



The World of Clouds, Containers, and Complicated Images

It's a Kind of Magic ...

Joachim Werner
Senior Product Manager
joe@suse.com

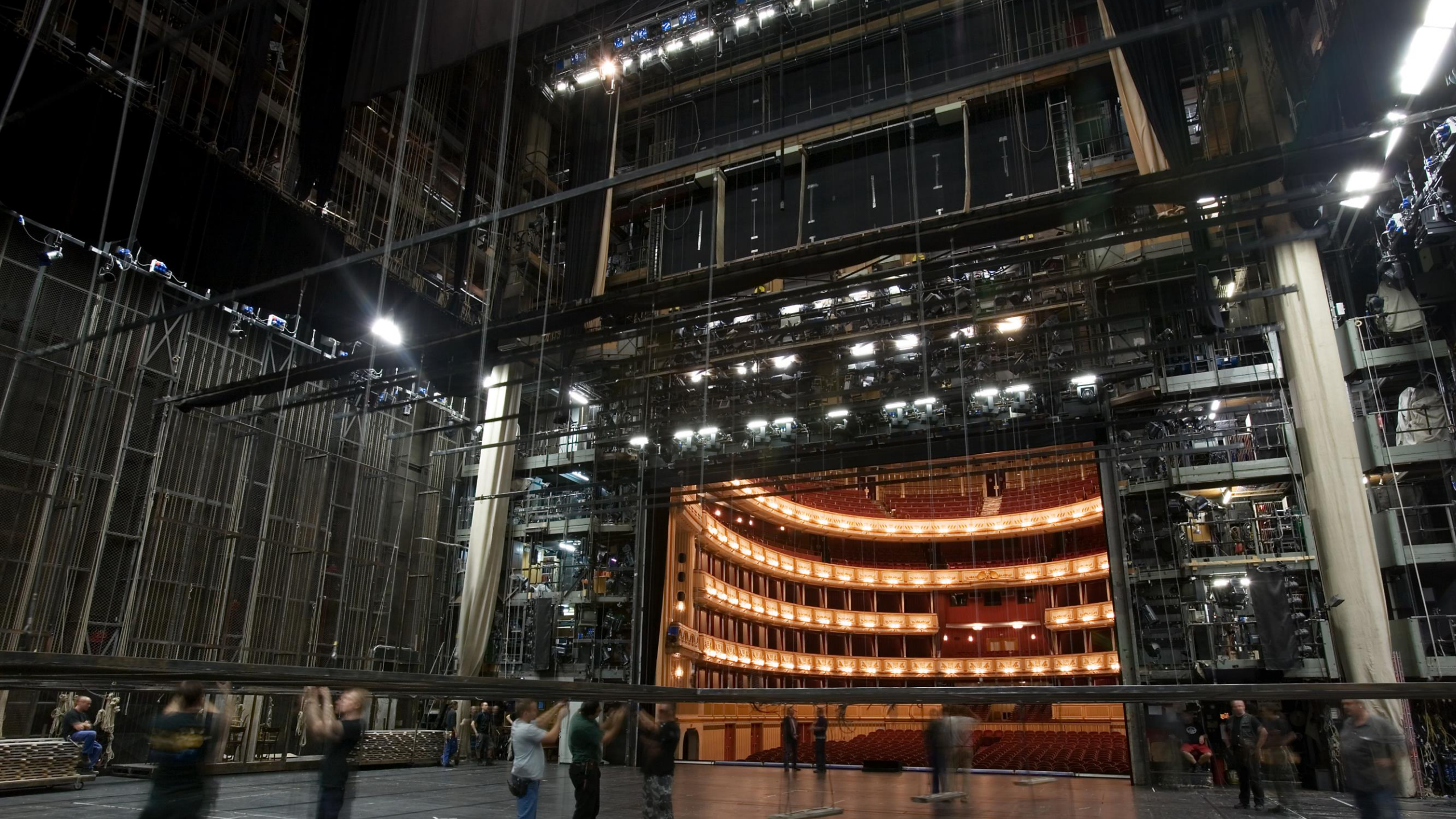


**Any sufficiently
advanced technology
is indistinguishable
from magic.**

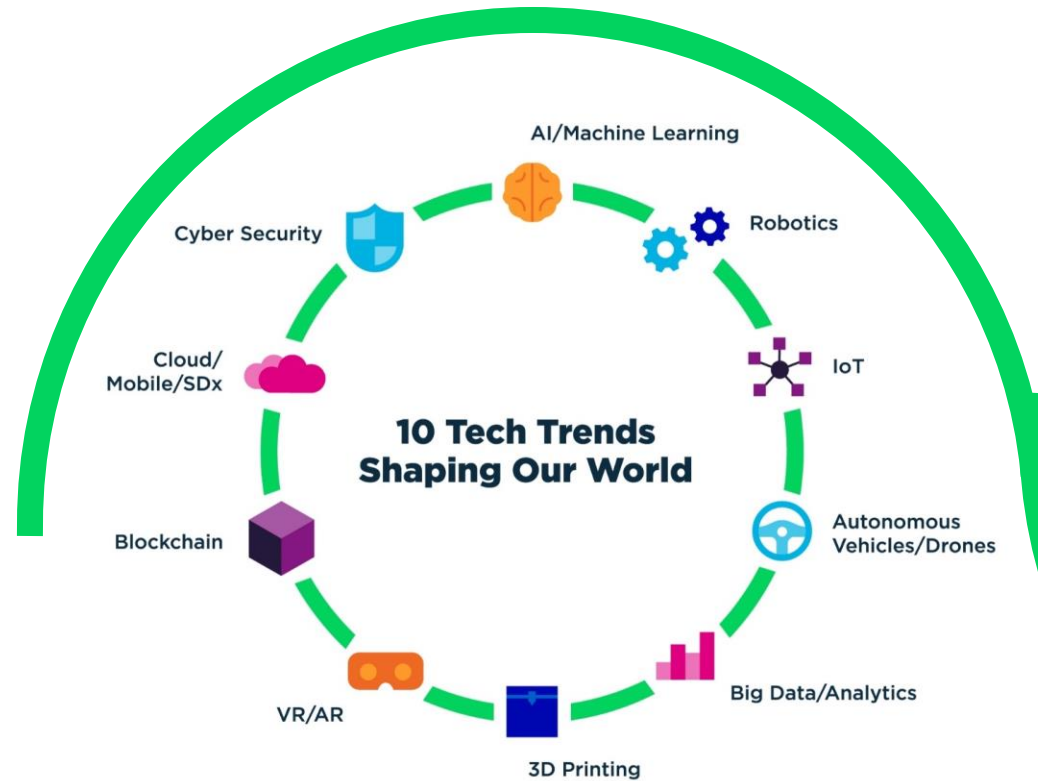


Arthur C. Clarke





Technology Trends Shaping the World



Increase Agility
Service Customers Better
Deliver New Offerings Faster
Drive Efficiency

IT Transformation is Required to Meet Changing Business Demands

IT Infrastructure



Datacenter



Hosted / Managed



Cloud

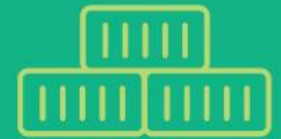
Application Deployment



Physical Servers



Virtual Servers



Containers

Application Architecture



Monolithic



N-Tier



Microservices

Development Process



Waterfall



Agile



DevOps

NEW DEMANDS



New Ways to Leverage Open Source

Open Source:

**Standing on the
shoulders of giants**

SUSE is Redefining What it Means to be Open



➔ Committed to open source

➔ Being a leader and contributor within the open source community

➔ Delivering technology and corporate openness, interoperability and flexibility for our customers/partners

The Open, Open Source Company

**We help you make
the magic happen**




SUSE®

LEQT



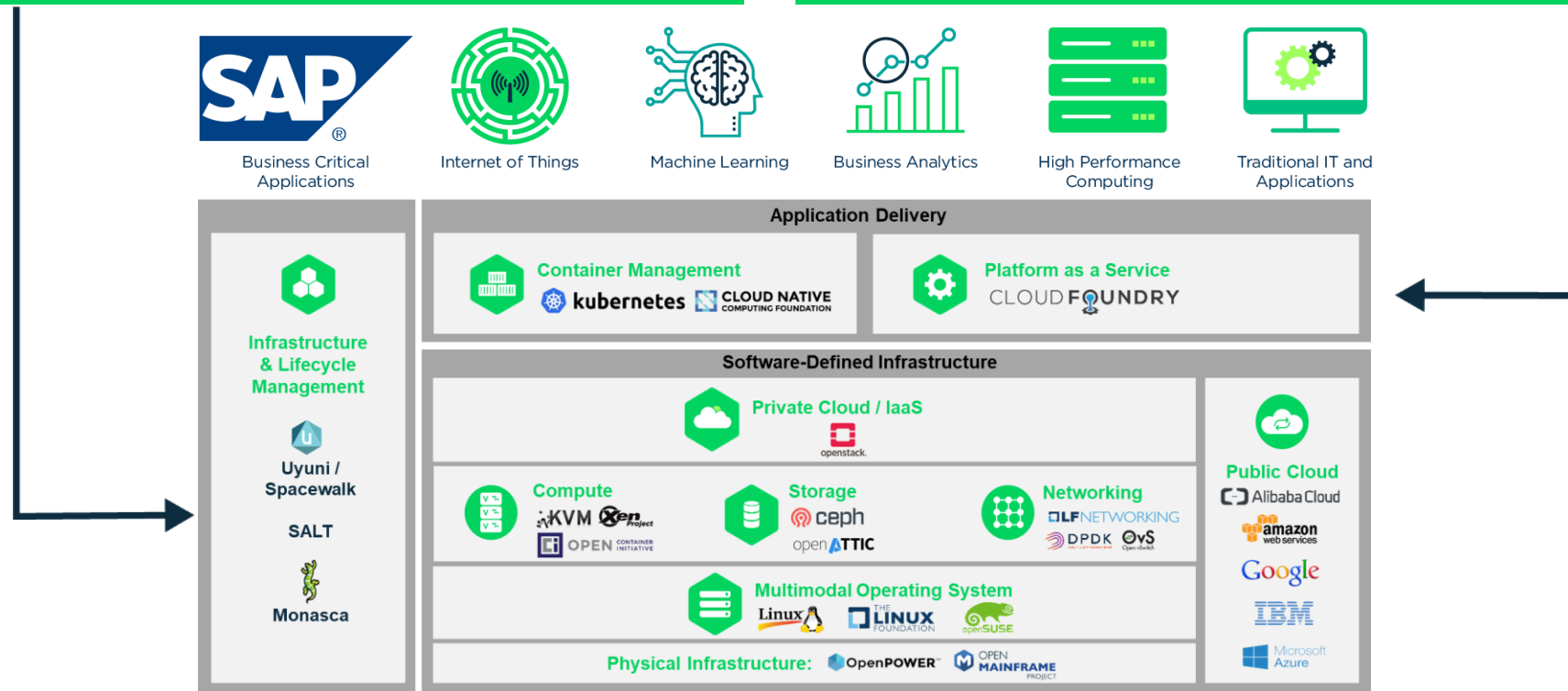
Open Source is Key for the Future IT Infrastructure

Software-defined Infrastructure

- Physical infrastructure abstraction
- Agile resource allocation and scalability
- Governed self-service

Modern Application Delivery Platform

- Container packaged
- Dynamically managed and scaled
- Micro-services oriented



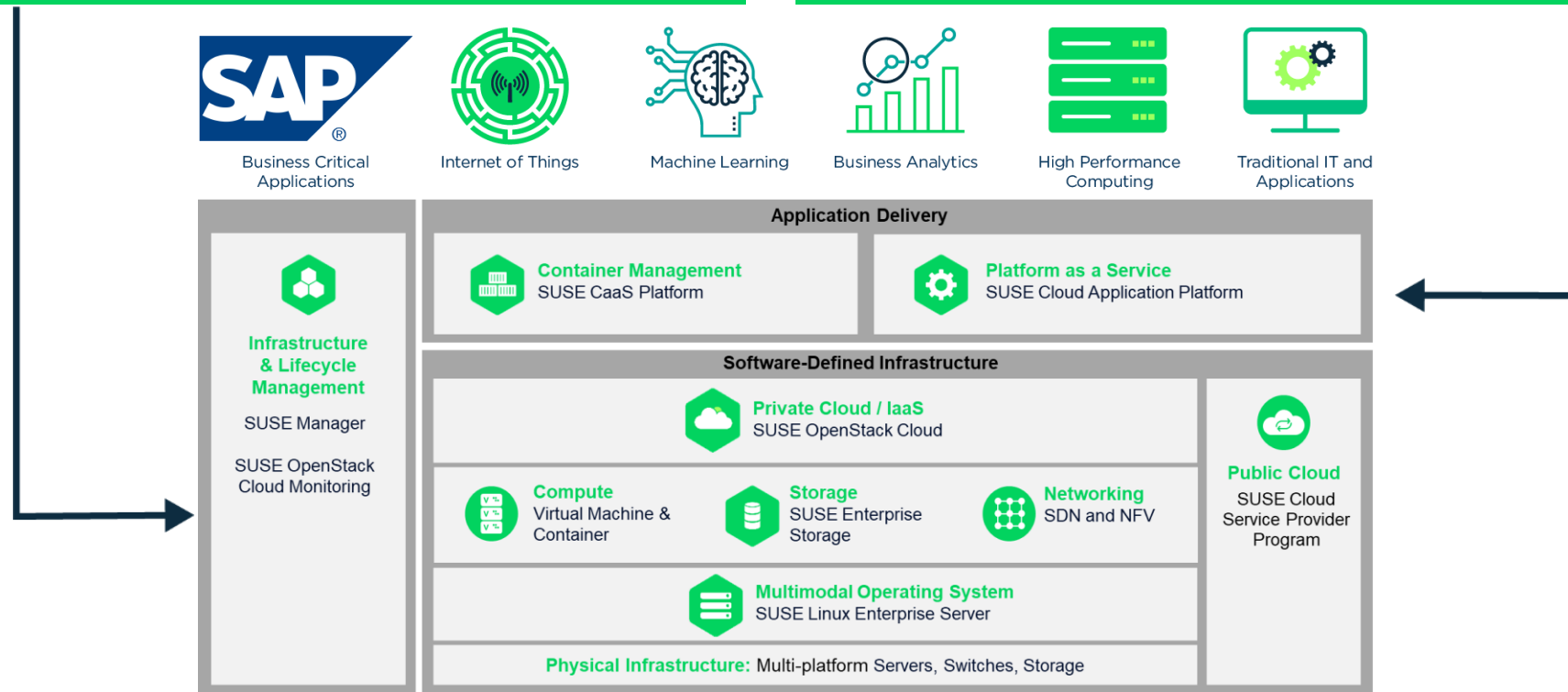
SUSE: Empowering Digital Transformation

Software-defined Infrastructure

- Consistent platform edge to core to cloud
- Enterprise resiliency and scale
- Deployment and life-cycle governance

Modern Application Delivery Platform

- Traditional to cloud native applications
- Choice of tools to fit business requirements
- Running on-premise or in the cloud



SUSE Software-Defined Infrastructure and Application Delivery Approach



Infrastructure & Lifecycle Management

SUSE Manager

SUSE OpenStack Cloud Monitoring

Application Delivery



Container Management
SUSE CaaS Platform



Platform as a Service
SUSE Cloud Application Platform

Software-Defined Infrastructure



Private Cloud / IaaS
SUSE OpenStack Cloud



Compute
Virtual Machine & Container



Storage
SUSE Enterprise Storage



Networking
SDN and NFV



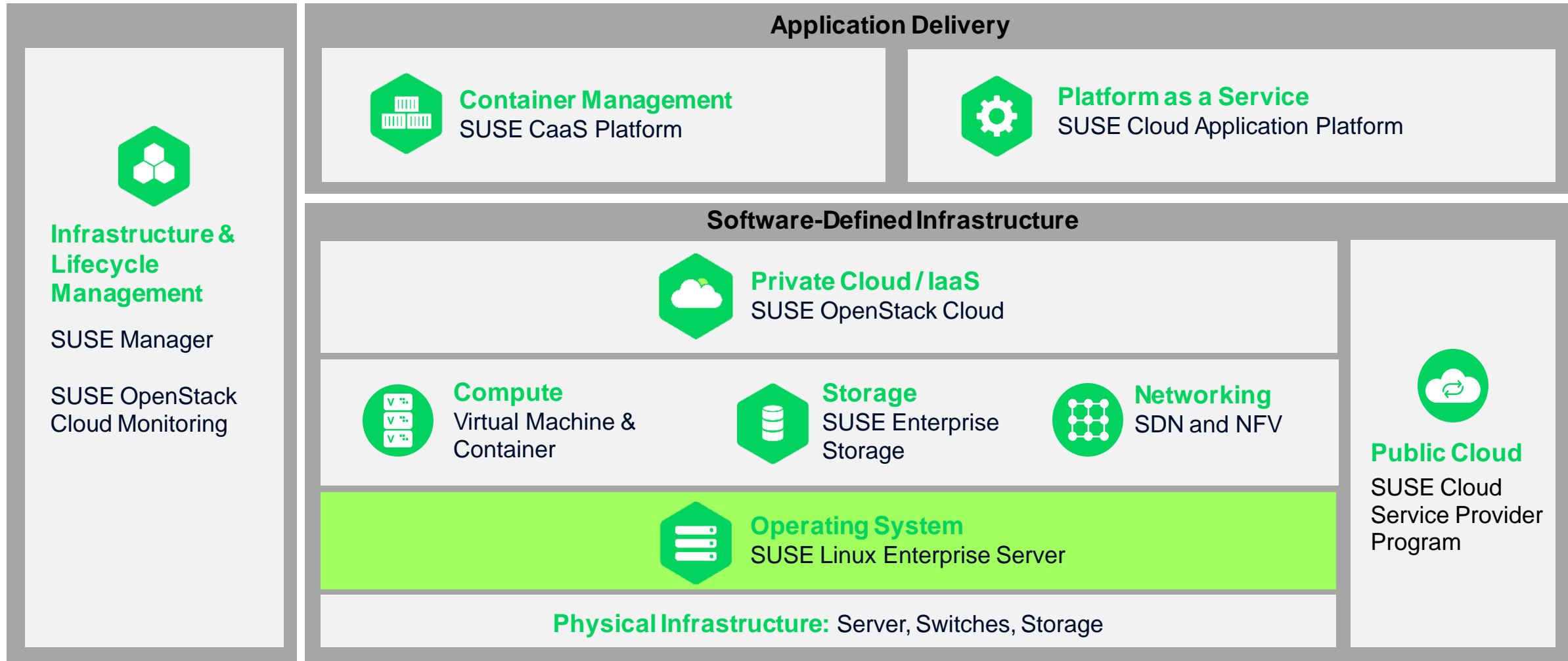
Operating System
SUSE Linux Enterprise Server

Physical Infrastructure: Server, Switches, Storage



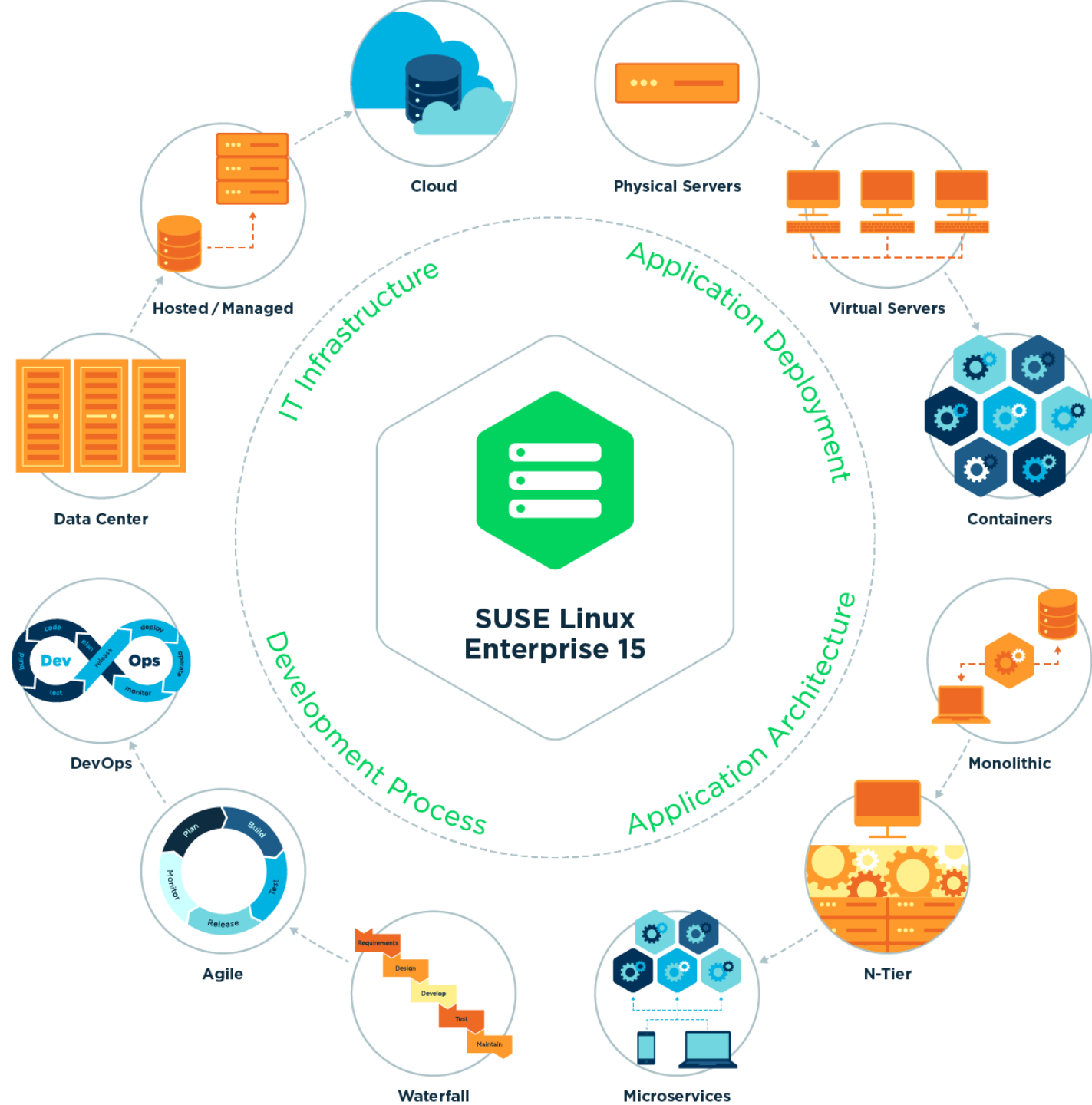
Public Cloud
SUSE Cloud Service Provider Program

SUSE Software-Defined Infrastructure and Application Delivery Approach



Multimodal IT

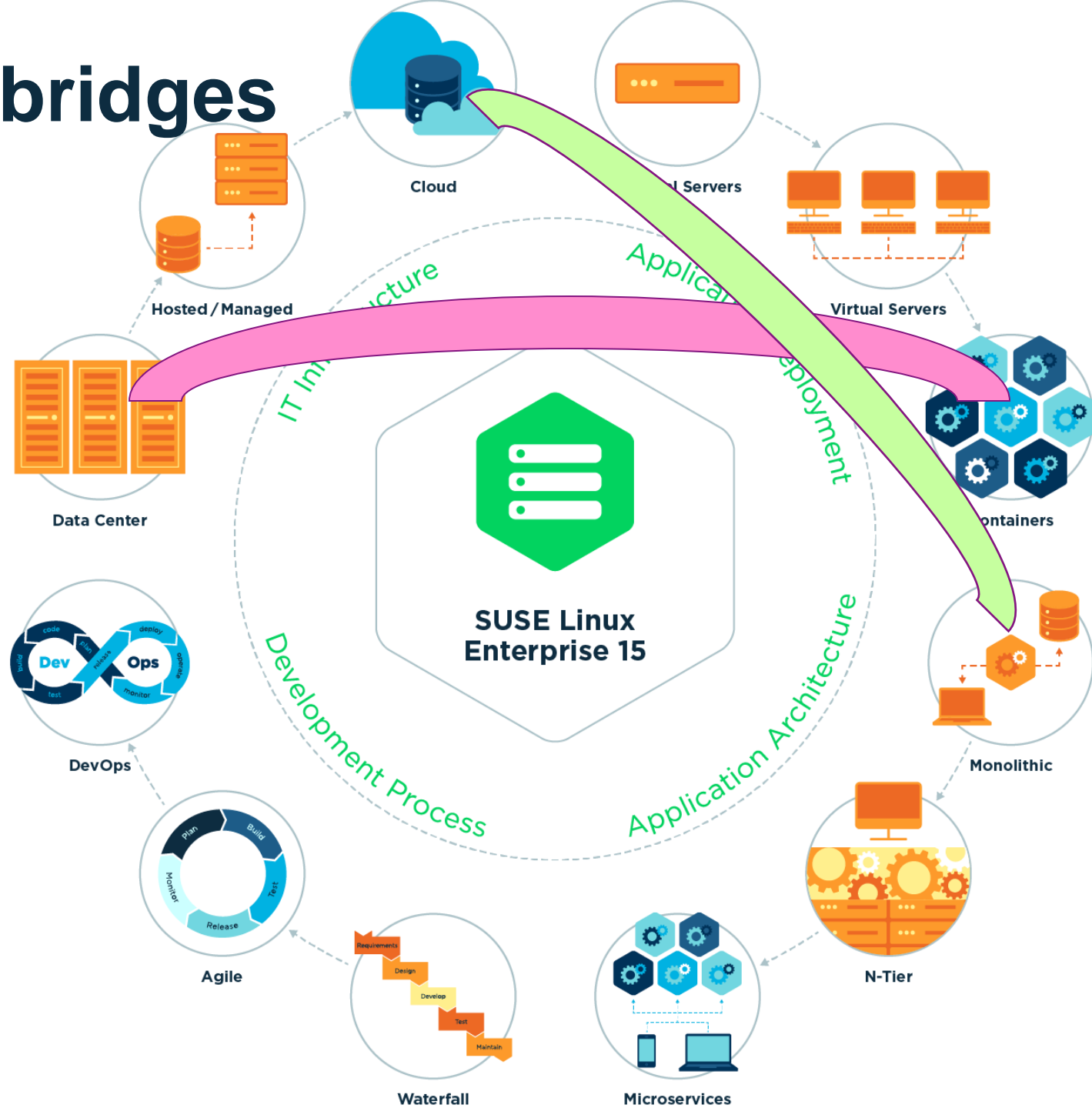
A co-existence of **traditional infrastructure**, **software-defined infrastructure** and application oriented architectures.



Multimodal IT needs bridges

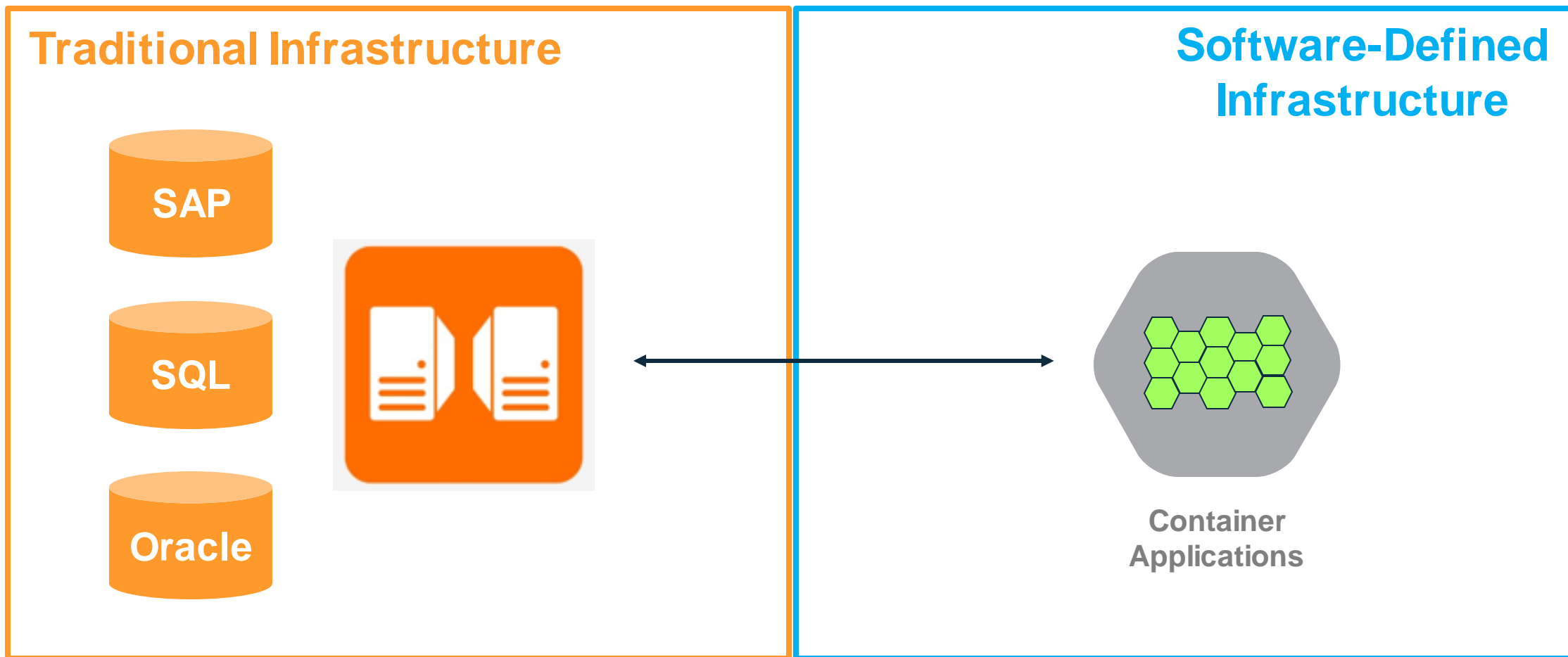
Move workloads from on-premise to cloud

Leverage data center for container applications



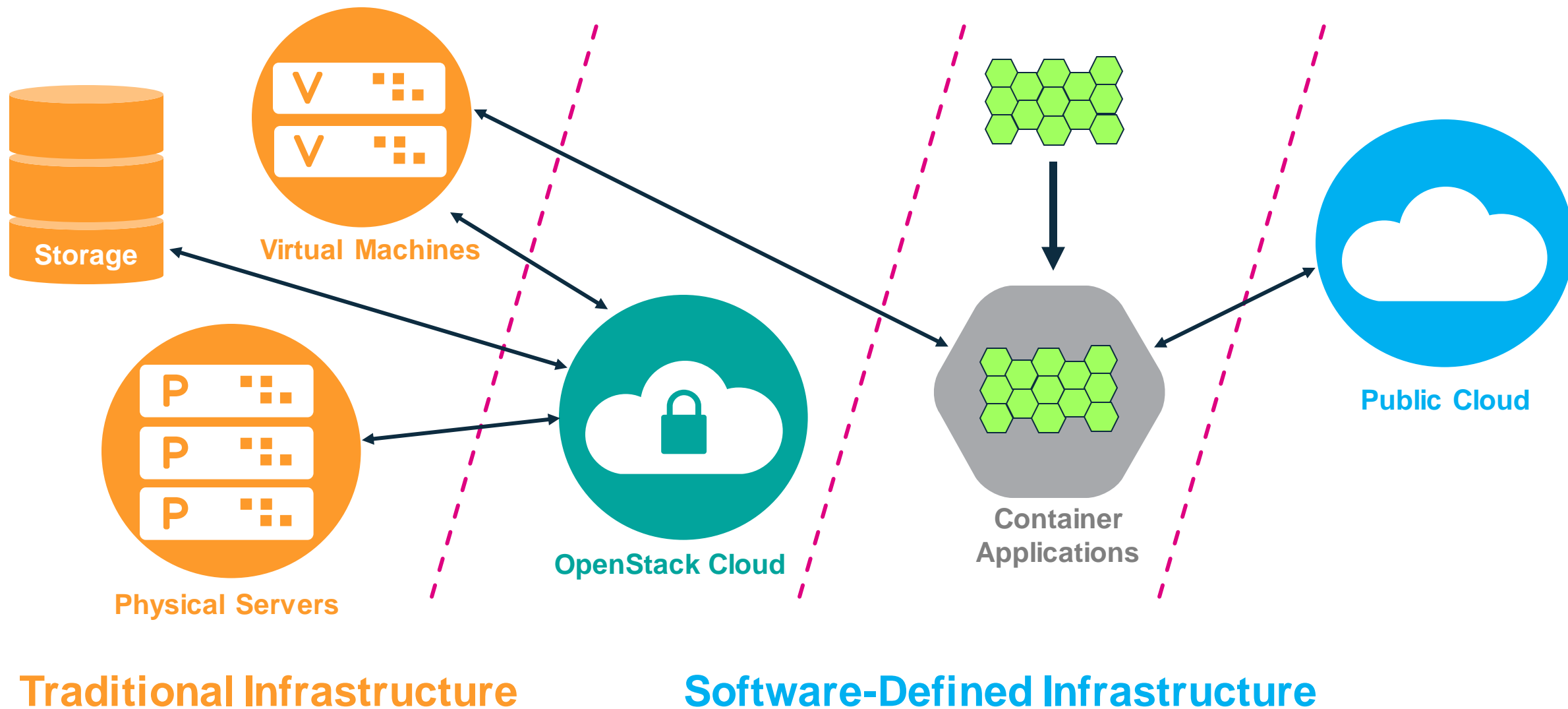
Multimodal IT – Mixed IT Infrastructure

Servers reside within traditional infrastructure and applications run on software-defined infrastructure



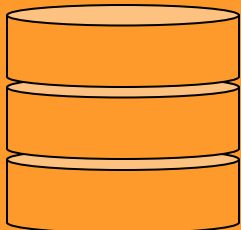
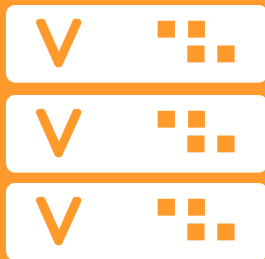
Multimodal IT – Mix of deployment scenarios

Variety of deployment scenarios co-exist spanning traditional and software-defined infrastructure



Building Bridges with **Multimodal OS**

**Traditional
Infrastructure**



**SUSE Linux
Enterprise 15**



**Software-
Defined
Infrastructure**



Developer friendly

Move to production faster from developer setups

Two options for a direct path to SUSE Linux Enterprise

Option 1

Community Linux
openSUSE Leap



SLE 15

Option 2

Free Developer
Subscription



SLE 15

Multimodal OS Requirements

Traditional Infrastructure

Multiple use cases

Manual and automatic installation

Variety of updates, upgrades, legacy

Variable packaging and installation

May become huge in size and
management

Software-defined Infrastructure

Single use case, multiple systems

Automatic and centralized installation

Always up-to-date

Fit one purpose

Small as possible for size and
management

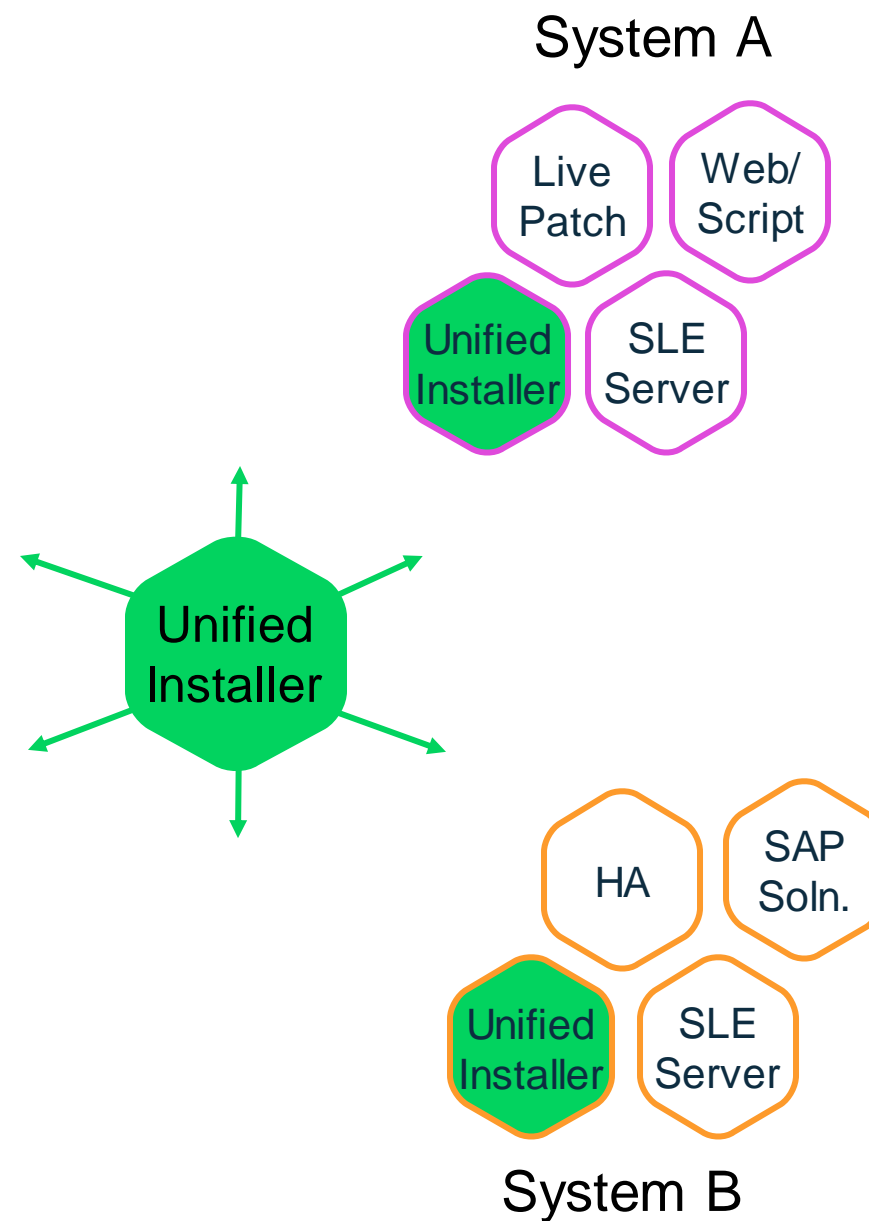
Unified Installer

Single starting point

The Unified Installer installs all SUSE Linux Enterprise 15 products from a single medium.

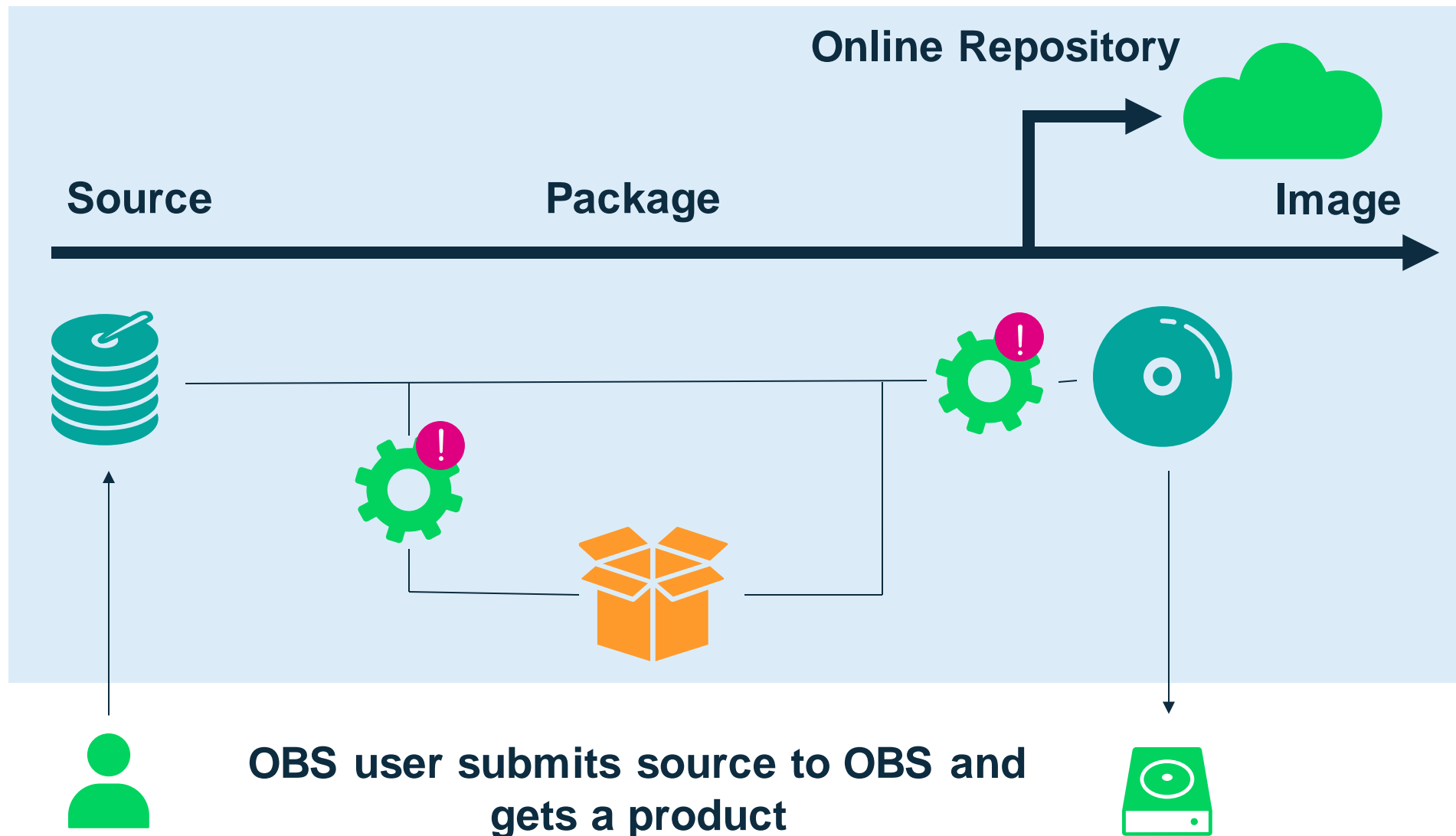
Easy to deploy

The Unified Installer medium is small.
It allows easier handling, remote use, and faster deployment cycle.



Open Build Service (OBS)
SUSE Package Hub
openSUSE Leap

What is Open Build Service (OBS)?



SUSE Package Hub

- Broadening software choices for enterprise users, save to install
- Community built and maintained
- SUSE-approved and built at no extra cost
- Public download and SCC integration

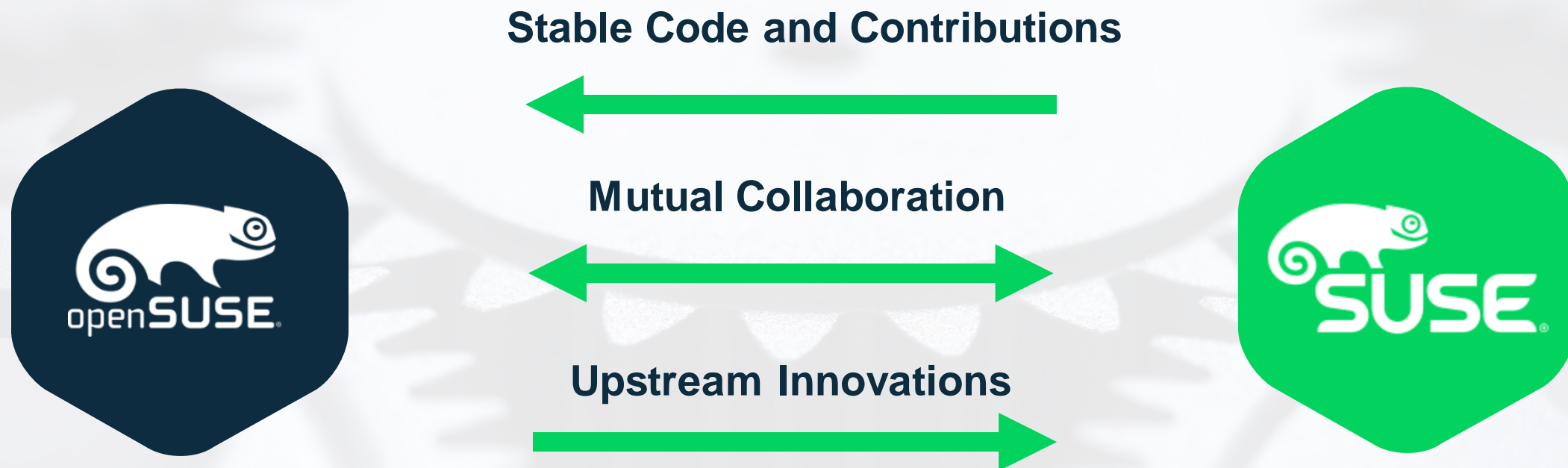


Upstream packages



packagehub.suse.com

SUSE & openSUSE – Working Together



The New openSUSE Distributions



Tumbleweed

openSUSE Tumbleweed

- Rolling Release
- Continuously Updated & Tested
- Perfect for Upstream Developers & Power Users



Leap

openSUSE Leap

- Regular release
- Shared core with SUSE Linux Enterprise
- Perfect for SysAdmins, Enterprise Developers and Users

SUSE Software-Defined Infrastructure and Application Delivery Approach



Infrastructure & Lifecycle Management

SUSE Manager

SUSE OpenStack Cloud Monitoring

Application Delivery



Container Management
SUSE CaaS Platform



Platform as a Service
SUSE Cloud Application Platform

Software-Defined Infrastructure



Private Cloud / IaaS
SUSE OpenStack Cloud



Compute
Virtual Machine & Container



Storage
SUSE Enterprise Storage



Networking
SDN and NFV

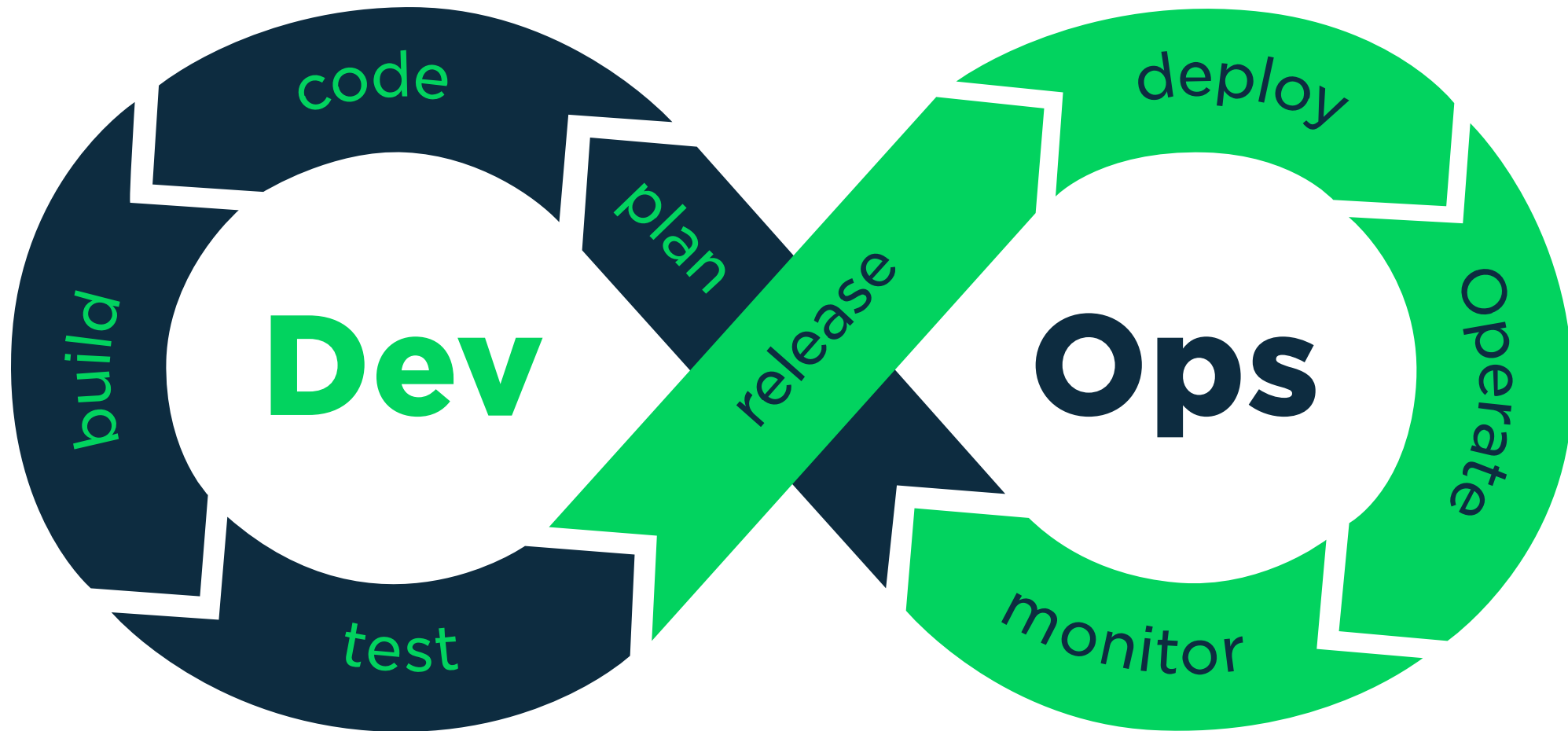


Operating System
SUSE Linux Enterprise Server

Physical Infrastructure: Server, Switches, Storage



Public Cloud
SUSE Cloud Service Provider Program



Application DevOps

Application Delivery

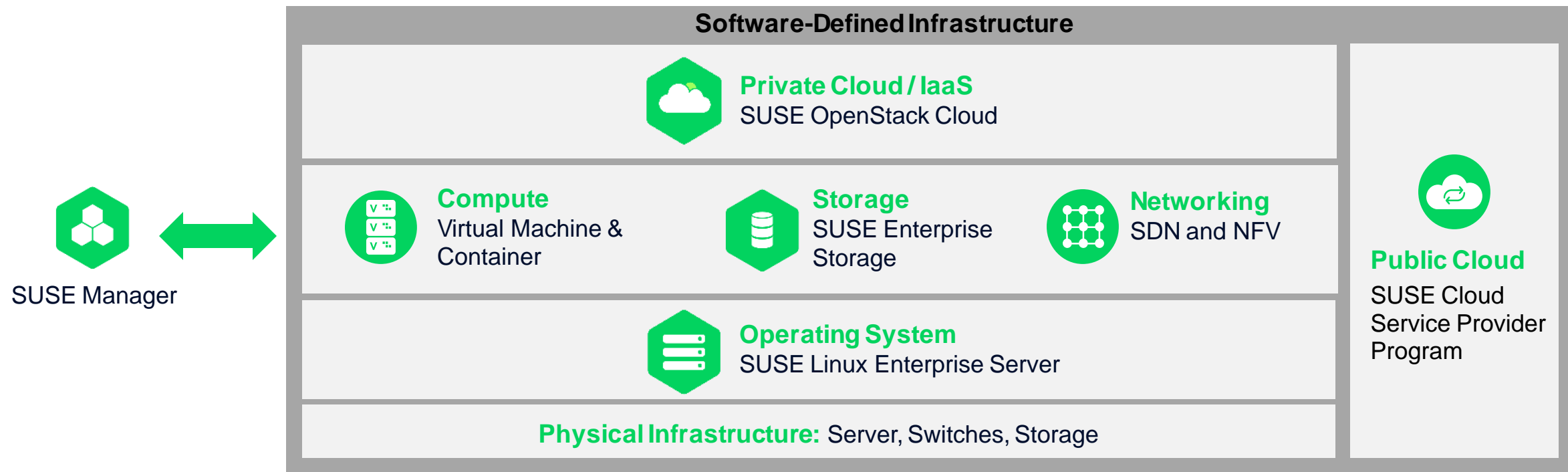


Container Management
SUSE CaaS Platform



Platform as a Service
SUSE Cloud Application Platform

Infrastructure Dev(Sec)Ops







Kubernetes is the container technology leader

Container orchestration and management

Orchestration

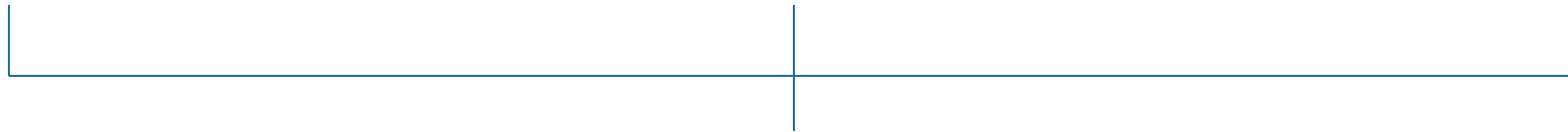
- Scheduling
- Service discovery

Performance and availability

- Scaling
- Load balancing
- Self-healing
- Monitoring

Maintenance

- Rollout
- Rollback



kubernetes



CLOUDFOUNDRY

SUSE Cloud Application Platform

*Bringing Advanced Cloud Foundry Productivity
to Modern Kubernetes Infrastructure*



kubernetes



CLOUD FOUNDRY

SUSE Application Delivery Platforms

Support multiple approaches to speed application delivery

Cloud Foundry

Productivity

Kubernetes

Flexibility

SUSE Cloud Application Platform

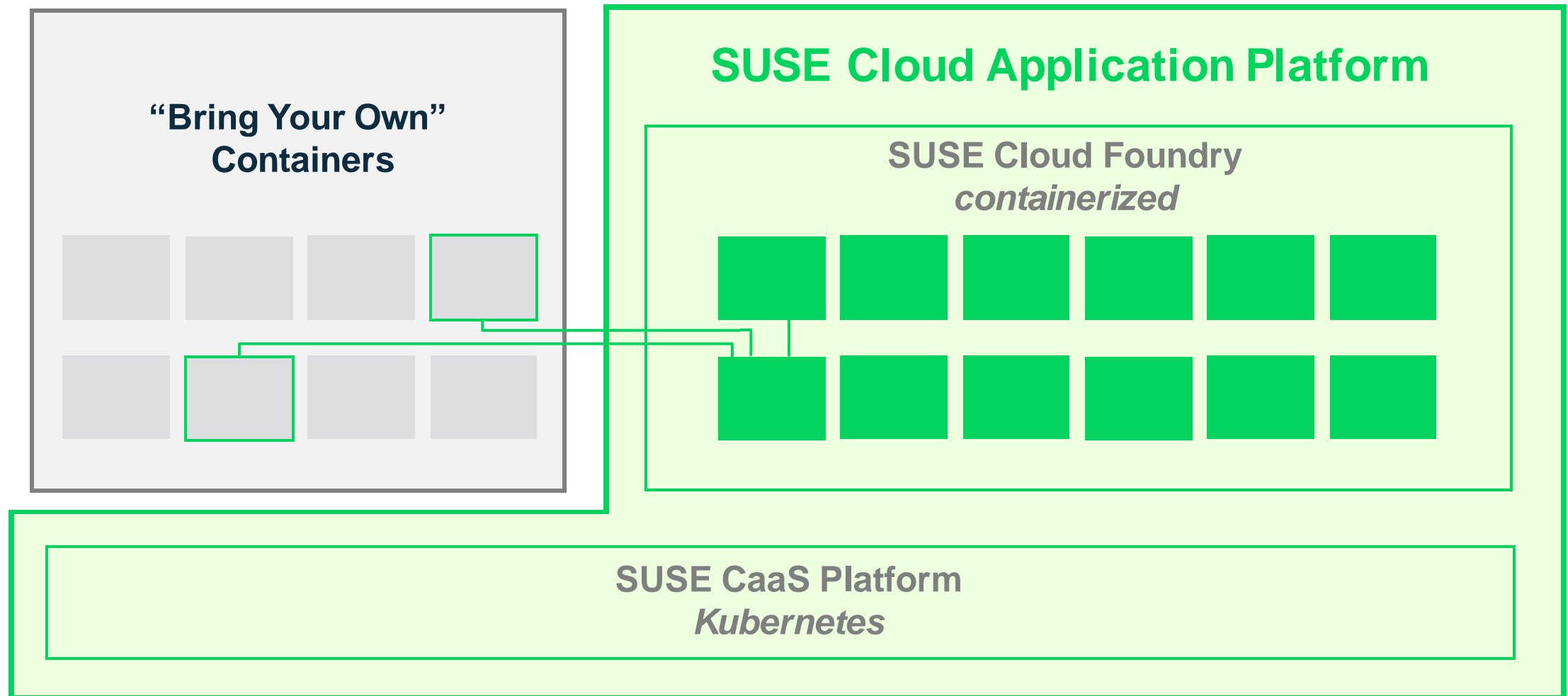
- Accelerate end-to-end application development and delivery at scale
- Maximize productivity with abstractions, patterns, and full lifecycle automation

SUSE CaaS Platform

- Simplify deployment and management of containers and containerized applications

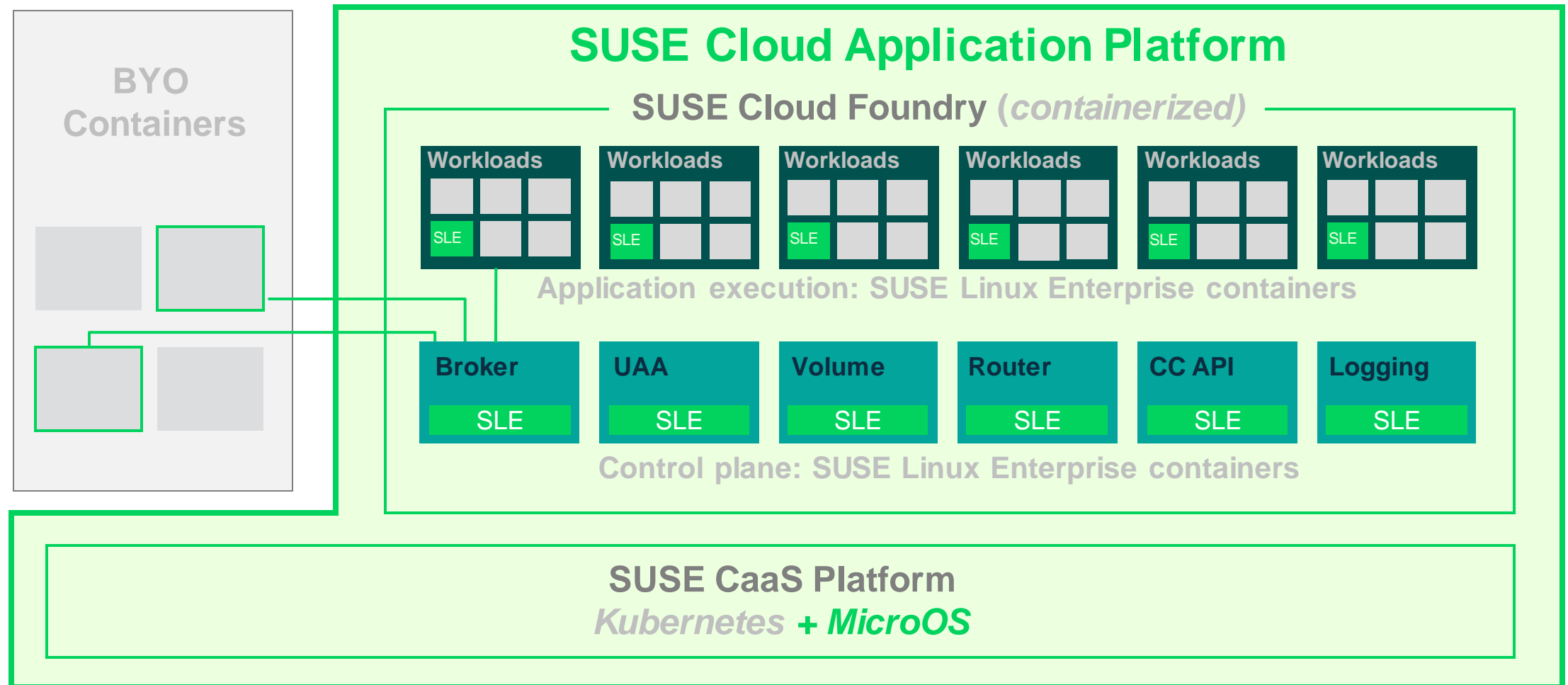
SUSE Cloud Application Platform

Manages containerized Cloud Foundry and other containers



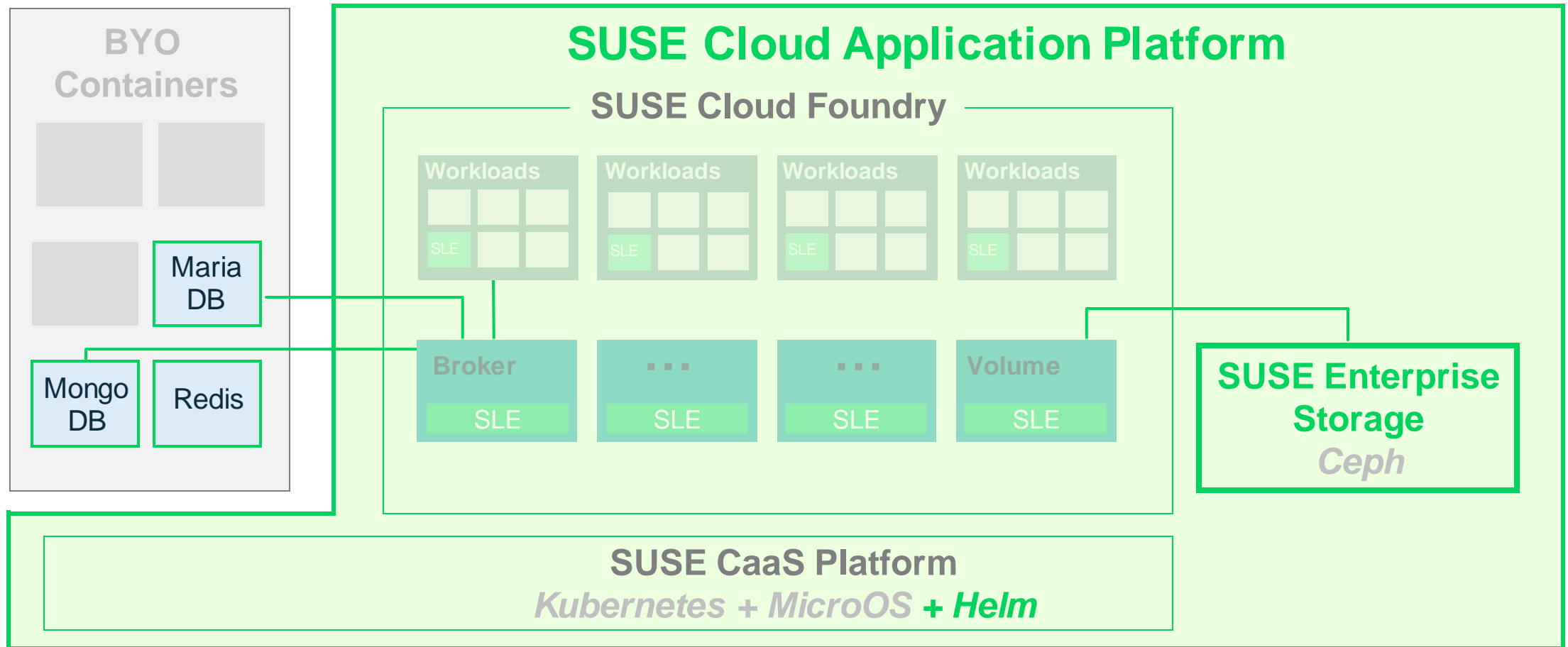
SUSE Cloud Application Platform

Built on SUSE Linux Enterprise



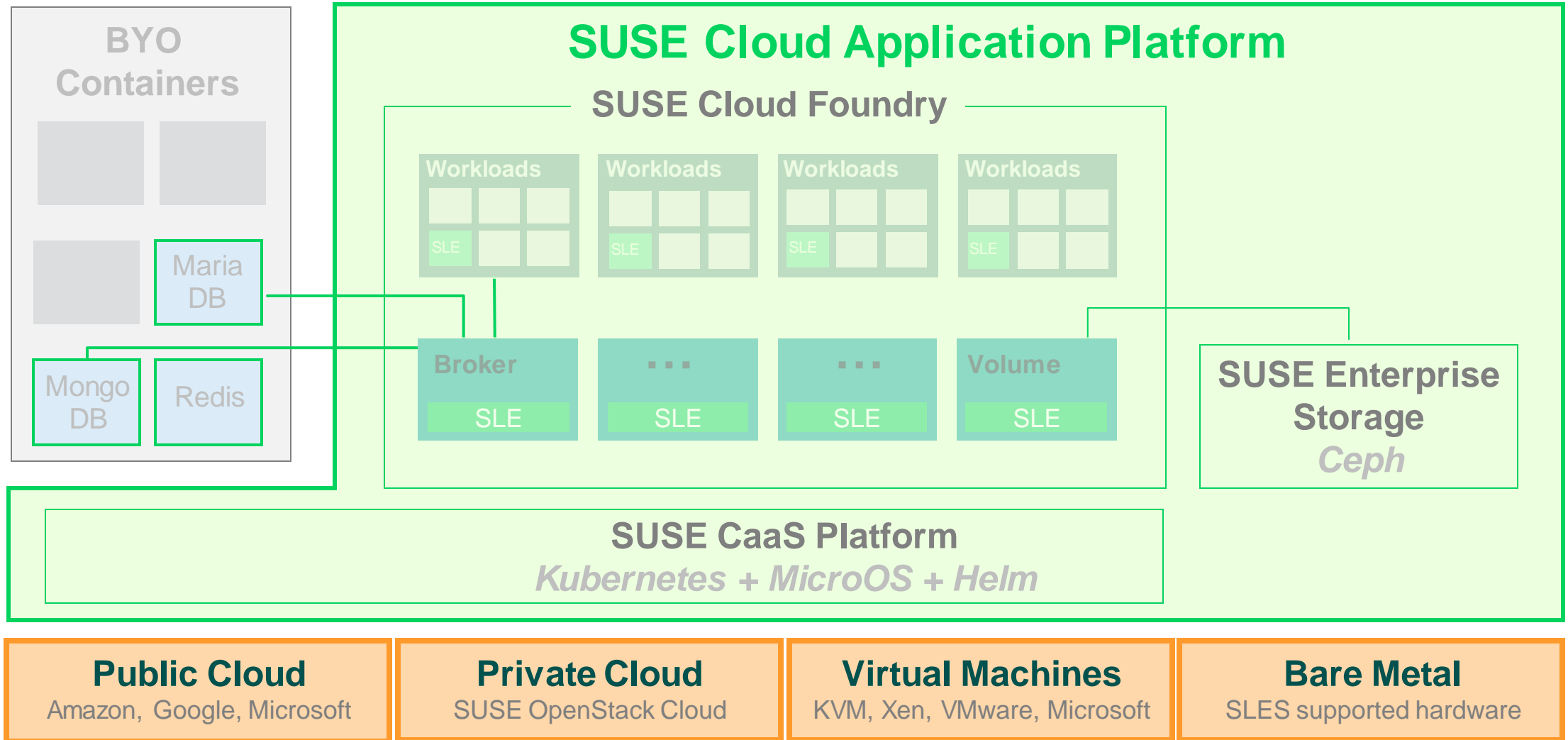
SUSE Cloud Application Platform

Integrated storage management and service brokers



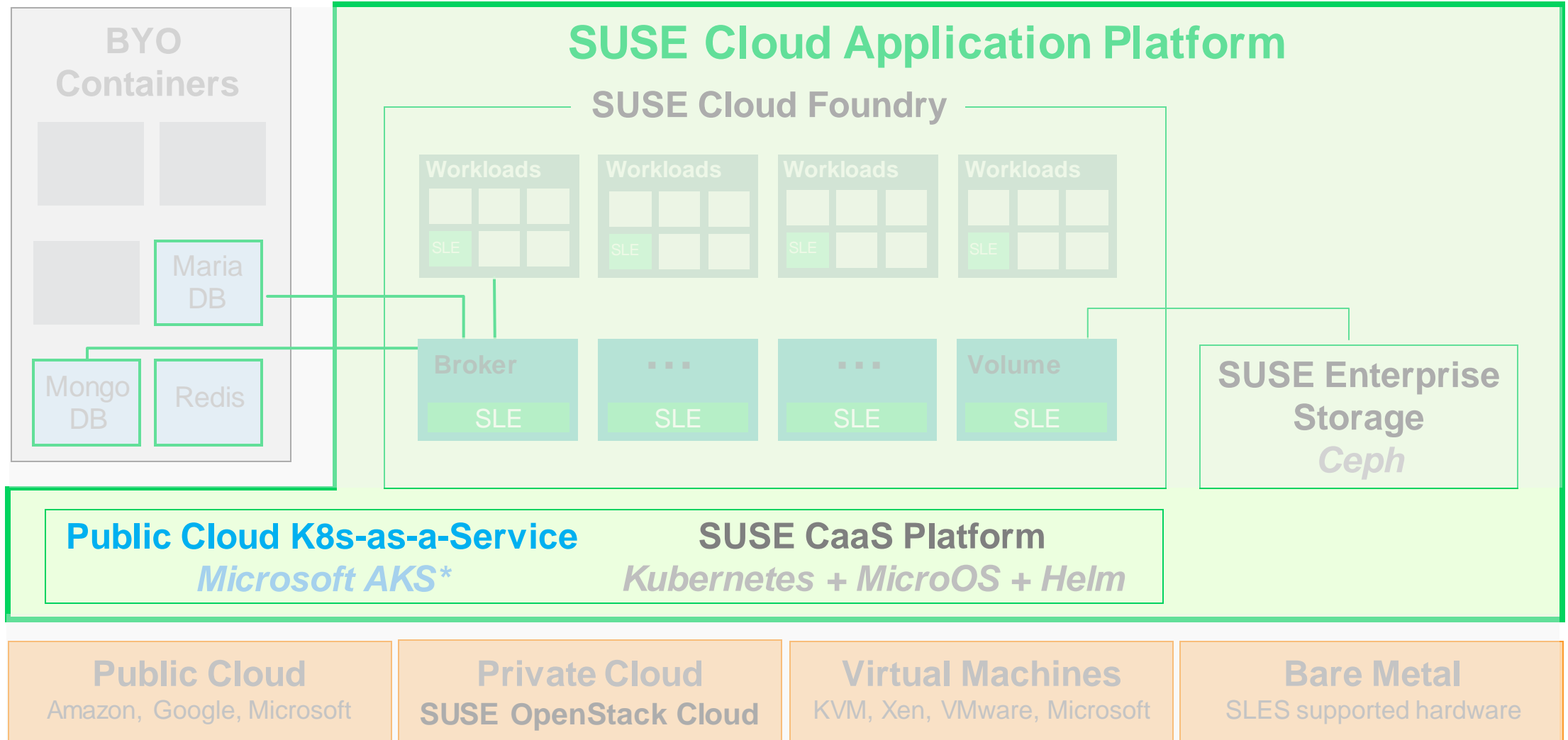
SUSE Cloud Application Platform

Easily deployed to public, private, and non-cloud infrastructure



SUSE Cloud Application Platform

New! Support for public cloud Kubernetes infrastructure



* Support for more cloud providers to follow

SUSE Cloud Application Platform


A modern and practical Cloud Foundry solution



- Easy for Kubernetes users
- Small memory footprint
- 100% open source
- Enterprise grade Linux

An ideal solution for organizations pursuing an engineering-led approach to application delivery transformation

Status

 Deployed - Online

Instances

3 / 3

Uptime

38d 1h 11m 52s







Average

38d 1h 11m 34s



Minimum

38d 1h 10m 59s


Application Info

 Memory Quota
16 MB Disk Quota
16 MB Created
Apr 17, 2018, 10:51:19 AM Modified
Apr 17, 2018, 4:24:46 PM Production
No App State
STARTED Package State
STAGED Services
1 Routes
0 SSH Enabled
Yes


Cloud Foundry

 Name
[SCF](#) Organization
[system](#) Space
[admin2](#)

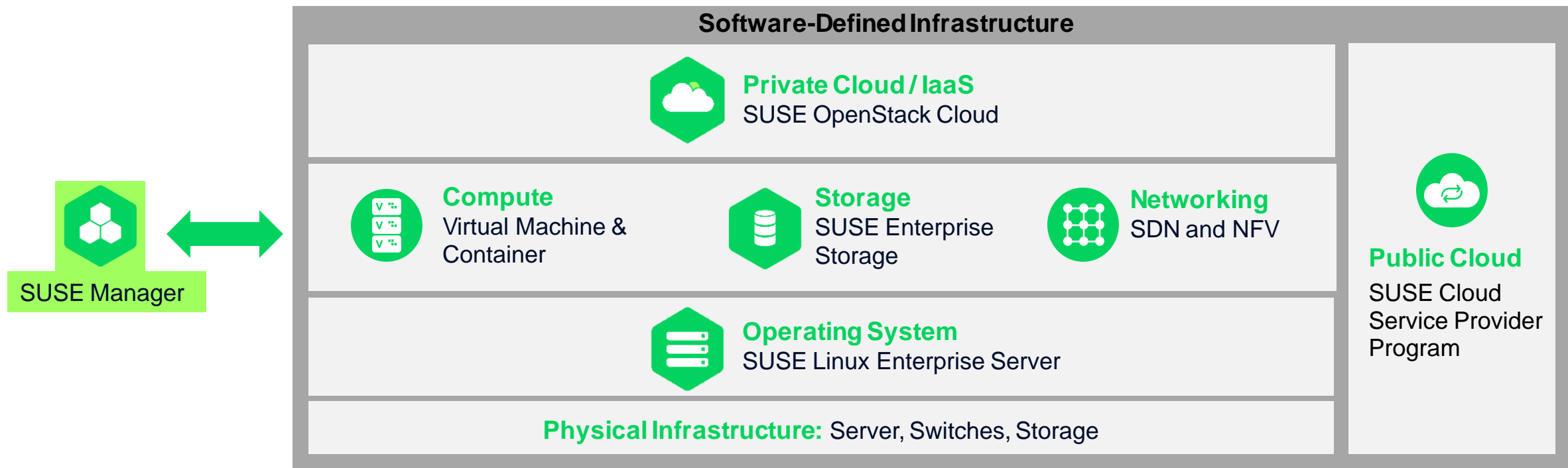
Build Info

 Buildpack
Go Stack
cflinuxfs2

Deployment Info

 GitHub
[ef3fb48c](#)

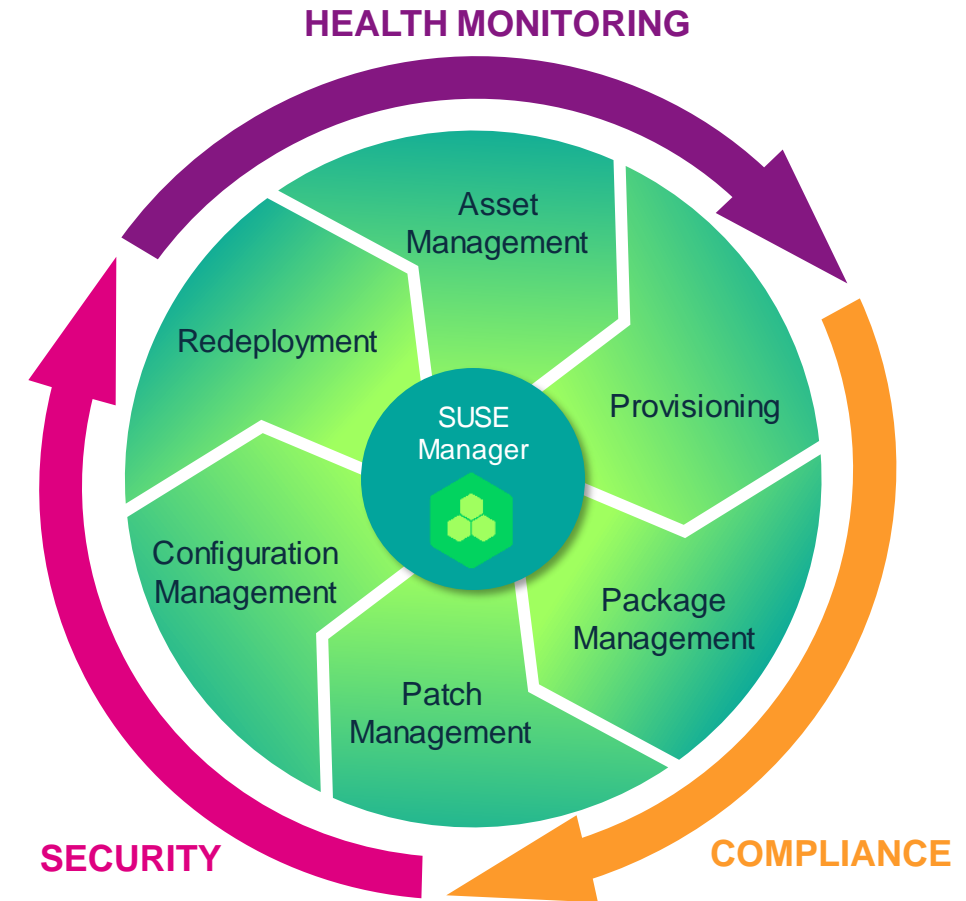
Infrastructure Dev(Sec)Ops





SUSE Manager

The Infrastructure Dev(Sec)Ops Tool

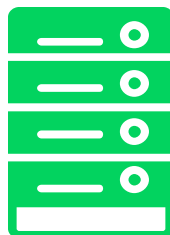
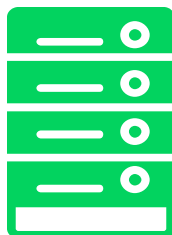


Security Updates “the traditional way”

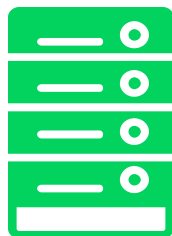
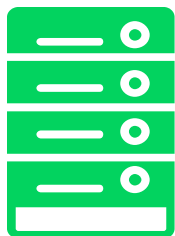
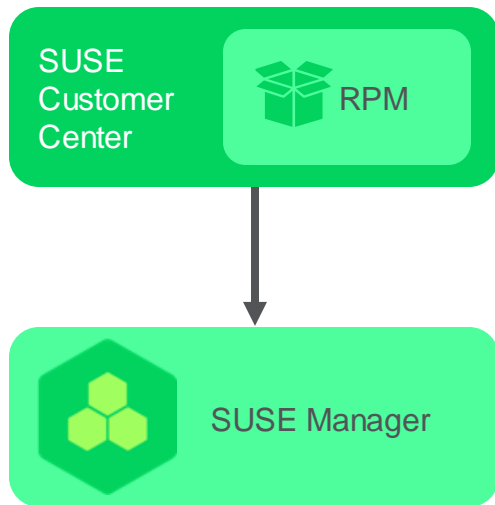
SUSE
Customer
Center



RPM



Security Updates “the traditional way”

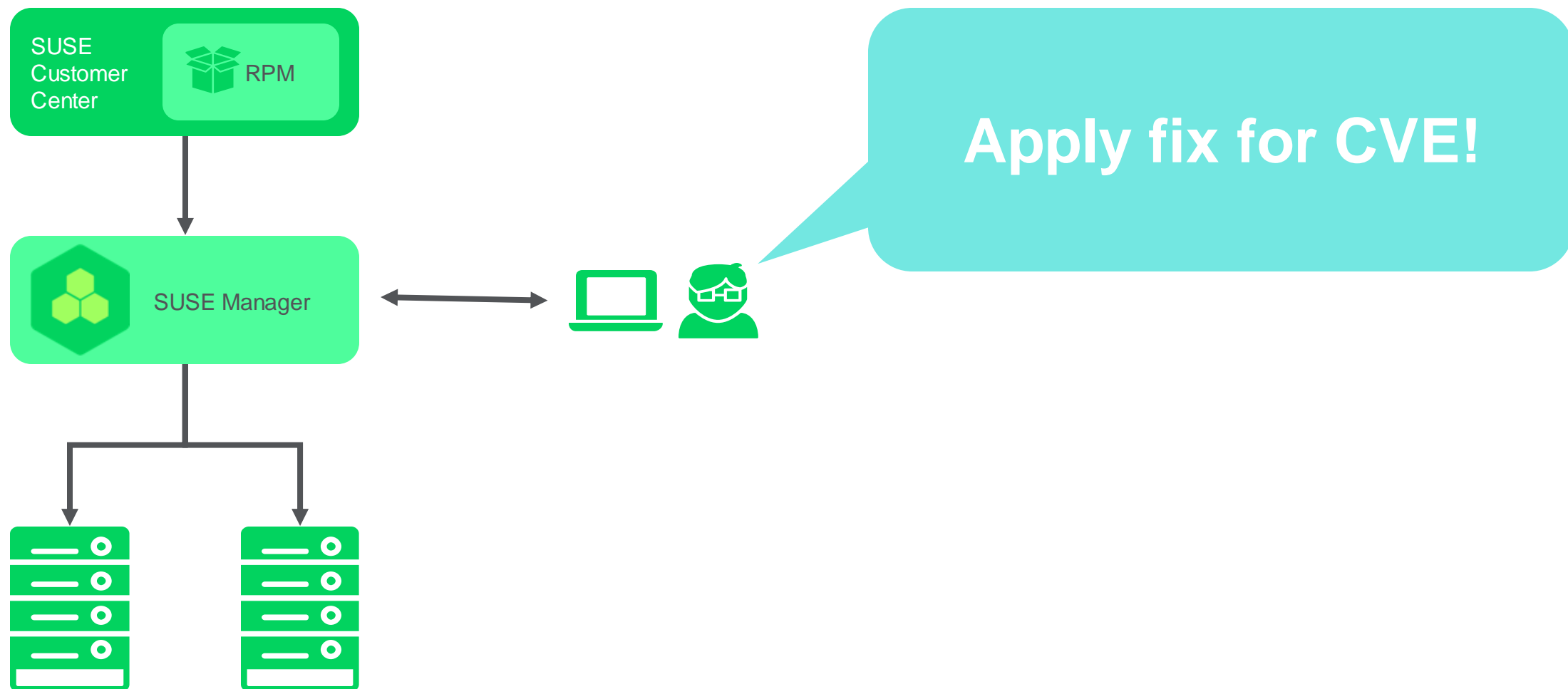


Ensure Compliance

With internal security policies and external regulations with automated monitoring, tracking, auditing and reporting

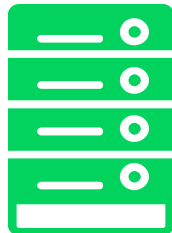
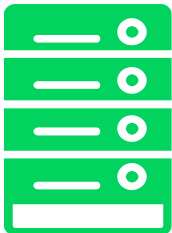


Security Updates “the traditional way”



How it often looks in “Container Land”

Public
Container
Registry



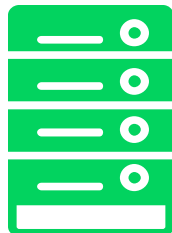
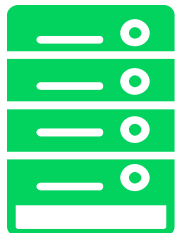
How it often looks in “Container Land”

Public
Container
Registry

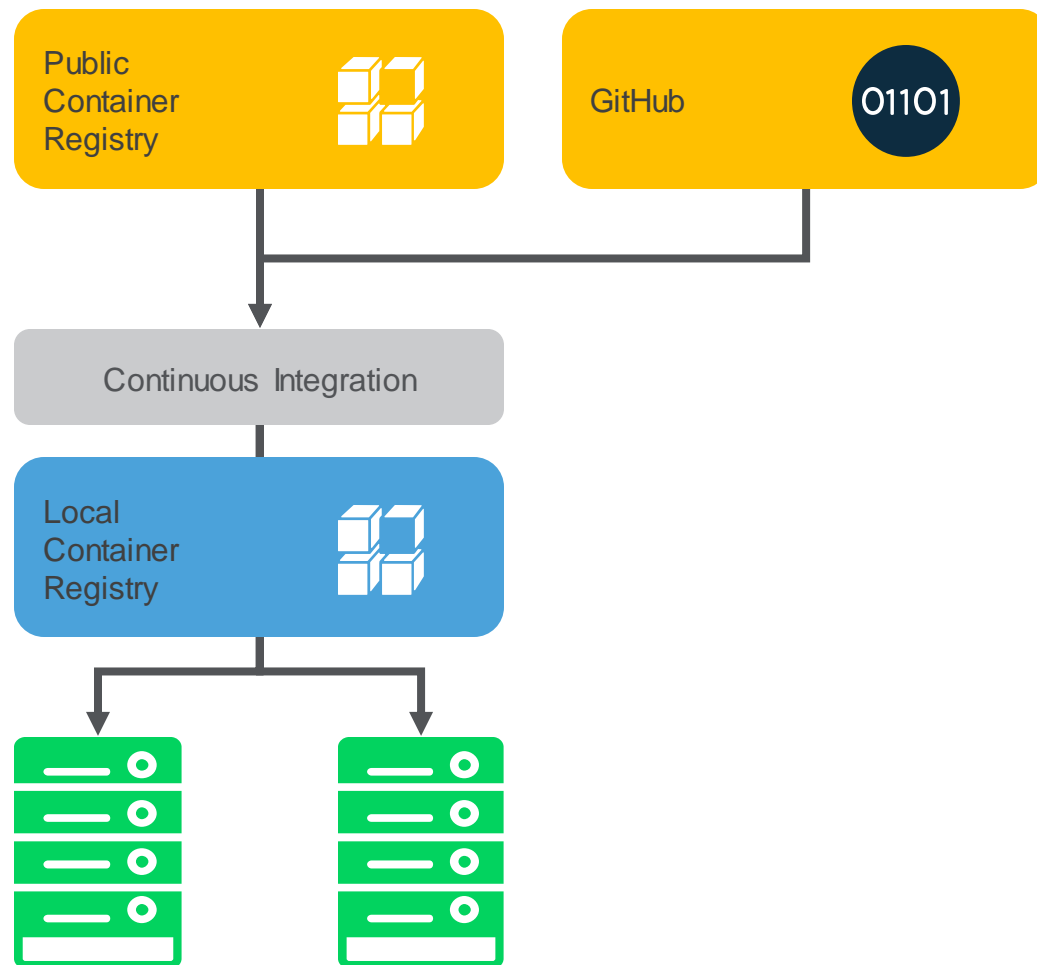


GitHub

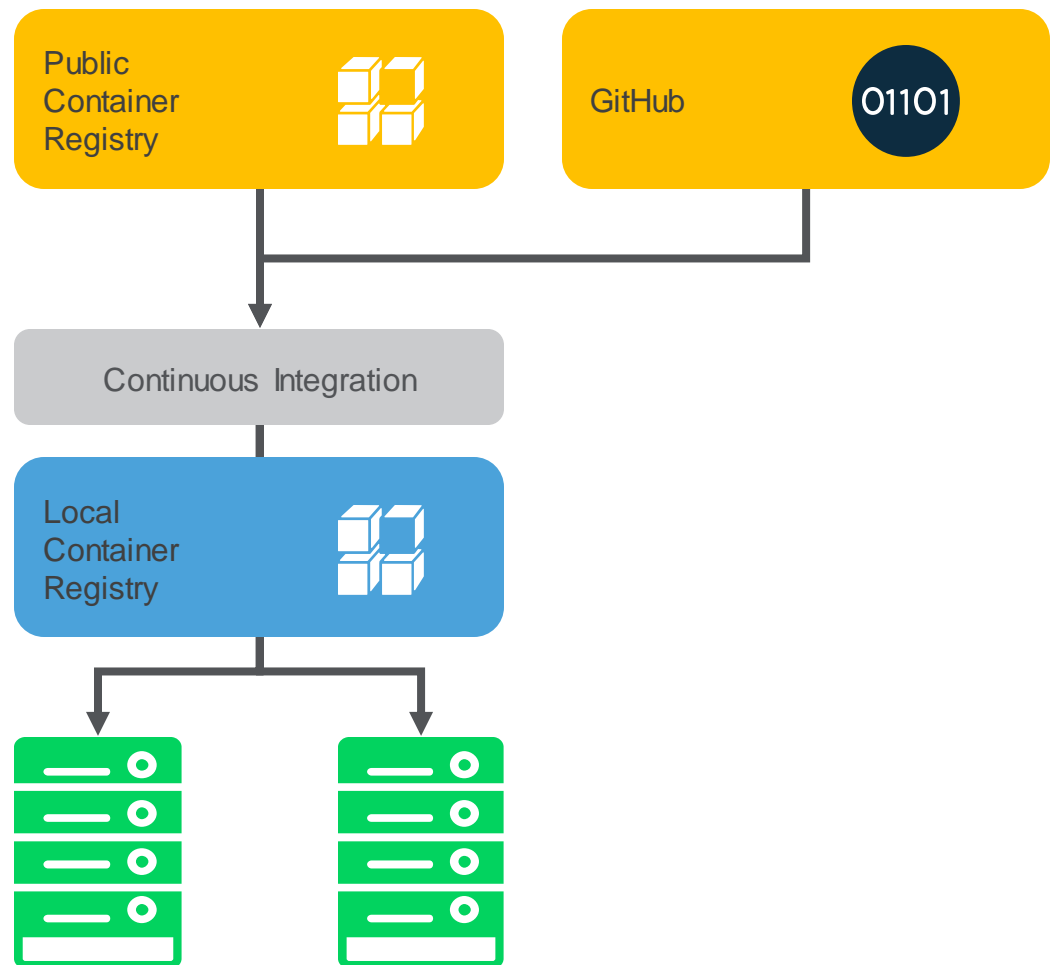
01101



How it often looks in “Container Land”



How it often looks in “Container Land”

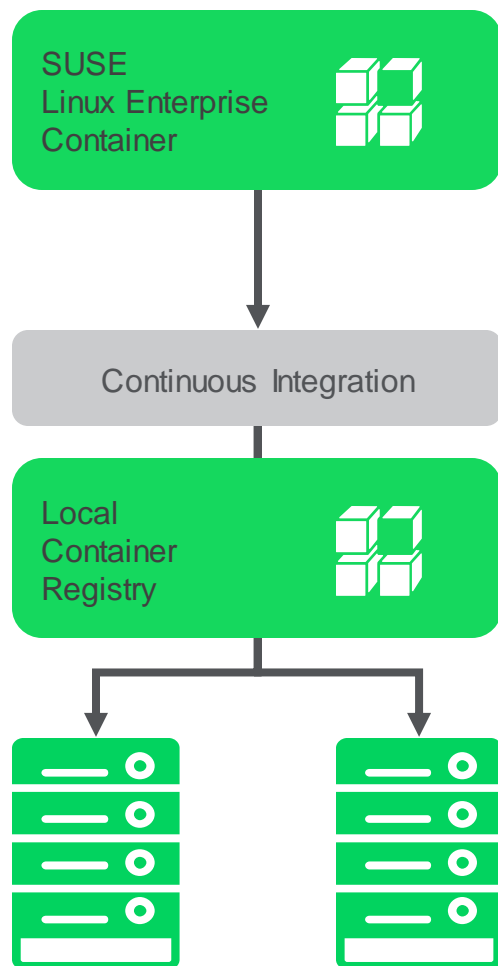


What's a CVE?

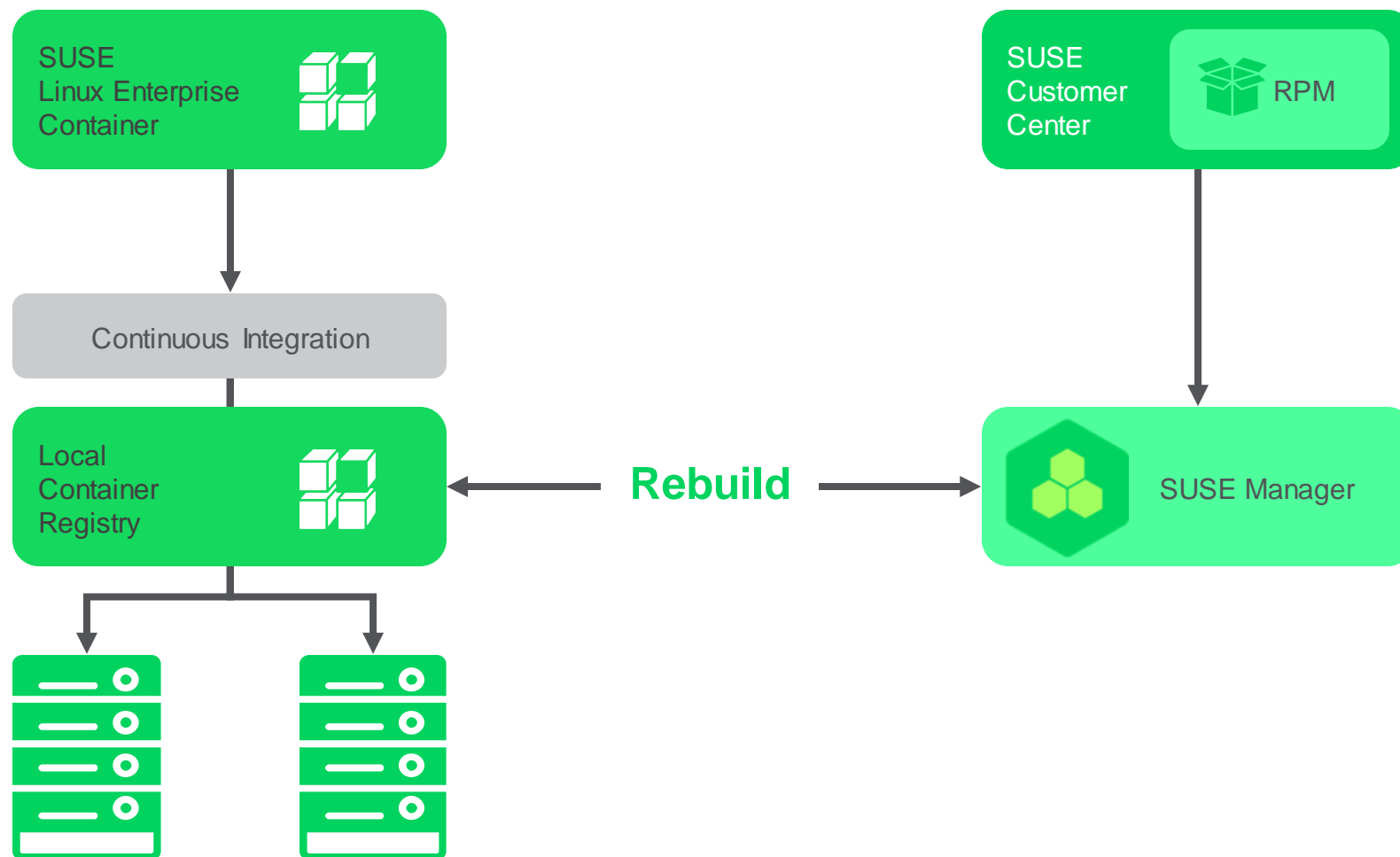


**Over 30% of all images on Docker Hub
contain high priority security vulnerabilities**

Secure Containers with SUSE Manager!



Secure Containers with SUSE Manager!



Activities

Google Chrome

SUSE Manager - Images

SUSE Manager - Salt

Not secure

https://sumars-head.mgr.suse.de/rhn/manager/cm/build?profile=4

SUSE Manager

Images > Build

2 systems selected

admin

SUSE Test

Clear Menu

Search page

Home

Systems

Salt

Images

Images

Build

Profiles

Stores

Patches

Channels

Audit

Build Image

Version:latest

Build Profile: suse_real_key

Build Host *: headref-minsles12sp2.tf.local

Schedule no sooner than

4/4/17

2:02 pm

CEST

Build

Profile Summary

Label	suse_real_key
Image Type	Dockerfile
Image Store	galaxy-registry
Path	https://gitlab.suse.de/galaxy/suse-manager-containers.git#test-donot-remove:test-profile/serverhost
Activation Key	1-MINION-TEST
Software Channels	test-channel-x86_64

Edit

Activities

Google Chrome

SUSE Manager - Imac

SUSE Manager - Salt

Not secure

https://sumars-head.mgr.suse.de/rhn/manager/cm/images

SUSE Manager > Images > Images

2 systems selected

admin

SUSE Test

Clear Menu

Search page

Home

Systems

Salt

Images

Images

Build

Profiles

Stores

Patches

Channels

Audit

Configuration

Schedule

Users

Images

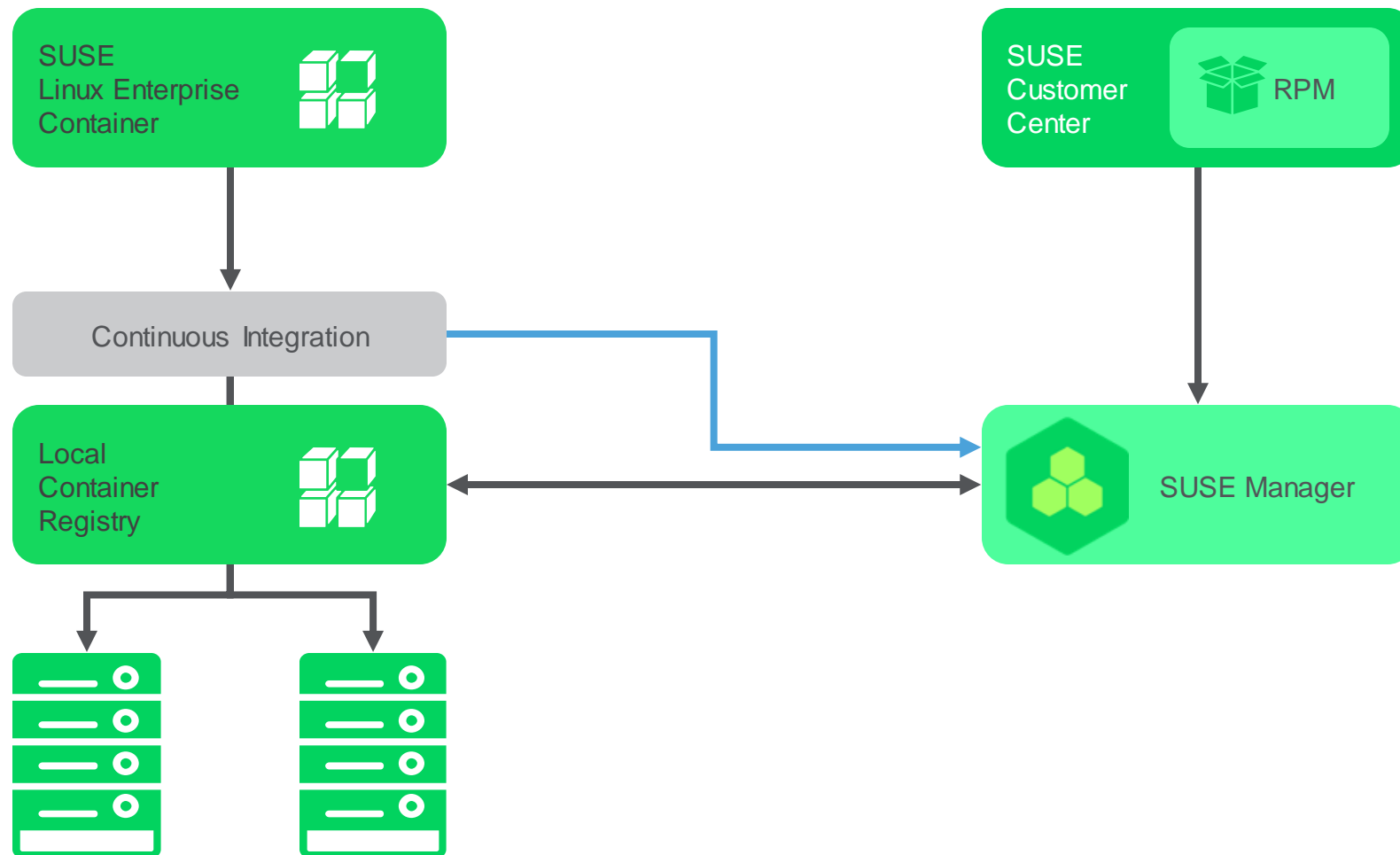
Refresh

Items 1 - 25 of 36

25 items per page

Name	Version	Updates	Patches	Packages	Status	Last Modified	Actions
suse_real_key	fac		2	2		21 minutes ago	
suse_simply	latest		0	0		2 hours ago	
suse_real_key	i69hBsnipSmayA		2	2		10 hours ago	
suse_real_key	N6JnYebBrQkjHg		2	2		10 hours ago	
suse_real_key	NQtFNsd658OQxA		2	2		10 hours ago	
suse_real_key	KbHk5aVownJc5Q		2	2		10 hours ago	
suse_real_key	9ORKgz30NOPgkQ		2	2		10 hours ago	
suse_real_key	BLbb6Fhk7j9S6g		2	2		10 hours ago	
suse_real_key	DbGtmxAdo1rXIQ		2	2		10 hours ago	

Secure Containers with SUSE Manager!



Activities

Google Chrome

Tue Apr 4, 14:10

SUSE Manager - Audi

SUSE Manager - Patc

SUSE Manager - Salt

Not secure

https://sumars-head.mgr.suse.de/rhn/manager/audit/cve

SUSE®Manager > Audit > CVE Audit

2 systems selected

admin

SUSE Test

Clear Menu

Search page

> Home

> Systems

> Salt

> Images

> Patches

> Channels

> Audit

CVE Audit


Subscription Matching


> OpenSCAP


> Visualization


CVE Audit

CVE 2016 - 7032

☒  Affected, patches available in channels which are not assigned

☒  Affected, at least one patch available in an assigned channel

☒  Not affected




☒  Patched

Audit Servers

Audit Images

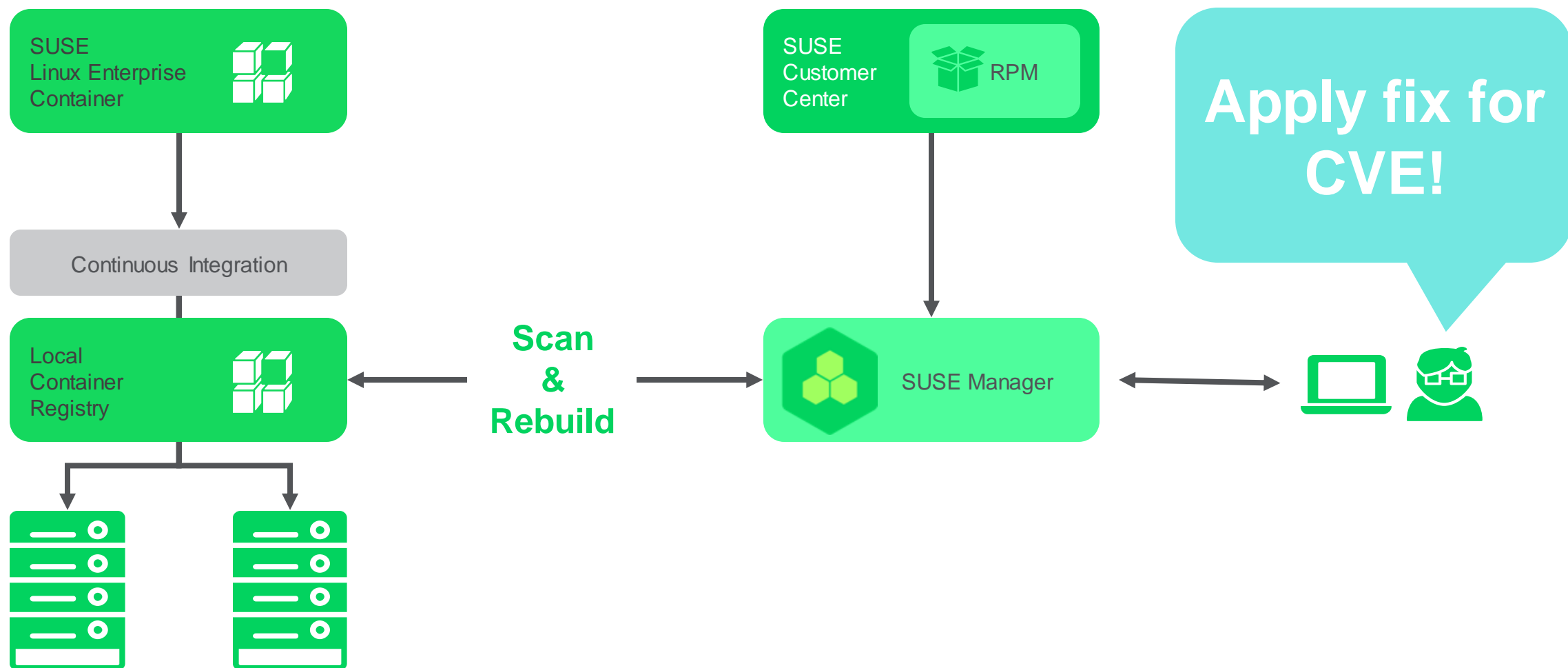
Items 1 - 25 of 36

25 items per page

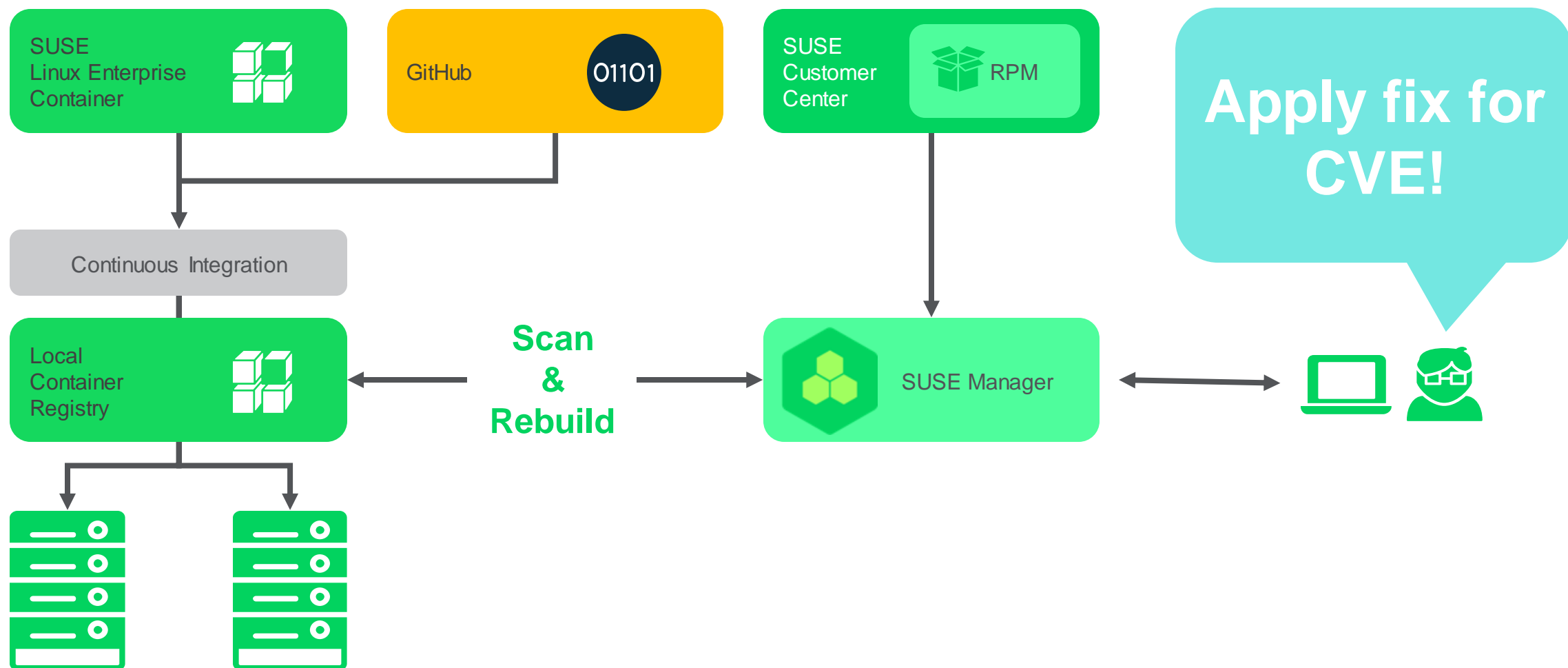
Status	Name	Actions
	suse_real_key:Dij9zrfp9o6cTA	No action required
	suse_key:latest	No action required
	suse_simply:Latest_simply	No action required

Click here!

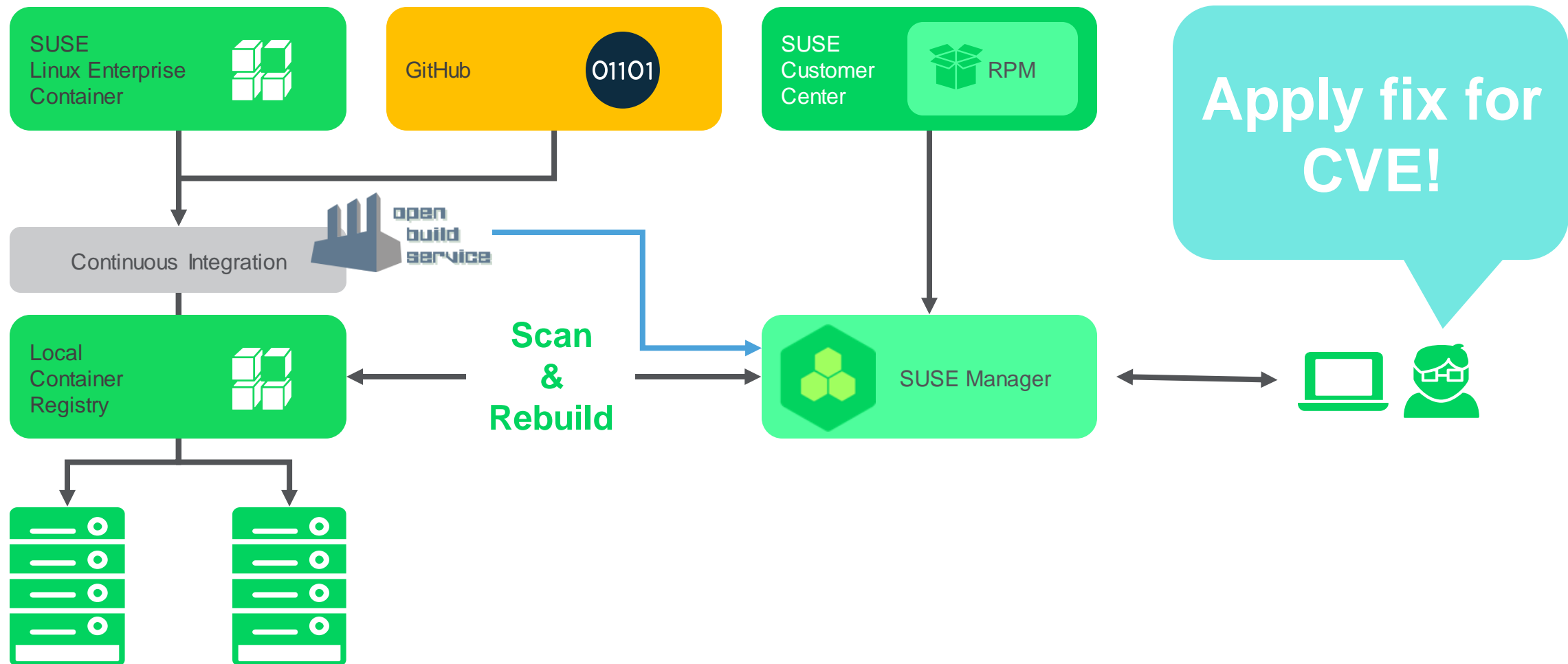
Secure Containers with SUSE Manager!



Secure Containers with SUSE Manager!



Secure Containers with SUSE Manager!



Goals Towards Infrastructure as Code

Allow the “heavy lifting” to be written by the experts

Expose the actual “variables” in an easy to use syntax (e.g. YAML)

- Cost (reduction)
- Speed (faster execution)
- Risk (remove errors and security violations)

Formulas with Forms

What are “**Formulas with Forms**”?

Formulas

- Salt’s approach to packaging configuration directives into bundles that can be applied as a whole.
- There is a GitHub project with ready-to-use Formulas
- Examples: postgresql, users, locale, timezone, apache, wordpress, ...

We’ve extended them with **Forms** that you can fill in from the SUSE Manager UI, so you can customize them as needed!

Activities

Google Chrome

SUSE Manager - Syst

SUSE Manager - Salt

Not secure

https://sumars-head.mgr.suse.de/rhn/manager/systems/details/formula/0?sid=1000010014

SUSE Manager > Systems

2 systems selected

admin

SUSE Test

System Groups

> System Set Manager

Advanced Search

Activation Keys

Stored Profiles

Custom System Info

> Autoinstallation

Software Crashes

Virtual Host Managers

> Salt

> Images

> Patches

> Channels

> Audit

> Configuration

> Schedule

> Users

Locale

Timezone

Name:

CET

Hardware Clock Set To Utc:

☒

Keyboard And Language

Language:

English (US)

Keyboard Layout:

English (US)

Save Formula

Clear values

Prev

Next

Test Formula

HD Partitions

Partition Boot

Name:

Boot

Mountpoint:

/boot

Size in GB:

Partition Root

Name:

Root

Mountpoint:

/root

Size in GB:

5000

+ Add Item

SUSE Manager - Admin - Setup Wizard - Mozilla Firefox

FileEditViewHistoryBookmarksToolsHelp

SUSE Manager - Admin - x

https://c73.arch.suse.de/rhn/manager/admin/setup/products150%gnome 3 screenshot

gnome 3 screenshot

SUSE®Manager > Admin > Setup Wizard

0 systems selectedadmin@hqBikeshop Inc. Headquarters

> Salt

> Images

> Patches

> Software

> Audit

> Configuration

> Schedule

> Users

> Admin

Setup Wizard

Organizations

Users

> Manager Configuration

> ISS Configuration

Task Schedules

Task Engine Status

ClearAdd products (4)

Server 15x86_6425 items per page

Items 1 - 1 of 1

Product Description	Arch	Channels
<input checked="" type="checkbox"/> SUSE Linux Enterprise Server 15	x86_64	<input type="checkbox"/> with recommended
<input checked="" type="checkbox"/> Basesystem Module 15 recommended		
<input type="checkbox"/> Desktop Applications Module 15		
<input type="checkbox"/> SUSE Linux Enterprise Live Patching 15		
<input checked="" type="checkbox"/> SUSE Manager Tools 15 recommended		
<input type="checkbox"/> Containers Module 15		
<input checked="" type="checkbox"/> Server Applications Module 15 recommended		
<input type="checkbox"/> SUSE Cloud Application Platform Tools Module 15		

Refresh the product catalog from SUSE Customer Center

Channels

Channel Families

Products

Product Channels

Subscriptions

Refresh

Selected products

SUSE Linux Enterprise Server 15 [x86_64]

Basesystem Module 15 [x86_64]

SUSE Manager Tools 15 [x86_64]

Server Applications Module 15 [x86_64]

Why aren't all SUSE products displayed in the list?

The products displayed on this list



/uju: 'ni/

Please welcome **Uyuni**,
the new upstream project for SUSE Manager!



<https://www.uyuni-project.org>



@UyuniProject



uyuni-announce+subscribe@opensuse.org

Uyuni upstream project!

- Combines Salt and Spacewalk efforts into one project
- CI/CD with automated testing
- Feature-complete, not “open core”

SUSE Manager evolution: **Deeper & Wider**

- **Optimize for smaller deployments**
 - SLES for SAP (e.g. on IBM Power Systems): towards and “out of the box experience”
- **Scale to the largest infrastructures**
 - Very large retailers and other distributed infrastructures (tens or hundreds of thousands of managed nodes)
- **Go beyond RPM: Ubuntu management**
- **New use cases: Cover the complete Infrastructure DevOps lifecycle**
 - Advanced image building
 - Bare metal and API-driven deployment
 - Monitoring and Log Management with “AI” (actionable insights)
 - Virtual Machine Management
 - Cluster orchestration (including CaaSP, SES, SOC)
 - Security scanning/auditing and enforcement from physical to container, from the datacenter to the public cloud
 - Asset Management

SUSE Manager 4.0

Content Lifecycle

Moving packages across multiple stages, like DEV, QA, Production, is a core feature of SUSE Manager. However, it's only available on a CLI level yet.

- Provide channel staging ability in UI
- Keep and improve CLI staging ability
- Document staging better, provide best practices
- Manage stages (devel, test, production, ...)
 - add, remove, rename
- Promote sets of channels from one stage to another

Monitoring Vision

Vision: SUSE Manager can provision, configure, and automate monitoring infrastructure

- Self-monitoring:
 - Documentation on monitoring best practices for SUSE Manager Server and Proxy
 - Enable SUSE Manager to export metrics about its health
- Monitoring automation:
 - Auto-provision Prometheus node exporter on minions
 - Ship maintained versions of Prometheus (backend) and Grafana (frontend)
 - Provision Prometheus monitoring hosts
 - Deploy and configure Grafana visualization tool
 - Enable alerting based on monitoring

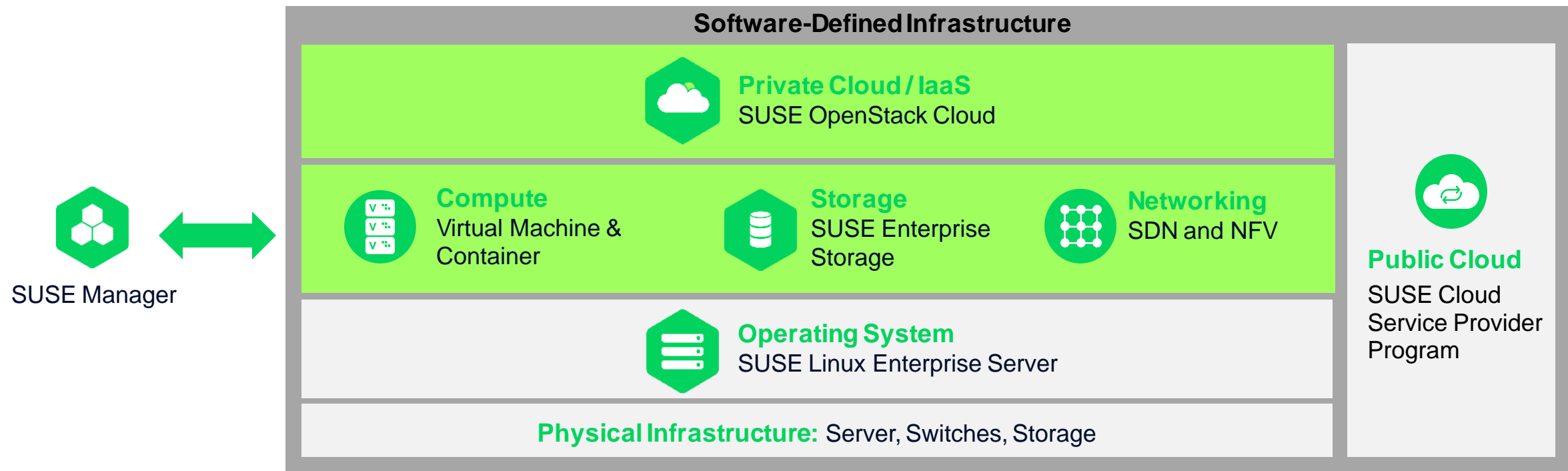
Extending OS support

- **Ubuntu LTS** (*TBD: also on IBM platforms?*)
- **openSUSE Leap 42.3 and 15**
- *Others (CentOS, Debian, OEL) based on demand*

SLE 15 Base Product

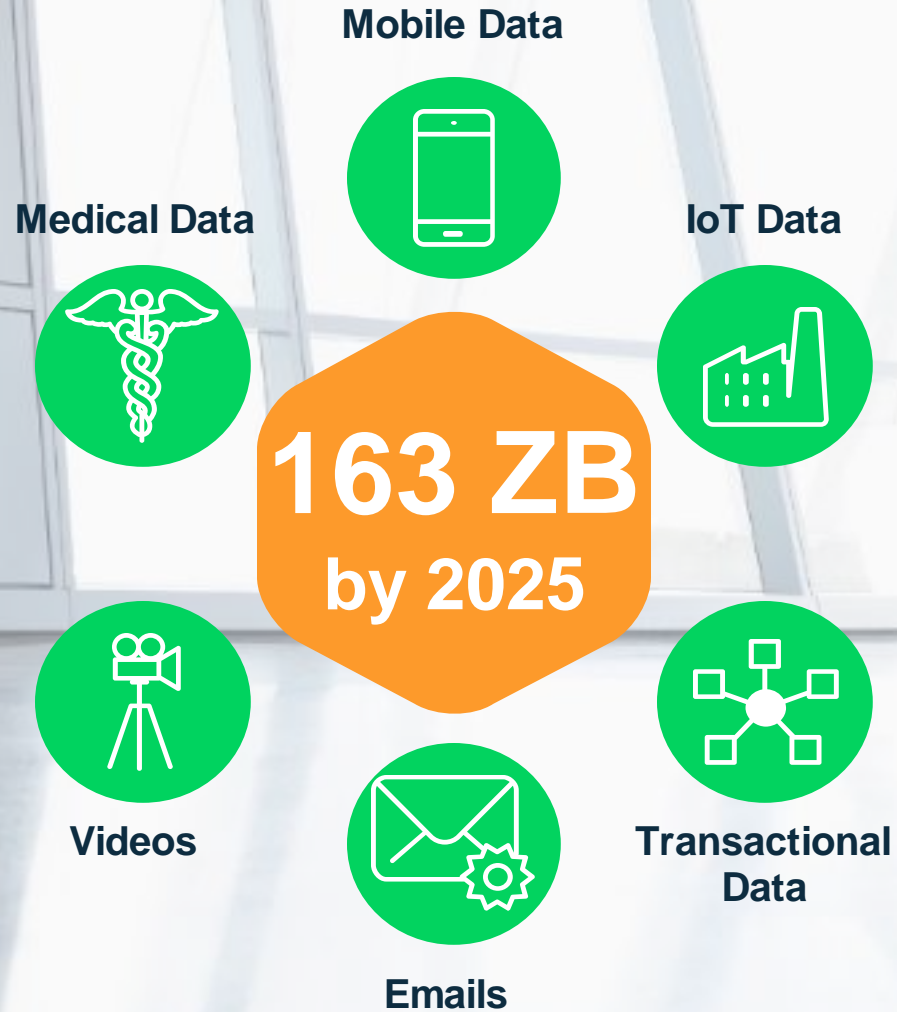
- **Consistent with other SLE-based products like SLES for SAP Applications**
- **One compact installation media for all**

Infrastructure Dev(Sec)Ops





The Data Explosion Continues



Limiting Factors of Traditional Enterprise Storage



**Difficult to Scale and
Manage Data Growth**



Expensive



**Won't Extend to
the Software-defined
Data Center**

Address the Data Explosion with SUSE Enterprise Storage



Maximize

Scalability and
Availability



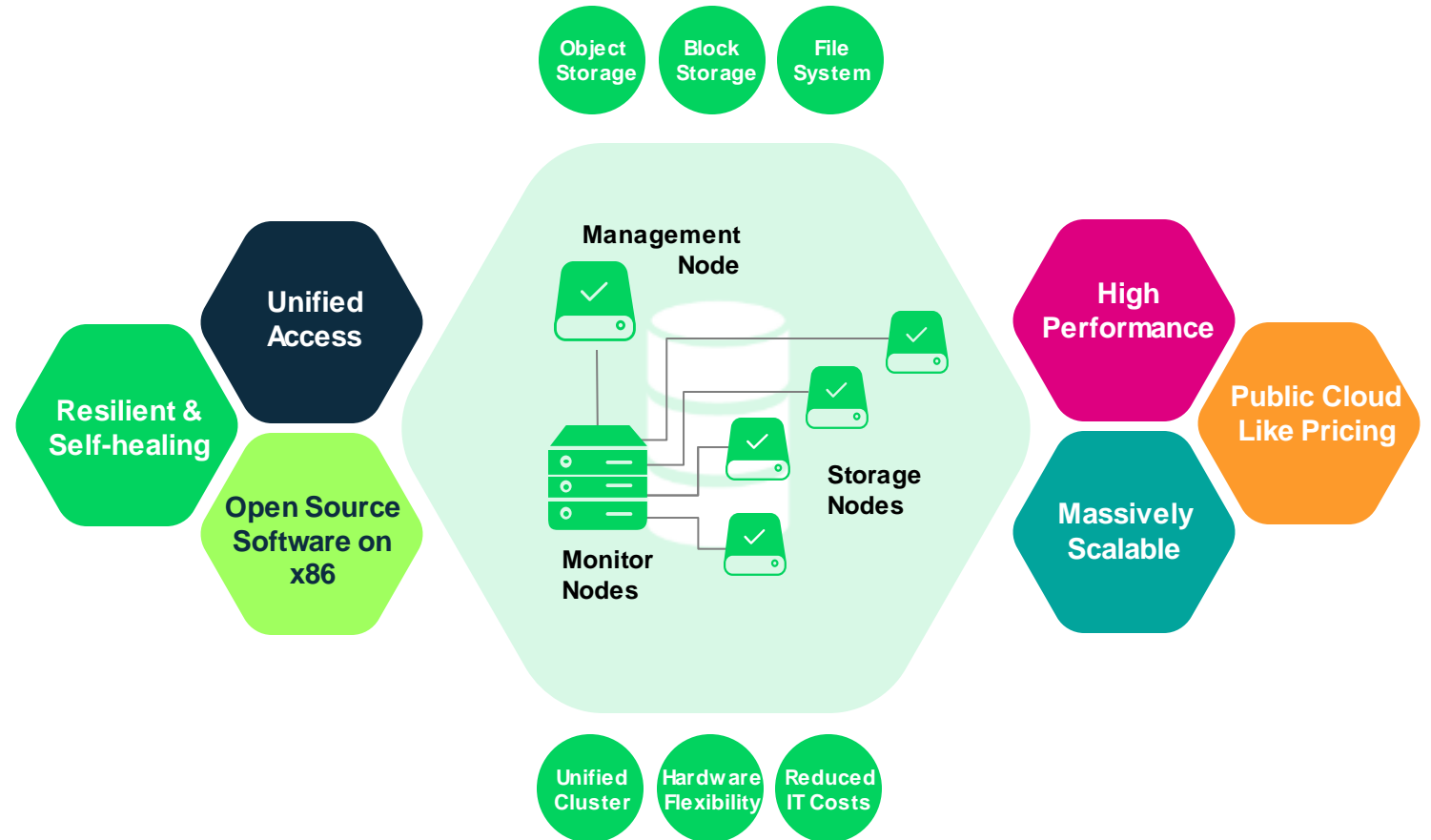
Reduce

Costs both CAPEX
and OPEX



Adapt

Quickly to changing
market conditions



SUSE Enterprise Storage 5.5

SUSE openATTIC Advanced Graphical Interface

SUSE Enterprise Storage

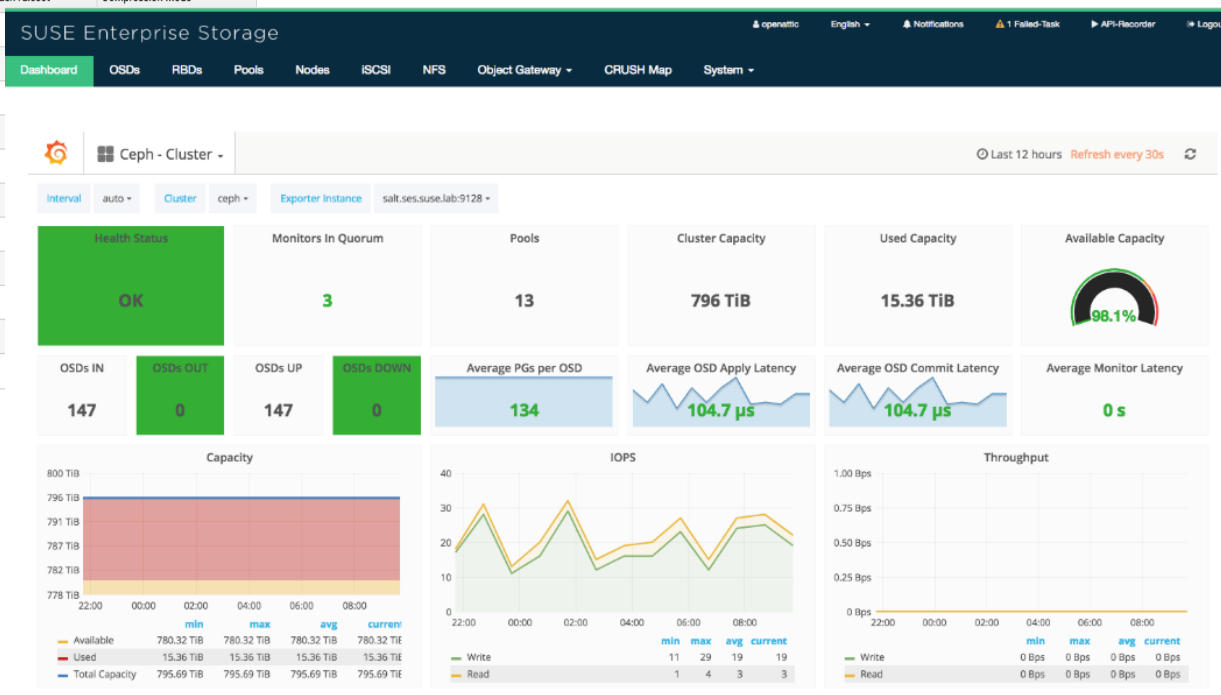
Dashboard OSDs RBDs Pools Nodes iSCSI NFS Object Gateway CRUSH Map System

Ceph Pools

Users
Buckets

Name	ID	Used	Applications	Placement groups	Replica size	Erasure code profile	Type	Crush ruleset	Compression mode
.rgw.root	1	0.00%	rgw	8	3		replicated	0	
cephfs_data	6	0.00%	cephfs	128	3		replicated	0	
cephfs_metadata	7	0.00%	cephfs	128	3		replicated	0	
default.rgw.buckets.index	28	0.00%	rgw	8	3		replicated	0	
default.rgw.control	2	0.00%	rgw	8	3		replicated	0	
default.rgw.log	4	0.00%	rgw	8	3		replicated	0	
default.rgw.meta	3	0.00%	rgw	8	3		replicated	0	
iscsi-images	5	0.00%	rbd	128	3		replicated	0	
vmwarecert	9	0.08%	rbd	4096	3		replicated	0	
vmwaretest	8	0.88%	rbd	2048	3		replicated	0	

Showing 1 to 10 of 10 items







SUSE OpenStack Cloud Bridging the Two Worlds of IT

**Traditional IT
Evolutionary
(mode 1)**

**Agile IT
Revolutionary
(mode 2)**

SUSE Cloud OpenStack Directions

- +Improve Day 2 Operations
- +Performance and Scalability
- +Networking Capabilities
- +Integrate with New Innovation





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H51

AREA 51







Thank You



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