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OpenNebula
A Reference Open Cloud Stack to Enable Interoperability

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Acknowledgments

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About Interoperability with OpenNebula

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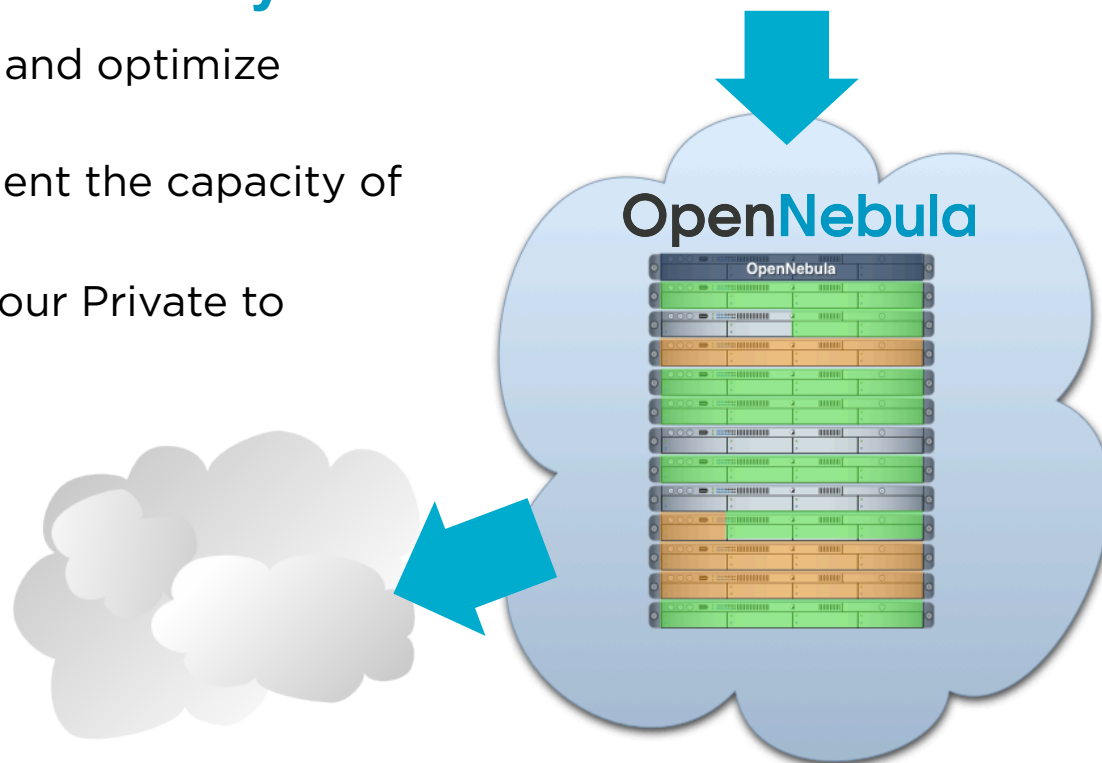
What is OpenNebula?

Open-source Toolkit to Build your IaaS Cloud

IaaS Cloud Provider

- Simple web interface
- Raw infrastructure resources
- Pay-as-you-go & elastic capacity

GOGRID

rackspace HOSTING

flexiscale™

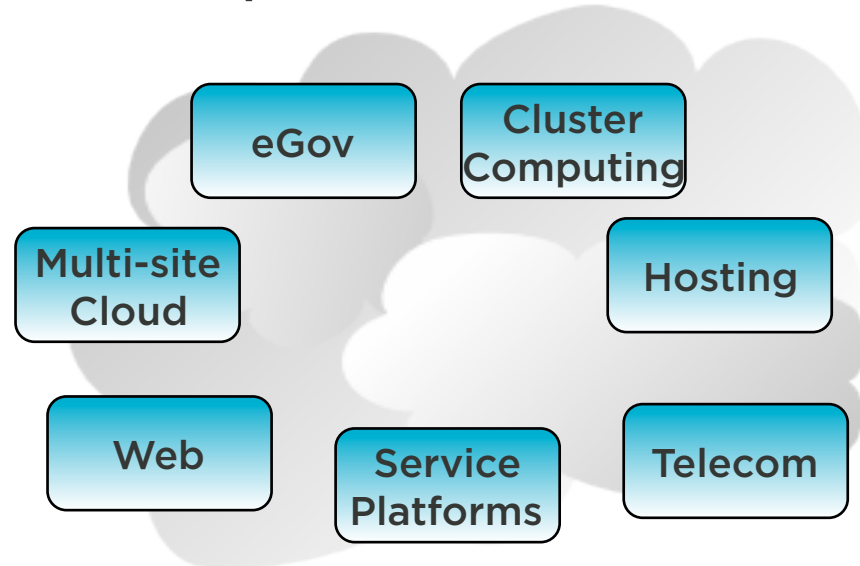amazon webservices™

Enabling Technology to Build your Cloud

- **Private Cloud** to simplify and optimize internal operations
- **Hybrid Cloud** to supplement the capacity of the Private Cloud
- **Public Cloud** to expose your Private to external users

OpenNebula

What is the Field of Application of OpenNebula?   OpenNebula.org

An Enterprise-grade Technology Addressing eGov, Industry and Research Use Cases

Developed to Address Requirements from Real-life Use Cases

eGov

Cluster Computing

Multi-site Cloud

Hosting

Web

Service Platforms

Telecom

An Enterprise-grade Technology

Mature and Scalable
- Many production deployments
- Massively scalable

Secure and Robust
- Secure multi-tenancy
- Fault tolerance

Stable and Robust
- Thorough testing process
- Community testing

Interoperable
- Platform independent
- Interoperable and customizable

What is the OpenNebula Open-Source Project?

Building the Industry Standard Open Source Cloud Computing Tool

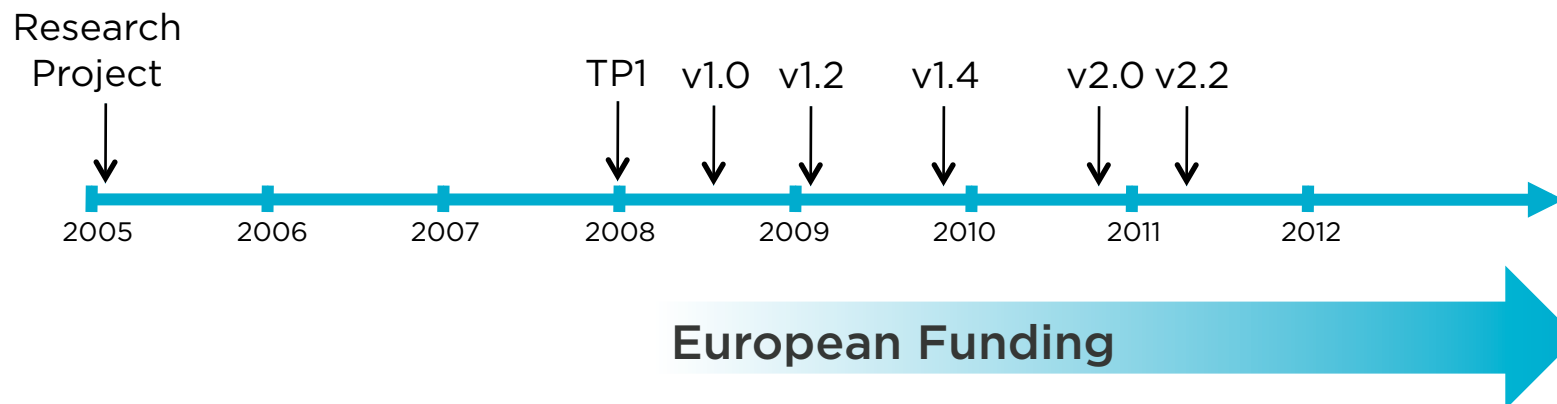## Lead Innovation in Enterprise-Class Cloud Computing Management

- Develop, maintain and assure the quality of OpenNebula
- Collaborate with open-source and research projects and communities
- Support the community and the ecosystem

An Active and Engaged Community

- 4,000 downloads/month
- 100 active contributors
- OSS distribution channels

ubuntu debian openSUSE

From a Research Project on Scalable Management of VMs

European Funding

Timeline: 2005 (Research Project), 2006, 2007, 2008 (TP1), v1.0, 2009 (v1.2), 2010 (v1.4), 2011 (v2.0 v2.2), 2012

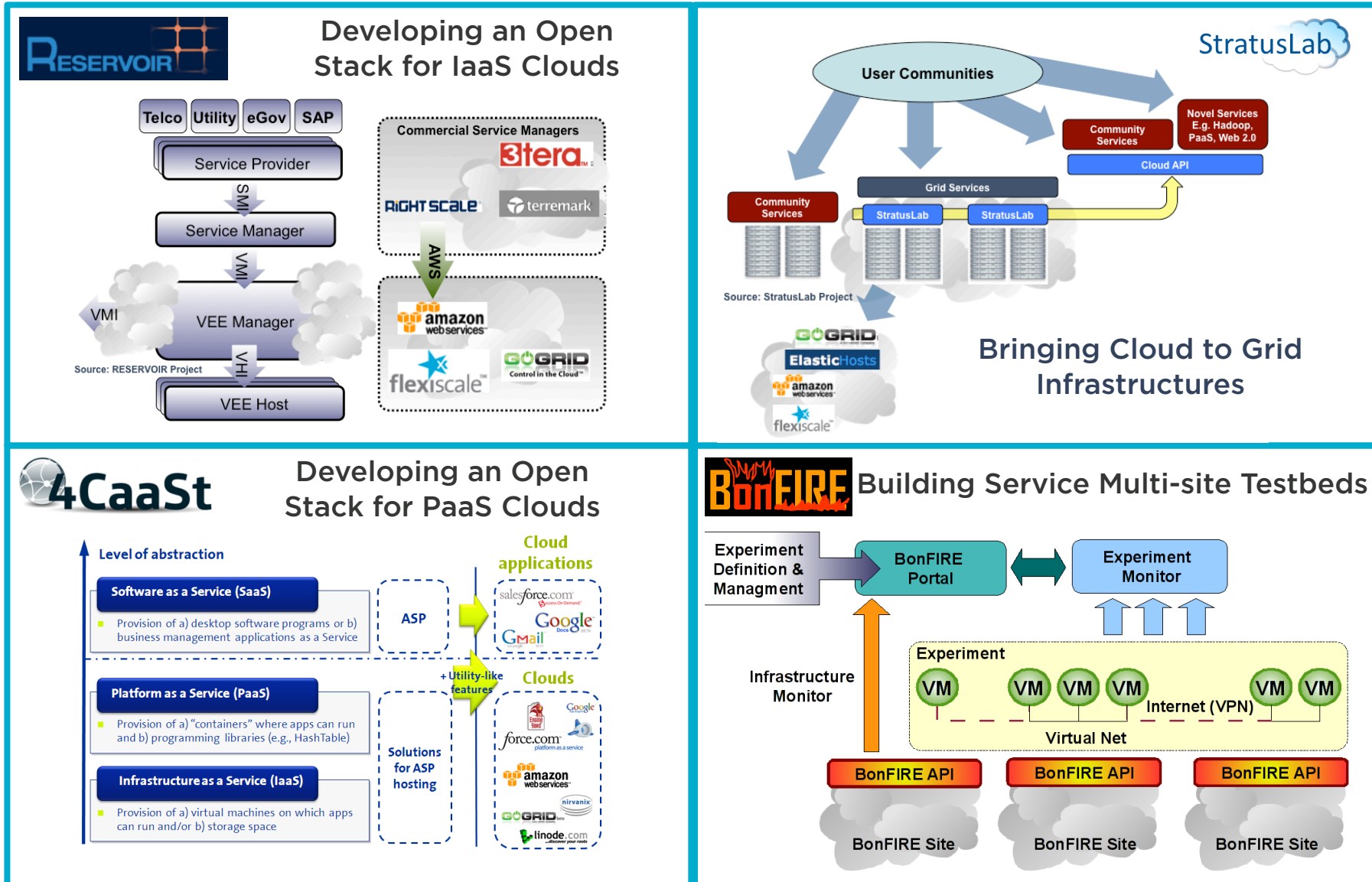*Organizations Building Clouds and Innovative Projects*

Organizations Building Clouds for Development, Testing and Production

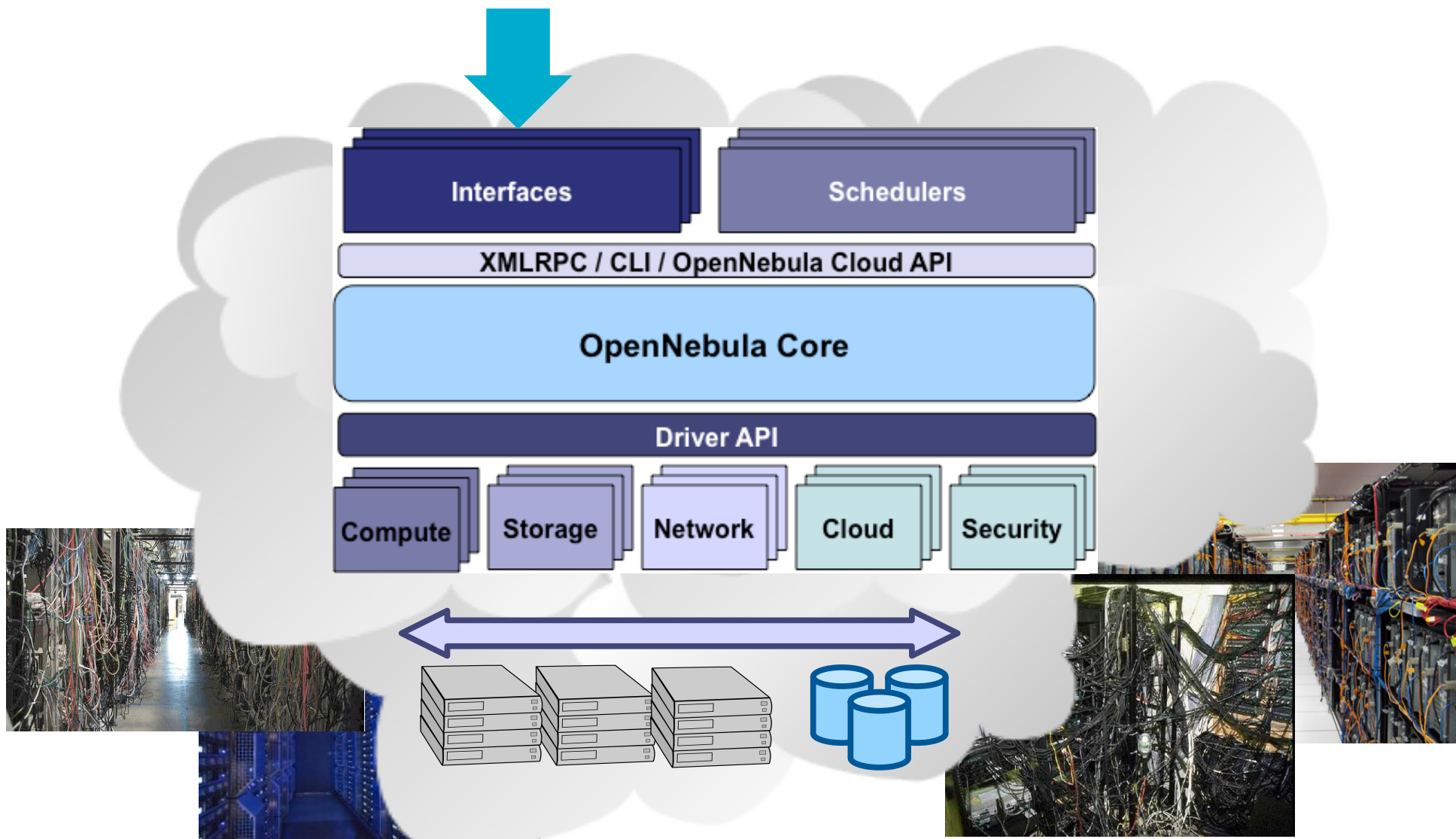## Projects Building an Open Cloud Ecosystem Around OpenNebula

Importance of Interoperability in the Projects

Developing an Open Stack for IaaS Clouds

Source: RESERVOIR Project

Bringing Cloud to Grid Infrastructures

Source: StratusLab Project

Developing an Open Stack for PaaS Clouds

Building Service Multi-site Testbeds

Why Is Interoperability Important for Us?

Offering Common Interfaces and Fitting into any Data Center

What Is Our Approach for Interoperability?

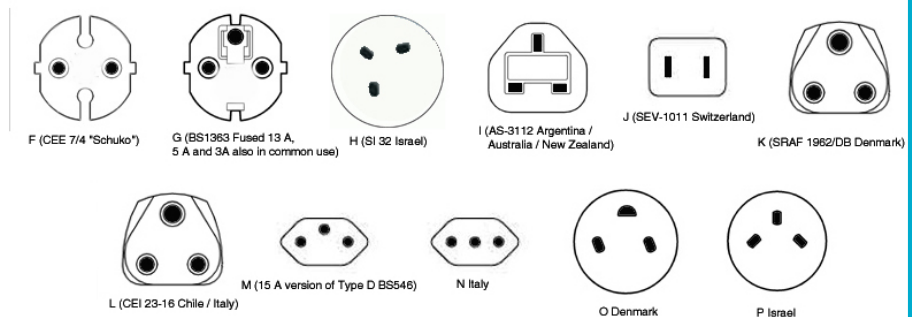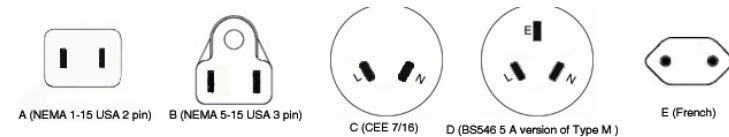*Leveraging Existing Standards and Implementing Interoperation*

Standardization

- Implement standards
- Integrate with standards

Which Standard?

- Different *de jure* standards
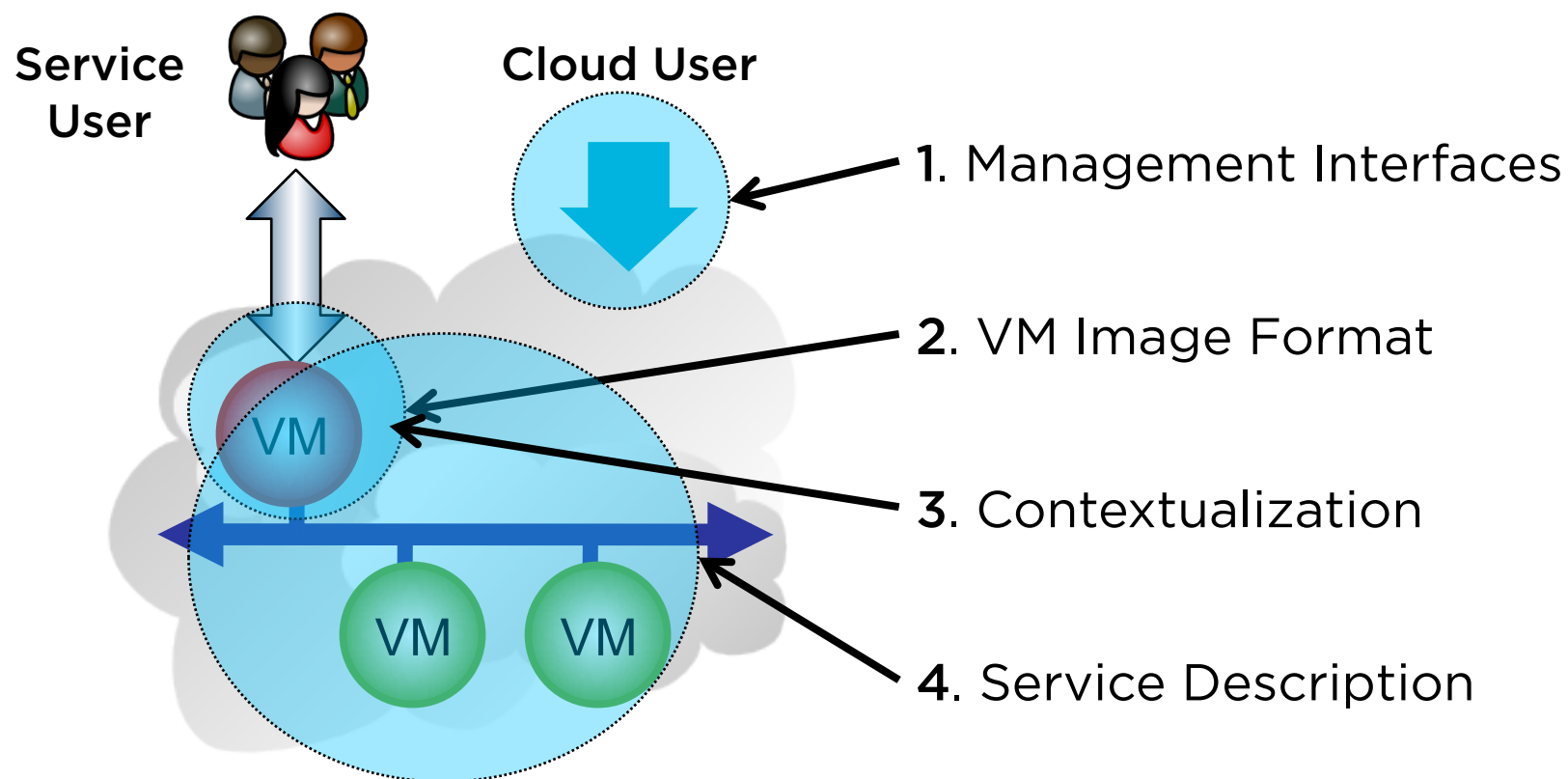- Several *de facto* standards

Interoperation

- Implement adaptors
- Use transformers

I Want to Move my Workload to Another Cloud without Changes

Transparent Migration of Services across Clouds

- Infrastructure cost reduction
- High availability and fault tolerance
- User proximity

Service User

Cloud User

1. Management Interfaces

2. VM Image Format

3. Contextualization

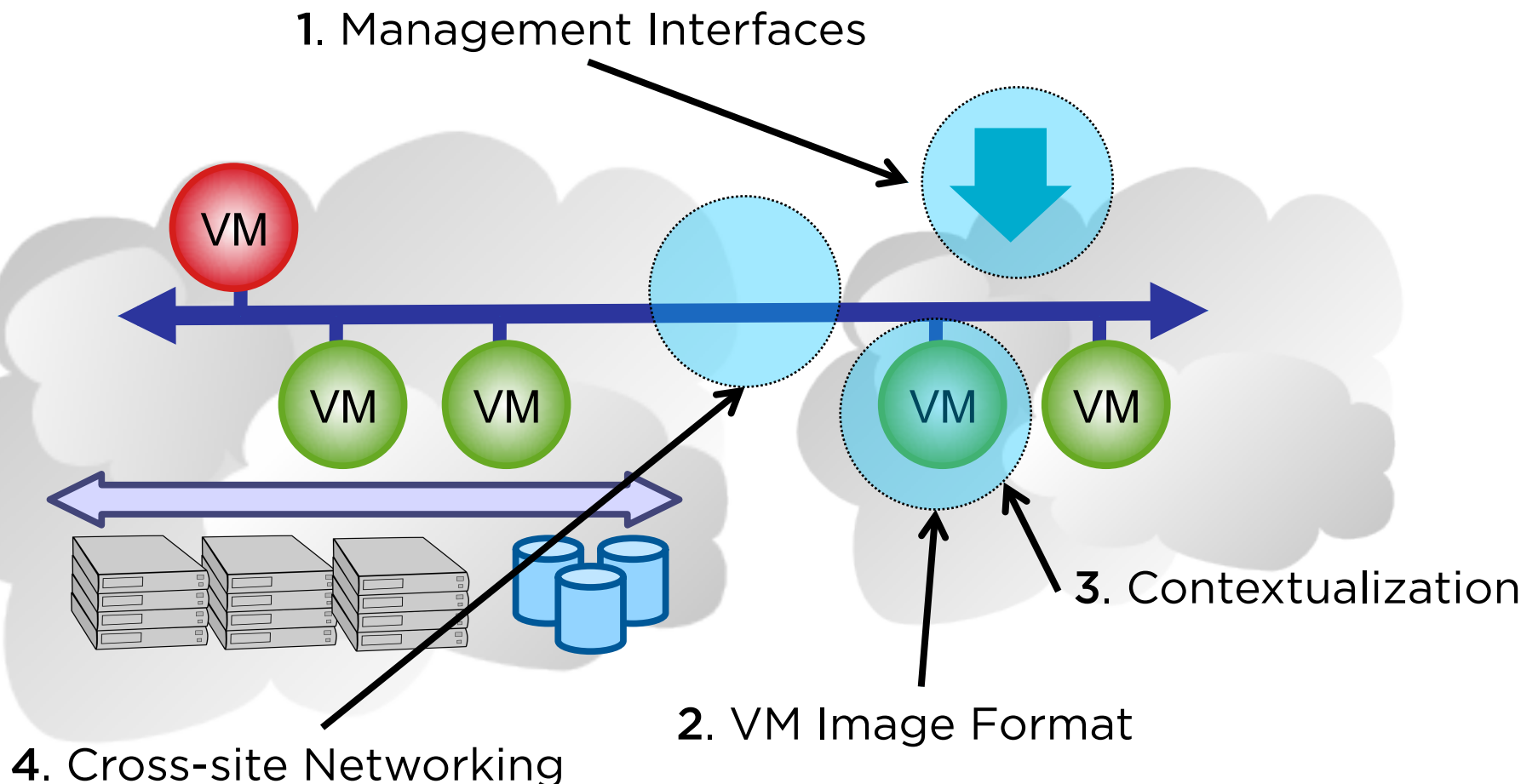**4.** Service Description

VM

VM   VM

Implementation of Common APIs and Adaptors for other Projects

I Want to Combine My Private Cloud with a Public Cloud without Changes

Transparent Combination of Local Resources with Cloud Resources

- Address fluctuating or peak demands
- More cost effective for no critical and HTC workloads

1. Management Interfaces

VM

VM

VM

VM

VM

3. Contextualization

2. VM Image Format

4. Cross-site Networking

Development of Adaptors

Questions?

We Will Be Happy to Answer Any Question