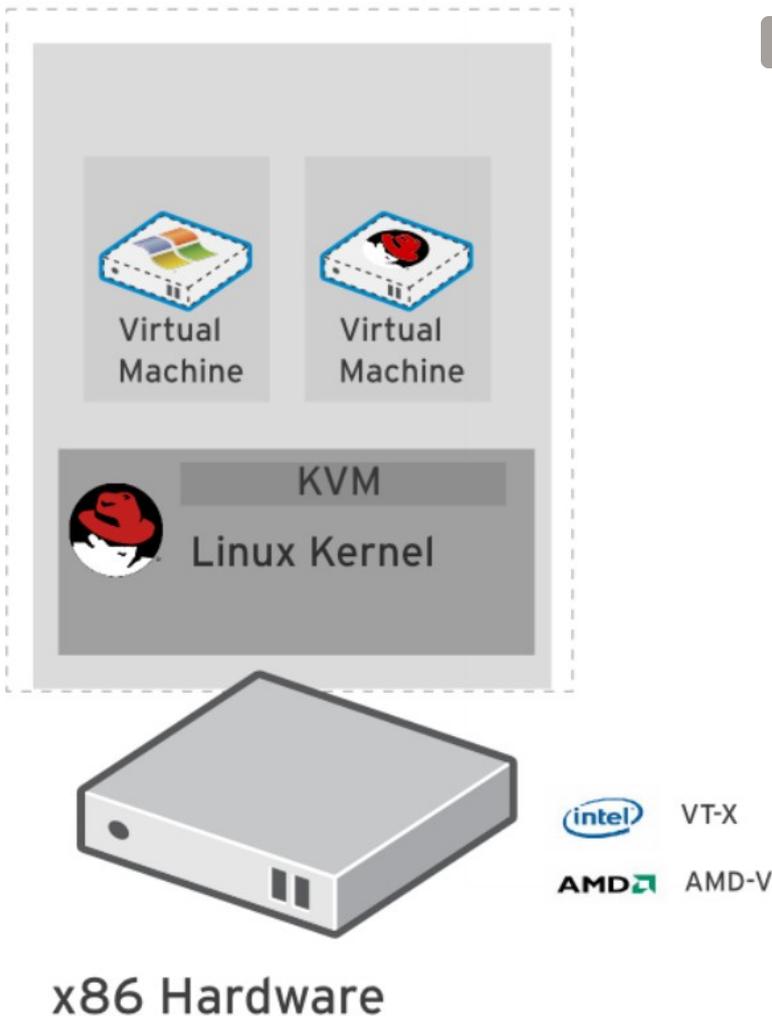


▶ Fedora 18 / CentOS 6

- Fedora/CentOS + KVM
- Sicherheitsfeatures (SELinux, iptables,...)
- Läuft auf allen Servern mit Intel VT/AMD-V CPUs
- Benutzerdefinierte Installation, Konfiguration und Upgrade-möglichkeit
- Unterstützt Hook-Skripte
- Installation via PXE-Boot, USB-Boot, CD oder Festplatte
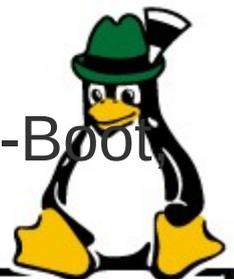
# Komponenten – oVirt Engine

- Hochverfügbarkeit
- Live Migration
- Load Balancing (DRS)
- Power Saver (DPM)
- Maintenance Manager (oVirt Node Updates)
- Image Management (Templates, Thin Provisioning, Snapshots)
- Zentrales Storage- und Netzwerkmanagement
- Monitoring und Reporting
- V2V und P2V (VMware, XEN, KVM -> oVirt)
- VDI für Windows und Linux Gäste

# Komponenten – oVirt Engine

# Komponenten – oVirt Engine

▶ Storage

▶ Data Domain

 – NFS

 – iSCSI

 – Fibre Channel

 – POSIX compliant storage

 – Local on host

▶ ISO Domain

▶ Export Domain
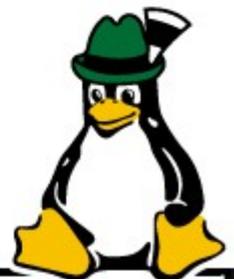
# Komponenten – oVirt Engine

▶ GlusterFS-Support für GlusterFS 3.4 (alpha)

# Komponenten – oVirt Engine

▷ Virtuelle Maschinen

# Komponenten – oVirt Engine

▷ Suche über Datacenter hinweg

▷ Kombination verschiedenster Parameter

▷ Bookmarken von Suchoperationen

# Komponenten - VDI

**Virtual Desktop Infrastructure**



▶ Zentralisiertes Management

▶ Virtuelle Desktops mit „physical PC experience"

- Mehrere Monitore

- HD Videos

- Bi-direktionale Audio/Video-Übertragungen für VoIP und Videokonferenzen

- Smartcard Unterstützung

- USB Unterstützung

▶ Windows und Linux-Gäste

▶ Desktop Pools
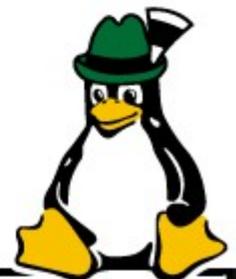
# Komponenten – User Portal

# Komponenten – Self-Provisioning Portal

▷ Self-Provisioning virtueller Maschinen

# Komponenten - REST-API

▶ Representational State Transfer

▶ HTTP-Aktionen:
- GET
- PUT
- POST
- DELETE

▶ (Fast) alle Tasks möglich wie im Admin-Portal

```xml
-<hosts>
 -<host href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4" id="4a5801d8-17b1-11e1-84ed
  -<actions>
    <link href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4/deactivate" rel="deactivate
    <link href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4/approve" rel="approve"/>
    <link href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4/iscsilogin" rel="iscsilogin"/
    <link href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4/iscsidiscover" rel="iscsidisc
    <link href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4/commitnetconfig" rel="com
    <link href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4/fence" rel="fence"/>
    <link href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4/install" rel="install"/>
    <link href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4/activate" rel="activate"/>
  </actions>
  <name>rhevh.lab.ovido.at</name>
  <link href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4/storage" rel="storage"/>
  <link href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4/nics" rel="nics"/>
  <link href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4/tags" rel="tags"/>
  <link href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4/permissions" rel="permission
  <link href="/api/hosts/4a5801d8-17b1-11e1-84ed-0025901dd0b4/statistics" rel="statistics"/>
  <address>10.0.100.12</address>
 -<certificate>
   <organization>ovido it solutions</organization>
   <subject>O=ovido it solutions,CN=10.0.100.12</subject>
  </certificate>
 -<status>
   <state>up</state>
  </status>
```

# Komponenten – Python/JAVA-SDK

▶ JAVA-SDK ab oVirt 3.2

▶ Python-SDK:

```
from ovirtsdk.api import API
from ovirtsdk.xml import params
try:
    api = API (url="https://HOST",
                username="USER",
                password="PASS",
                ca_file="ca.crt")
    print "Connected to %s successfully!" % api.get_product_info().name
    api.disconnect()
except Exception as ex:
    print "Unexpected error: %s" % ex
```

Connected to Red Hat Enterprise Virtualization Manager successfully!
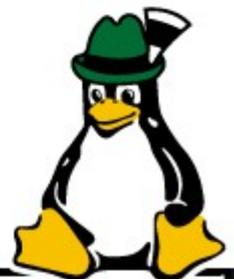
# Komponenten – oVirt-Shell

▶ CLI-Interface für oVirt

```
# ovirt-shell -c -l "https://ovirt-engine/api" -P 443 -u
"admin@internal" -p 'secret'

[oVirt shell (connected)]# list vms | grep fedora
name        : fedora18-icinga
name        : fedora-packaging


[oVirt shell (connected)]# show vm
id              name            storagedomain
[oVirt shell (connected)]# show vm --name debian6

id                      : 22058af2-6d97-4d59-b234-516431f2d215
name                    : debian6
cluster-id              : f3e98007-3695-4f28-aaa7-5b9df50119aa
cpu-mode                : CUSTOM
cpu-topology-cores      : 1
cpu-topology-sockets    : 1
```
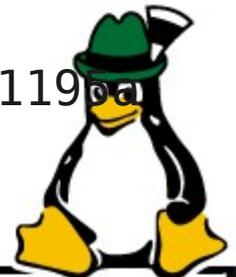
# Komponenten – UI Plugins

▶ Infrastruktur und API zum Erstellen von User Interface Plugins für oVirt-Engine

▶ Verfügbar ab oVirt 3.2

▶ Erweiterung durch:

- Main Tabs

- Sub Tabs

- Buttons

▶ Informationen: http://www.ovirt.org/Features/UIPlugins
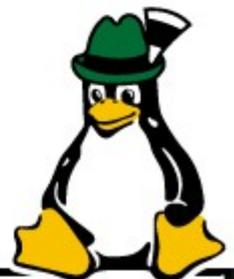
# Komponenten – UI Plugins

▶ oVirt Monitoring UI Plugin

▶ Author: René Koch <r.koch@ovido.at>

▶ Project web site:
https://labs.ovido.at/monitoring/wiki/ovirt-monitoring-ui-plugin

▶ Installation documentation:
https://labs.ovido.at/monitoring/wiki/ovirt-monitoring-ui-plugin:install

▶ UI plugin source code:
https://labs.ovido.at/monitoring/wiki/ovirt-monitoring-ui-plugin:svn

# Komponenten – UI Plugins

▶oVirt Monitoring UI Plugin

# Komponenten – UI Plugins

▶ oVirt Monitoring UI Plugin

# Monitoring

▶ Überwachung einer RHEV und oVirt-Umgebung mittels Icinga/Nagios

▶ **check_rhev3**

- Author: René Koch <r.koch@ovido.at>

- Project web site:
  https://labs.ovido.at/monitoring/wiki/check_rhev3
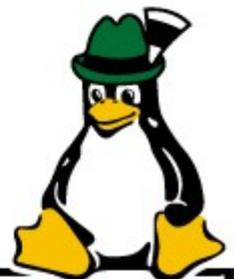
# Monitoring - check_rhev3

▶ Überwachung von:

- – Datacenter
- – Cluster
- – Hosts
- – Storagedomains
- – Virtual Machines
- – Virtual Machine Pools
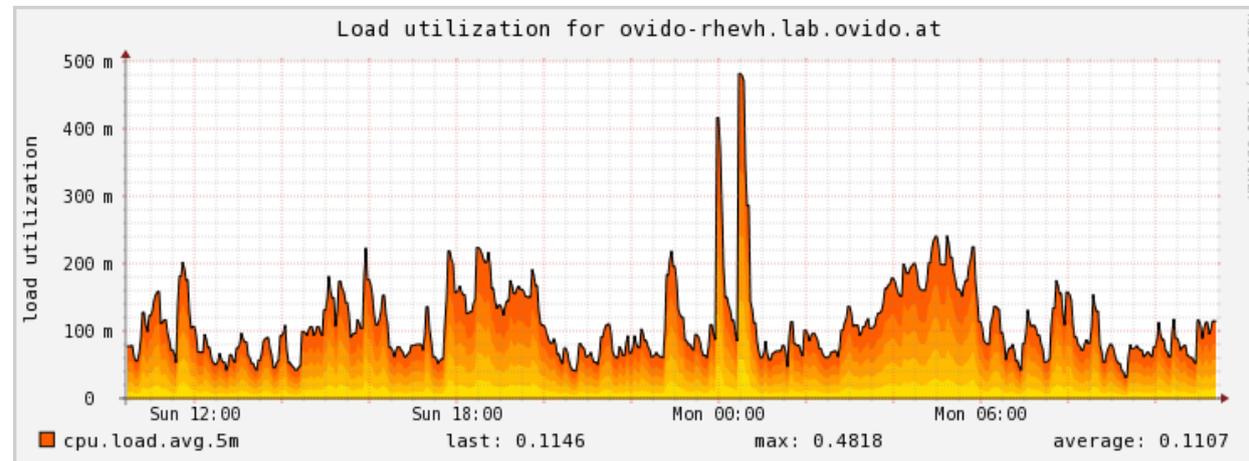


```
$ check_rhev3 -H ovirt-engine -a admin@internal:password -D default -l status
RHEV OK: Datacenters ok - 1/1 Datacenters with state UP|Datacenters=1;1;1;0
```
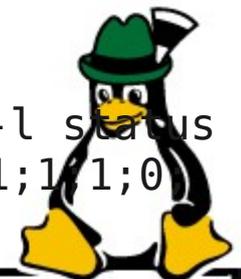
# Use Cases

▶ Server-Virtualisierung

▶ Desktop-Virtualisierung

▶ Private Clouds

- Abrechnung von Ressourcen-Auslastung oder Laufzeit via PostgreSQL-Datenbank

- Entwickler-Portal

▶ Virtualisierte Call Center

▶ Anbindung von Außenstellen
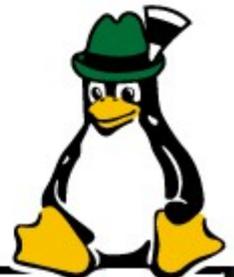
# Herausforderungen

▷ Benötigt SAN/NAS

▷ Lokales Storage vermeiden (NFS besser)

▷ Komplexe Netzwerkkonfiguration etwas mühsam konfigurierbar

▷ Verhalten teilweise konservativ

▷ Funktioniert wie Cluster→Fencing!

▷ Nicht alles via GUI lösbar (z.B. Manager-Updates)

▷ Fedora ist nicht optimal als Grundlage für oVirt
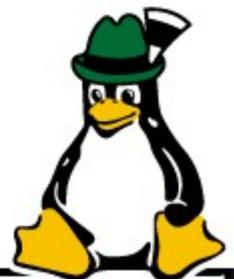
# Weitere Informationen - oVirt

▶ Webseite: http://www.ovirt.org/Home

▶ Dokumentation:
http://www.ovirt.org/Documentation

▶ Download: http://www.ovirt.org/Download

▶ Mailinglisten: http://www.ovirt.org/Mailing_lists
users@ovirt.org - User Mailingliste

▶ oVirt Live (CD): http://wiki.ovirt.org/OVirt_Live
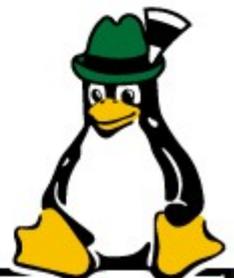
# Weitere Informationen - Referent

▶ Name: René Koch

▶ E-Mail: r.koch@ovido.at

▶ Nagios-Plugins für RHEV/oVirt:
https://labs.ovido.at/monitoring/wiki
/check_rhev3

▶ oVirt Monitoring UI Plugin:
https://labs.ovido.at/monitoring/wiki/
ovirt-monitoring-ui-plugin
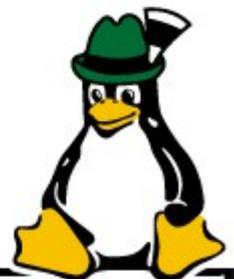
# Herzlichen Dank für Ihre Aufmerksamkeit!