

# OpenStack bei der SAP SE

Integration bestehender Dienste in OpenStack dank Workflow Engine  
und angepasstem Webinterface

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# Vorstellung B1 Systems

- gegründet 2004
- primär Linux/Open Source-Themen
- national & international tätig
- über 60 Mitarbeiter
- unabhängig von Soft- und Hardware-Herstellern
- Leistungsangebot:
  - Beratung & Consulting
  - Support
  - Entwicklung
  - Training
  - Betrieb
  - Lösungen
- dezentrale Strukturen

## Schwerpunkte

- Virtualisierung (XEN, KVM & RHEV)
- Systemmanagement (Spacewalk, Red Hat Satellite, SUSE Manager)
- Konfigurationsmanagement (Puppet & Chef)
- Monitoring (Nagios & Icinga)
- IaaS Cloud (OpenStack & SUSE Cloud & RDO)
- Hochverfügbarkeit (Pacemaker)
- Shared Storage (GPFS, OCFS2, DRBD & CEPH)
- Dateiaustausch (ownCloud)
- Paketierung (Open Build Service)
- Administratoren oder Entwickler zur Unterstützung des Teams vor Ort

# OpenStack bei der SAP SE mit Workflow Engine & angepasstem Webinterface

- B1 Systems als Lieferant/Dienstleister der SAP für OpenStack
- Ausgangspunkt: OpenStack Folsom Release mit 150 XEN Hypervisoren
- Ziel: OpenStack-Icehouse-Lösung mit voller Integration bestehender SAP-Dienste

# B1 Systems als Lieferant der SAP für OpenStack

- Xen-Implementierung für SAP seit 2007
- erster SAP OpenStack POC 2011
- OpenStack Know-How für kundenspezifische Anpassungen
- Support für das gesamte Paket aus einer Hand 24/7
- OpenStack-Upstream-Entwicklung seit Anfang 2011
- Top Ten Contributor Juno Release
- Platz 14 Contributor Kilo Release
- ein OpenStack Core Reviewer

# OpenStack Commits (Stand 9/2014)

## Contribution by companies

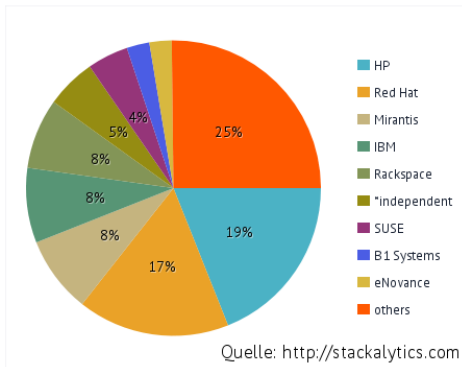


Abbildung : Stackalytics Juno

# B1 OpenStack Betrieb für SAP SE

- Architekturkonzeption
- Hochverfügbarkeit
- Custom-Dev-Anpassungen
- Implementierungsplanung
- Tools Integration
- Betrieb
- Schulung 1st & 2nd Level Support
- 24/7 3rd Level Support

## Bestehende OpenStack Landschaft: Folsom

- Folsom Release
- 155 XEN Compute Nodes
- 2500 VMs
- 85 TB RAM
- 4 Availability Zones



# Folsom OpenStack gesteuert von SAPs C<sup>3</sup> Interface

## C<sup>3</sup>: Corporate Compute Cloud

- Kundenfrontend zur Bestellung von VMs
- CMDB Integration (SISM)
- Host Name Generator
- DNS-Integration (IP Address Manager)

# SAP C<sup>3</sup>

SAP C<sup>3</sup> Welcome Christian Wolter [Refresh](#) [IT-Ticket](#) [Logout](#) [Help](#)

View Broadcast

Submitted Requests

- Needs Attention 0
- Drafts 0
- Since Last Visit 0
- Open Requests 0

Quick Picks

- [Reconfigure your virtual in](#)
- [Delete your virtual instance](#)

Action Menu

- [Service Categories](#)
- [User Preferences](#)
- [Answer Surveys](#)
- [Suggestion](#)
- [Request On Behalf Of...](#)

Search XEN for

XEN

### Services

1 - 5 of 5 [Previous](#) [Next](#)

|  |   |                                  |                             |
|--|---|----------------------------------|-----------------------------|
|  | <b>Create XEN instance</b><br>Create XEN instance         | <a href="#">Add to Favorites</a> | <a href="#">Request Now</a> |
|  | <b>Delete XEN Instance</b><br>Delete XEN virtual instance | <a href="#">Add to Favorites</a> | <a href="#">Request Now</a> |
|  | <b>Reboot XEN Instance</b><br>Reboot XEN virtual instance | <a href="#">Add to Favorites</a> | <a href="#">Request Now</a> |
|  | <b>Start XEN Instance</b><br>Start XEN virtual instance   | <a href="#">Add to Favorites</a> | <a href="#">Request Now</a> |
|  | <b>Stop XEN Instance</b><br>Stop XEN virtual instance     | <a href="#">Add to Favorites</a> | <a href="#">Request Now</a> |

## Vorteile der bestehenden Folsom-Landschaft

- stabiler Betrieb
- hohe Kundenzufriedenheit
- leichte Erweiterbarkeit dank Konfiguration mit Puppet

# Gründe für das Upgrade auf Icehouse

- veraltetes OpenStack Release
- paravirtualisiert dadurch keine Windows VMs
- Feature-Entwicklung abhängig von SAP C<sup>3</sup> Frontend
- kein Update auf SLES 11 SP3 oder höher möglich

## Direktes Upgrade kaum möglich

- zu viele Änderungen auf OpenStack Seite
- stabile Landschaft wäre durch Updates gefährdet
- Rolling Updates erst seit Icehouse möglich

# Parallele OpenStack Installation mit Icehouse

Ziel der neuen Implementierung:

- unabhängiger Betrieb von  $C^3$
- Einsatz von Multi Tenancy
- Volume Service mit Cinder
- High Performance Resource Pool für rechenintensive Anwendungsfälle
- Service für dedizierte Hardware Ressourcen (CPU und RAM)
- Möglichkeit neuer Features wie vIP und Aliasing für VMs
- Integration von SAPs internen Diensten

# Parallele OpenStack Installation mit Icehouse

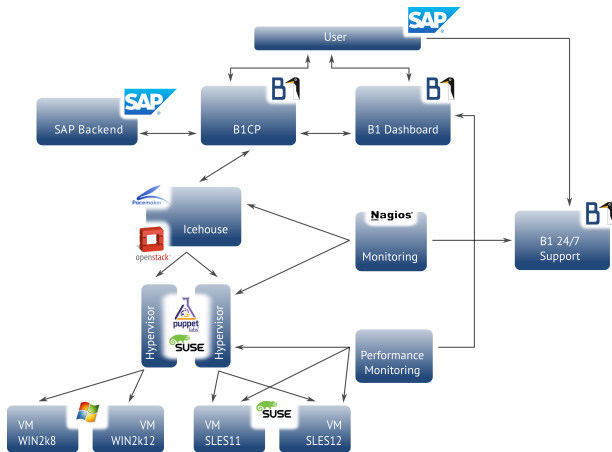


Abbildung : Icehouse-Landschaft

# Erweiterung von OpenStack durch weitere Tools

- hochverfügbare OpenStack-Infrastrukturdienste mit Virtual System Cluster (VSC)
- Puppet-basierte, zentral verwaltete Installation und Konfiguration
- Server Monitoring mit Nagios
- Utilization & Performance Graphen mit graphite & collectd
- Netzwerk-Latenz-Monitoring mit Smokeping
- eigens entwickeltes Web Dashboard
- B1 Cloud Portal



## Features des B1CP

- Erstellen von VMs mit Attributen der SAP CMDB
- Änderungen an der SAP CMDB via Portal
- VM Zugriff über B1CP
- Erstellen von virtuellen IPs
- Erstellen von Host Aliases
- Nachvollziehbarkeit der Workflows während der VM-Erstellung

# SAP-Adapter-API

- Schnittstelle zwischen OpenStack und SAP APIs
- Integration von HNG, SISM, IPAM
- Persistierung der OpenStack-Daten
- Abgleich der B1CP CMDB mit der SAP CMDB (SISM)

# Horizon als Basis für B1CP

Vorteile von Horizon als Basis:

- Clean Code mit Python
- Python Django Support dank großer Community
- benutzerfreundliches Interface
- OpenStack Horizon Support
- sehr gute Dokumentation zur Panelentwicklung
- Funktionalität bereits vorhanden
- Horizon Look and Feel

# Neues Interface: B1 Cloud Portal

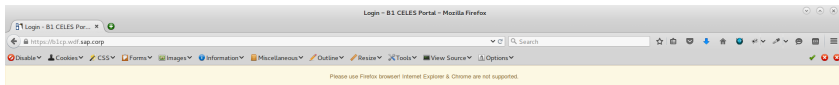


Abbildung : Login Screen

# Neues Interface: B1 Cloud Portal

Instances - B1 CELES Portal - Mozilla Firefox

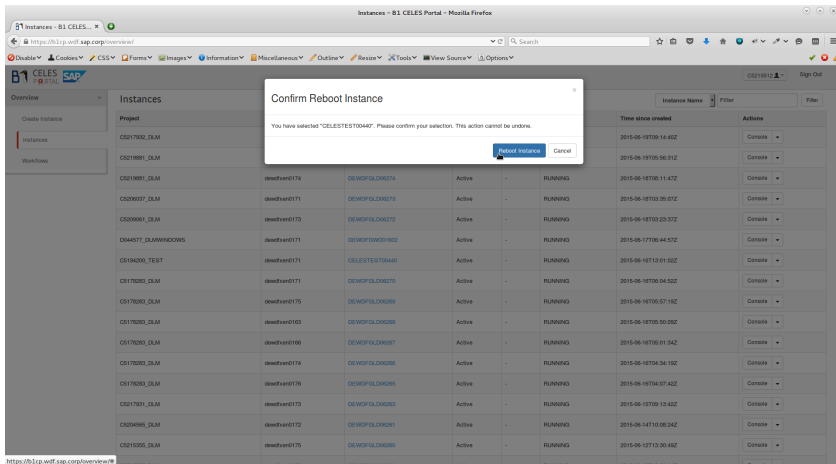
Instances - B1 CELES Portal

Instances Name Filter

| Project            | Host        | Name            | Status | Task                 | Power State | Time since created   | Actions   |
|--------------------|-------------|-----------------|--------|----------------------|-------------|----------------------|---|
| -                  | dewdfen0163 | DEWDFGLD06277   | Build  | Block Device Mapping | NO STATE    | 2015-06-19T09:14:40Z |   |
| CS219891_DUM       | dewdfen0166 | DEWDFGLD06276   | Active | -                    | RUNNING     | 2015-06-19T05:56:31Z | Console   |
| CS219891_DUM       | dewdfen0174 | DEWDFGLD06274   | Active | -                    | RUNNING     | 2015-06-18T06:11:47Z | Console   |
| CS206037_DUM       | dewdfen0171 | DEWDFGLD06273   | Active | -                    | RUNNING     | 2015-06-18T03:36:07Z | Console   |
| CS209061_DUM       | dewdfen0173 | DEWDFGLD06272   | Active | -                    | RUNNING     | 2015-06-18T03:23:37Z | Console   |
| D044577_DUMWINDOWS | dewdfen0171 | DEWDFGLD061602  | Active | -                    | RUNNING     | 2015-06-17T06:44:57Z | Console   |
| CS194300_TEST      | dewdfen0171 | CELES-TEST00440 | Active | -                    | RUNNING     | 2015-06-16T13:01:02Z | Console   |
| CS178283_DUM       | dewdfen0171 | DEWDFGLD06270   | Active | -                    | RUNNING     | 2015-06-16T06:04:52Z | Shut Off Instance<br>Reboot Instance<br>Delete Instance |
| CS178283_DUM       | dewdfen0175 | DEWDFGLD06269   | Active | -                    | RUNNING     | 2015-06-16T05:57:19Z | Console   |
| CS178283_DUM       | dewdfen0163 | DEWDFGLD06268   | Active | -                    | RUNNING     | 2015-06-16T05:50:09Z | Console   |
| CS178283_DUM       | dewdfen0166 | DEWDFGLD06267   | Active | -                    | RUNNING     | 2015-06-16T05:01:34Z | Console   |
| CS178283_DUM       | dewdfen0174 | DEWDFGLD06266   | Active | -                    | RUNNING     | 2015-06-16T04:34:19Z | Console   |
| CS178283_DUM       | dewdfen0176 | DEWDFGLD06265   | Active | -                    | RUNNING     | 2015-06-16T04:07:42Z | Console   |
| CS217931_DUM       | dewdfen0173 | DEWDFGLD06263   | Active | -                    | RUNNING     | 2015-06-15T09:13:42Z | Console   |
| CS204965_DUM       | dewdfen0172 | DEWDFGLD06261   | Active | -                    | RUNNING     | 2015-06-14T10:08:24Z | Console   |
| CS215359_DUM       | dewdfen0175 | DEWDFGLD06260   | Active | -                    | RUNNING     | 2015-06-12T13:30:45Z | Console   |
| CS215355_DUM       | dewdfen0163 | DEWDFGLD06259   | Active | -                    | RUNNING     | 2015-06-12T13:23:11Z | Console   |

Abbildung : Instanzenübersicht

# Neues Interface: B1 Cloud Portal

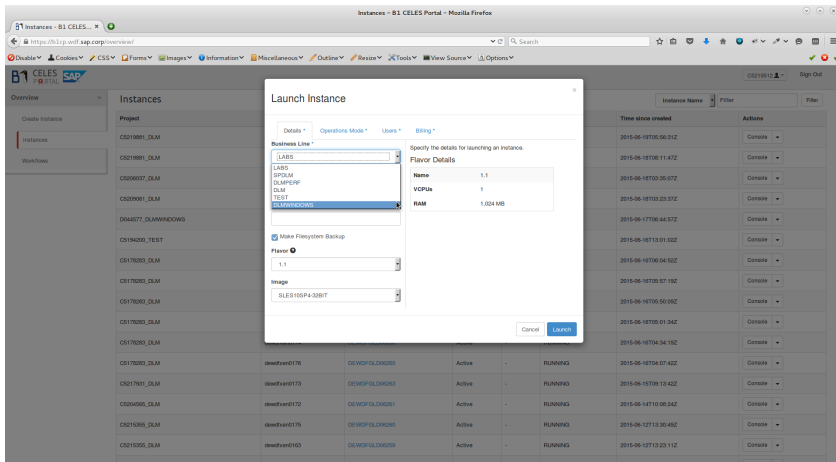


The screenshot shows the 'Instances' page in the B1 Cloud Portal. A modal dialog box titled 'Confirm Reboot Instance' is displayed in the center, with the message: 'You have selected "CELESTES100440". Please confirm your selection. This action cannot be undone.' The dialog has 'Reboot Instance' and 'Cancel' buttons.

| Project           | Instance Name | Status | Time since created   | Actions |
|-------------------|---------------|--------|----------------------|---------|
| CS217932_DJM      | dewd5an0174   | Active | 2015-06-19T00:16:40Z | Console |
| CS219891_DJM      | dewd5an0171   | Active | 2015-06-19T05:56:31Z | Console |
| CS219891_DJM      | dewd5an0174   | Active | 2015-06-19T06:11:47Z | Console |
| CS206037_DJM      | dewd5an0171   | Active | 2015-06-19T03:26:07Z | Console |
| CS200061_DJM      | dewd5an0173   | Active | 2015-06-19T03:29:37Z | Console |
| D044577_DJMWINDOW | dewd5an0171   | Active | 2015-06-17T06:44:57Z | Console |
| CS194030_TEST     | dewd5an0171   | Active | 2015-06-19T13:01:02Z | Console |
| CS178293_DJM      | dewd5an0171   | Active | 2015-06-19T06:04:52Z | Console |
| CS178293_DJM      | dewd5an0175   | Active | 2015-06-19T06:07:19Z | Console |
| CS178293_DJM      | dewd5an0163   | Active | 2015-06-19T06:00:09Z | Console |
| CS178293_DJM      | dewd5an0166   | Active | 2015-06-19T06:01:34Z | Console |
| CS178293_DJM      | dewd5an0174   | Active | 2015-06-19T04:24:19Z | Console |
| CS178293_DJM      | dewd5an0176   | Active | 2015-06-19T04:07:42Z | Console |
| CS217931_DJM      | dewd5an0173   | Active | 2015-06-15T09:12:42Z | Console |
| CS204969_DJM      | dewd5an0172   | Active | 2015-06-14T10:08:24Z | Console |
| CS210359_DJM      | dewd5an0175   | Active | 2015-06-12T13:30:49Z | Console |

Abbildung : Rebooten einer Instanz

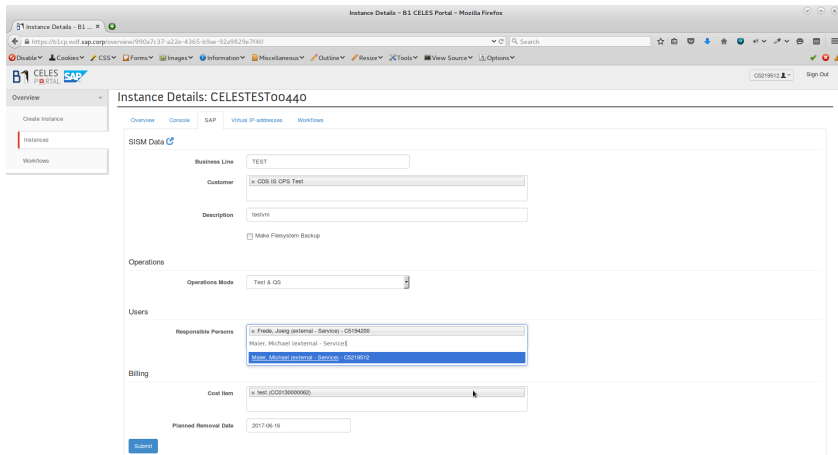
# Neues Interface: B1 Cloud Portal



The screenshot displays the 'Launch Instance' dialog in the B1 Cloud Portal. The dialog is titled 'Launch Instance' and has four tabs: 'Details', 'Operations Made', 'Users', and 'Billing'. The 'Details' tab is selected, showing a 'Business Line' dropdown menu with options: LABS, SPOLM, DLMP/EP, DLM, TEST, and DLMP/NCWS. Below this is a 'Make Filesystem Backup' checkbox, a 'Flavor' dropdown set to '1.1', and an 'Image' dropdown set to 'SLES15SP4-32BIT'. To the right of the dialog, a 'Flavor Details' box shows 'Name: 1.1', 'VCPU: 1', and 'RAM: 1,024 MB'. At the bottom right of the dialog are 'Cancel' and 'Launch' buttons. The background shows a table of instances with columns for Project, Instance Name, and Actions.

Abbildung : Launch Instance

# Neues Interface: B1 Cloud Portal



The screenshot displays the 'Instance Details: CELESTEST00440' page in a Mozilla Firefox browser. The page is divided into several sections:

- SISM Data:**
  - Business Line: TEST
  - Customer: ix.CDS IS OPS Test
  - Description: testvm
  - Make Filesystem Backup:
- Operations:**
  - Operations Mode: Text & OS
- Users:**
  - Responsible Persons:
    - ix.Fredrik.Joerg (external - Service) - CS194200
    - Mayer, Michael (external - Service)
    - Mayer, Michael (external - Service) - CS019612
- Billing:**
  - Cost Item: ix.test (COI-130000000)
  - Planned Removal Date: 2017-06-16

A 'Submit' button is located at the bottom left of the form area.

Abbildung : SISM-Integration über das Portal



# Neues Interface: B1 Cloud Portal

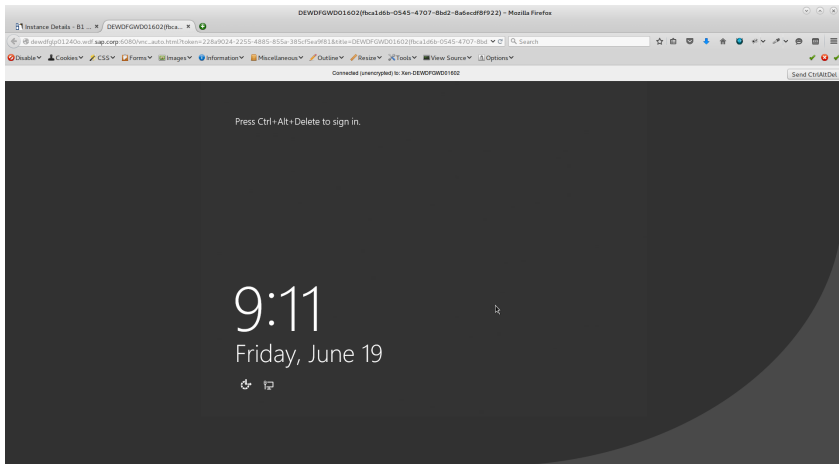


Abbildung : VNC-Zugriff auf die Instanzen über das Portal

# B1CP Architektur

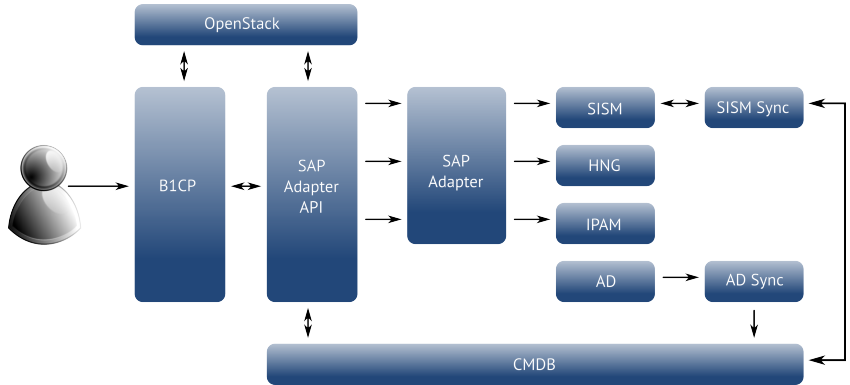


Abbildung : B1 Cloud Portal

# Dashboard 1/2

- sehr gute Skalierfähigkeit
- sehr schneller Zugriff auf alle verfügbaren Performedaten
  - Landschaftsauslastung
  - Server-Auslastung
  - VM-Auslastung
- grafische Darstellung von Performance werten
- Excel und CSV Export
- Usage Überblick über 30/60/180 Tage

# Dashboard 2/2

## Search Usage Info

Timeframe

RAM Average

CPU Average

30 Days 90 Days 180 Days

2014-07-30 - 2014-08-29

47.4527%

12.8499%

| Hostname      | RAM | RAM Free | RAM Max | RAM Avg | vCPUs | vCPU Max | vCPU Avg | Hypervisor   | Migration Zon |
|---------------|-----|----------|---------|---------|-------|----------|----------|--------------|---------------|
| DEWDFGLD02529 | 48  | 3        | 94%     | 94%     | 6     | 83%      | 8%       | DEWDFXEN0096 | 2             |
| DEWDFGLD02603 | 36  | 2        | 95%     | 94%     | 4     | 20%      | 9%       | DEWDFXEN0083 | 3             |
| DEWDFGLD03201 | 32  | 2        | 94%     | 94%     | 4     | 54%      | 14%      | DEWDFXEN0089 | 3             |
| DEWDFGLD04361 | 72  | 4        | 94%     | 93%     | 6     | 59%      | 42%      | DEWDFXEN0015 | 1             |
| DEWDFGLD04646 | 32  | 2        | 95%     | 93%     | 4     | 24%      | 8%       | DEWDFXEN0155 | 4             |
| DEWDFGLD02953 | 32  | 2        | 95%     | 93%     | 4     | 84%      | 15%      | DEWDFXENT006 | -             |
| DEWDFGLD01366 | 12  | 1        | 95%     | 92%     | 2     | 97%      | 52%      | DEWDFXEN0075 | 2             |
| DEWDFGLD02852 | 36  | 2        | 94%     | 91%     | 4     | 84%      | 16%      | DEWDFXEN0094 | 2             |
| DEWDFGLD02779 | 48  | 3        | 94%     | 91%     | 6     | 56%      | 23%      | DEWDFXEN0001 | 1             |
| DEWDFGLP0493  | 16  | 1        | 92%     | 91%     | 4     | 84%      | 14%      | DEWDFXEN0063 | 1             |
| DEWDFGLD01346 | 16  | 1        | 93%     | 91%     | 4     | 76%      | 13%      | DEWDFXEN0008 | 1             |
| DEWDFGLD02950 | 24  | 2        | 93%     | 91%     | 4     | 59%      | 7%       | DEWDFXEN0129 | 3             |
| DEWDFGLD02887 | 24  | 2        | 93%     | 91%     | 4     | 62%      | 13%      | DEWDFXEN0095 | 2             |
| DEWDFGLD02566 | 36  | 3        | 93%     | 91%     | 4     | 44%      | 14%      | DEWDFXEN0084 | 3             |
| DEWDFGLD01535 | 16  | 1        | 93%     | 91%     | 4     | 77%      | 13%      | DEWDFXEN0048 | 1             |

xls  csv
 Page 1 of 154 15
View 1 - 15 of 2,303

# Performance Graphing



# Ausblick

- VM Migration von Folsom auf Icehouse
- OpenStack Upgrade Icehouse → Juno → Kilo
- B1CP Integration der Performance und Smokeping Graphen
- AD Integration (mit Keystone APIv3 )

Vielen Dank für Ihre Aufmerksamkeit!

Bei weiteren Fragen wenden Sie sich bitte an [info@b1-systems.de](mailto:info@b1-systems.de)  
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