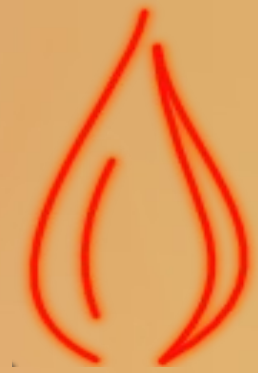
Heat - Orchestration for OpenStack

Introduction to OpenStack Orchestration



Steven Hardy (shardy@redhat.com)

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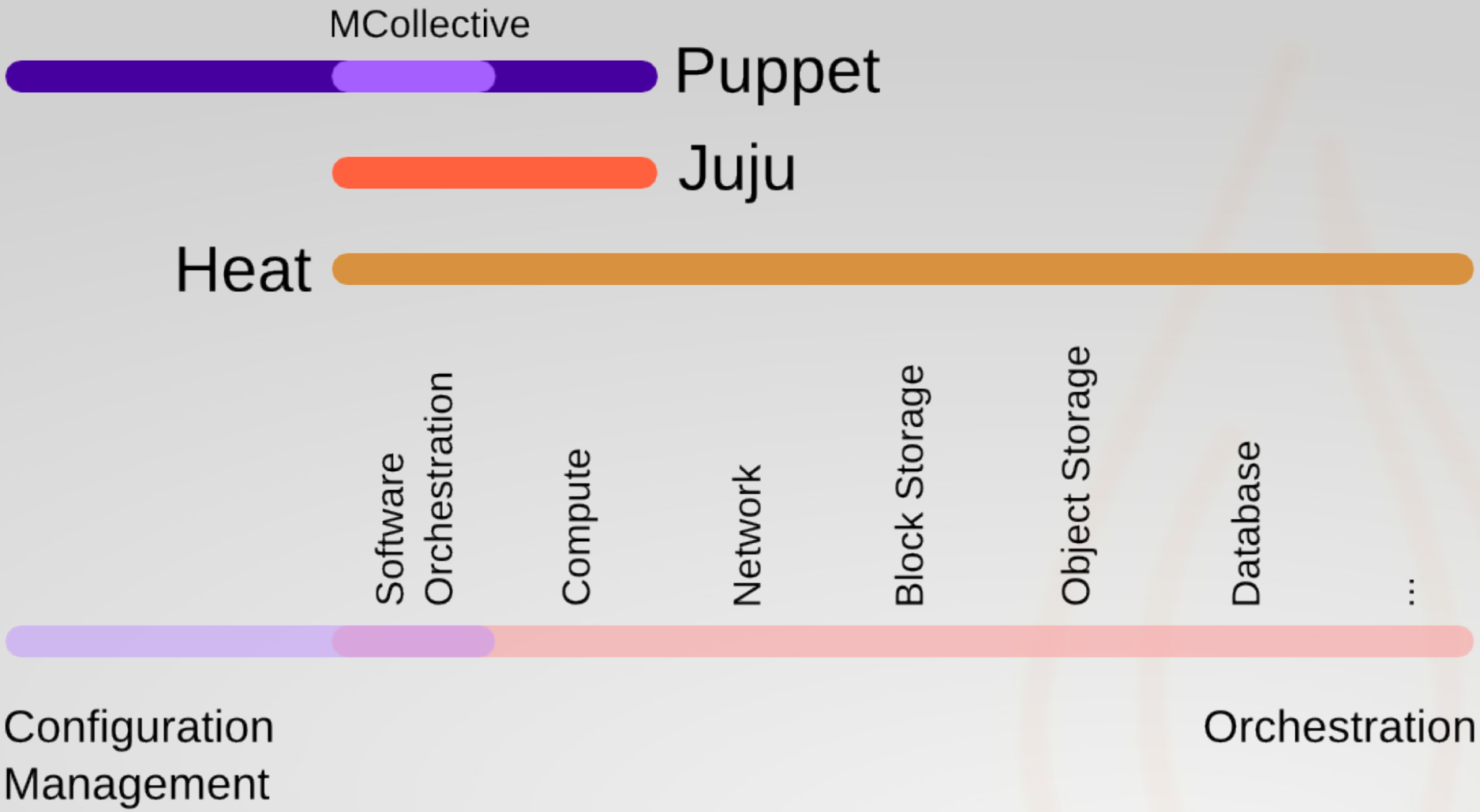
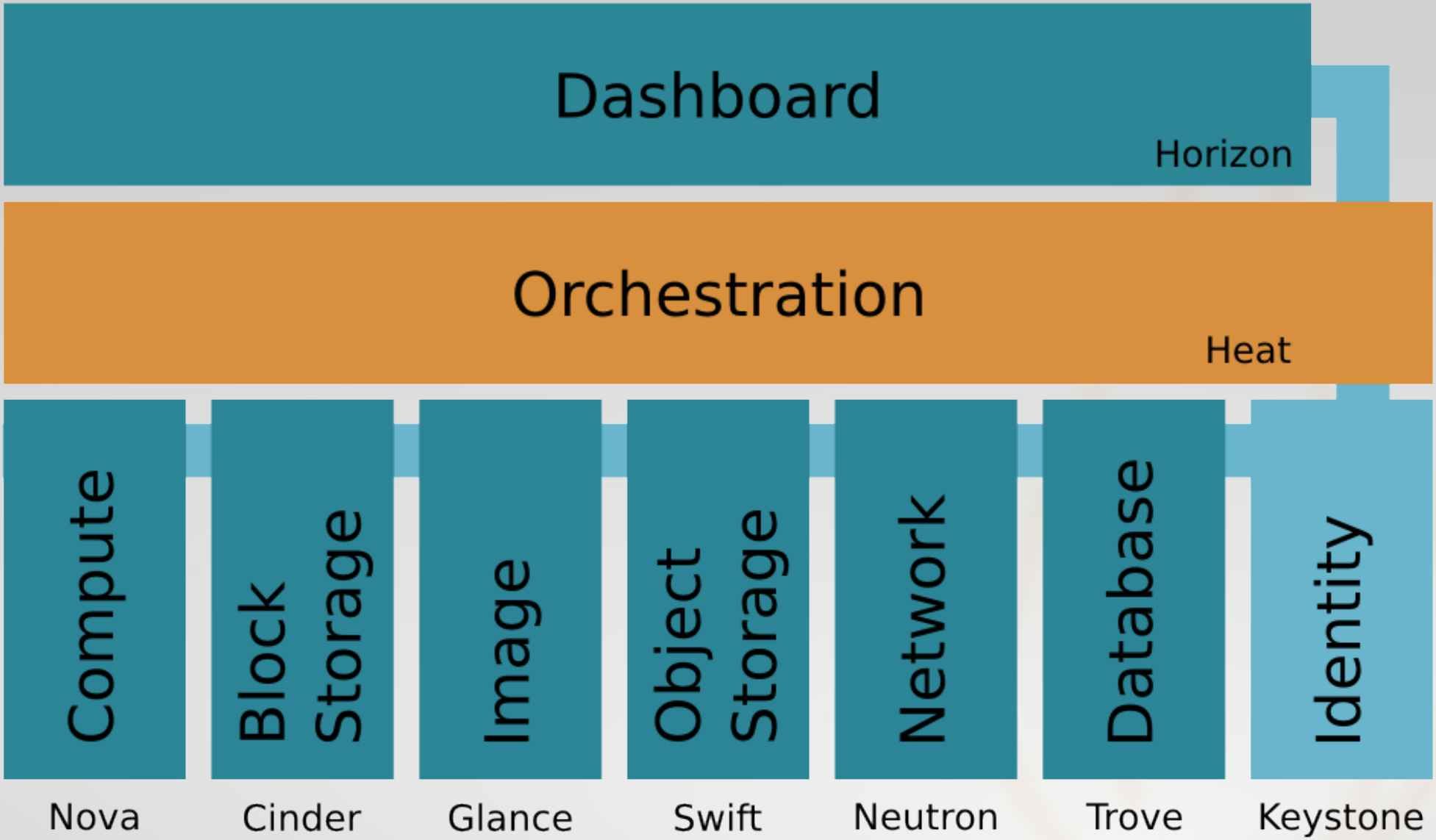
Orchestration Overview

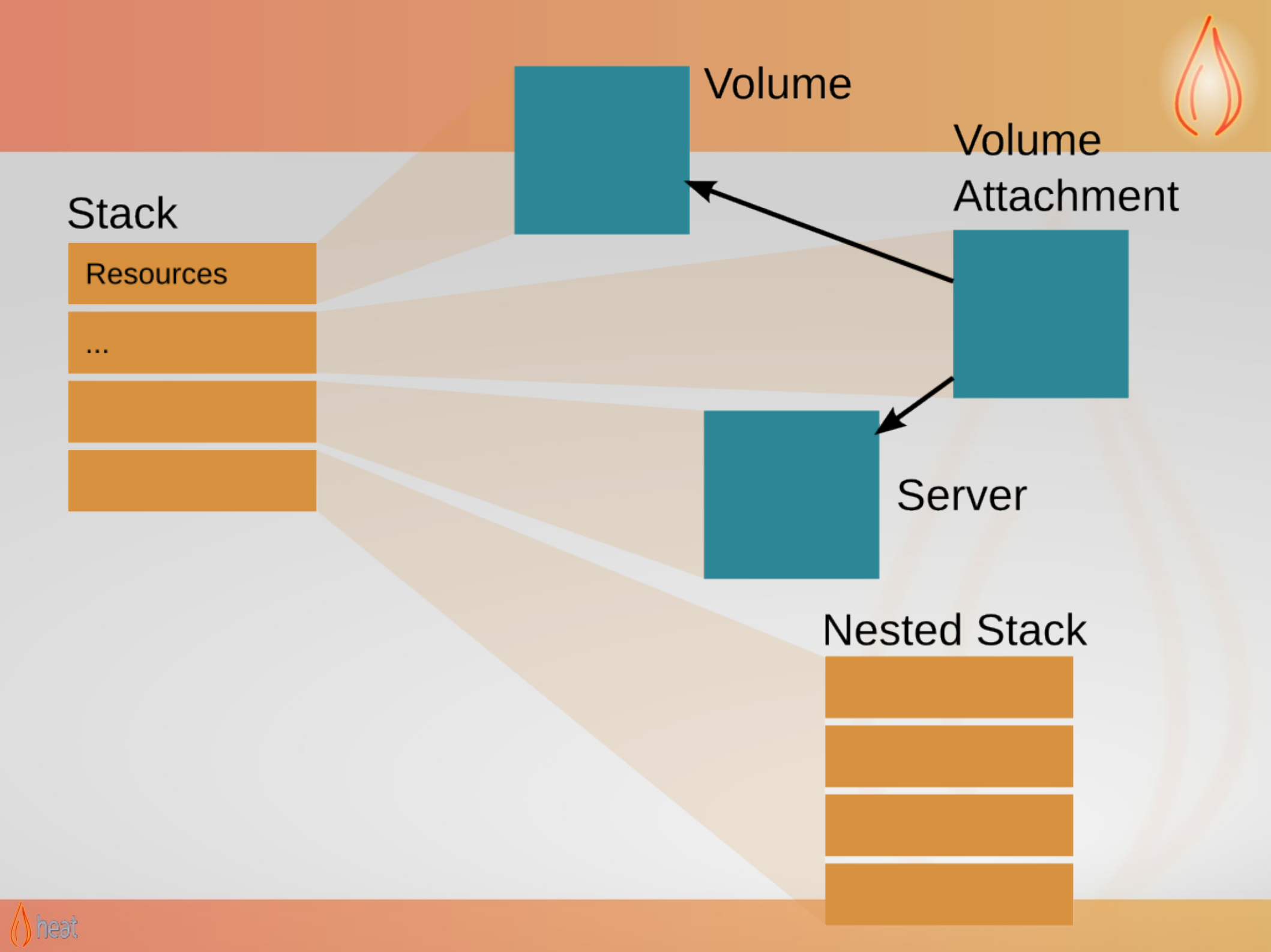


Heat Overview

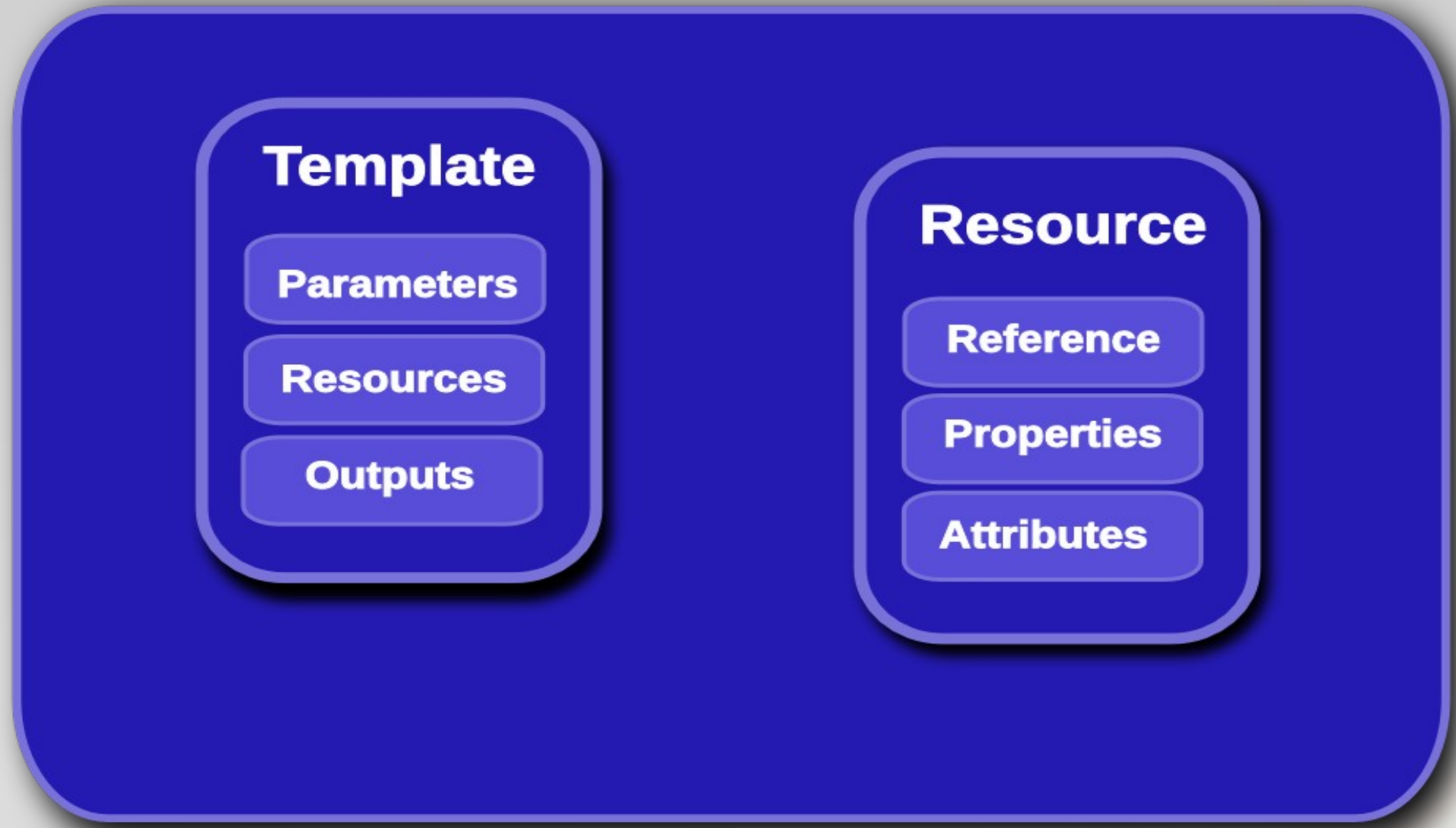
- Fully repeatable deployments
- Integrated OpenStack project
- Declarative, template driven model
- Version your infrastructure like code!
- Implicit dependency management
- Abstract details of underlying API's
- Compose complex deployments, modularity, reuse
- Simplify management of grouped resources
- Plugin model, fully extensible

Heat Overview




Volume
Volume
Attachment
Stack
Resources
...
Server
Nested Stack
heat

Heat Template Overview



Heat Orchestration Template

```
heat_template_version: 2013-05-23
parameters:
  image:
   type: string
resources:
  my_instance:
    type: OS::Nova::Server
    properties:
      flavor: m1.small
      image: {get_param: image}
outputs:
  networks:
    description: my_instance network details
    value: {get_attr : [my_instance, networks]}
```

Parameters/Constraints

```
heat_template_version: 2013-05-23

parameters:
  image:
    type: string
    description: Image to use for the instance to be created.
    default: cirros-0.3.2-x86_64-disk
    constraints:
      - allowed_values: ['cirros-0.3.2-x86_64-disk', 'fedora-20.x86_64']

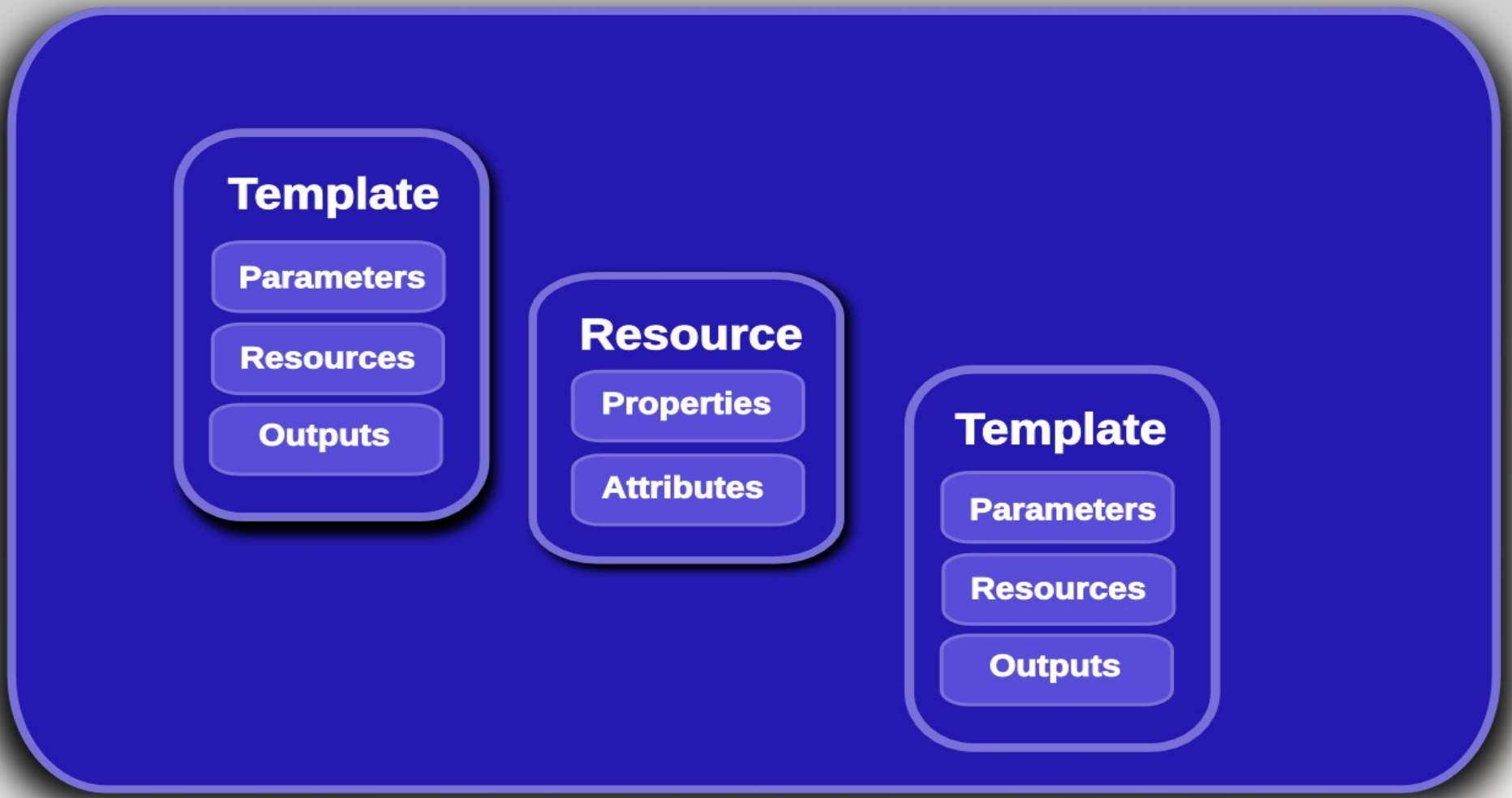
  volume_size:
    type: number
    description: Size of volume to attach to instance
    default: 1
    constraints:
      - range: {min: 1, max: 10}
```

Heat Template Links

- docs.openstack.org/developer/heat/template_guide
- docs.openstack.org/developer/heat/template_guide/hot_spec.html
- github.com/openstack/heat-templates

- heat resource-type-list
- heat resource-type-show OS::Nova::Server

Heat Nested Stack Templates



Nested Stack Example

```
heat_template_version: 2013-05-23
resources:
  my_nested:
    type: my_nested.yaml
```

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```

Grouped Resources

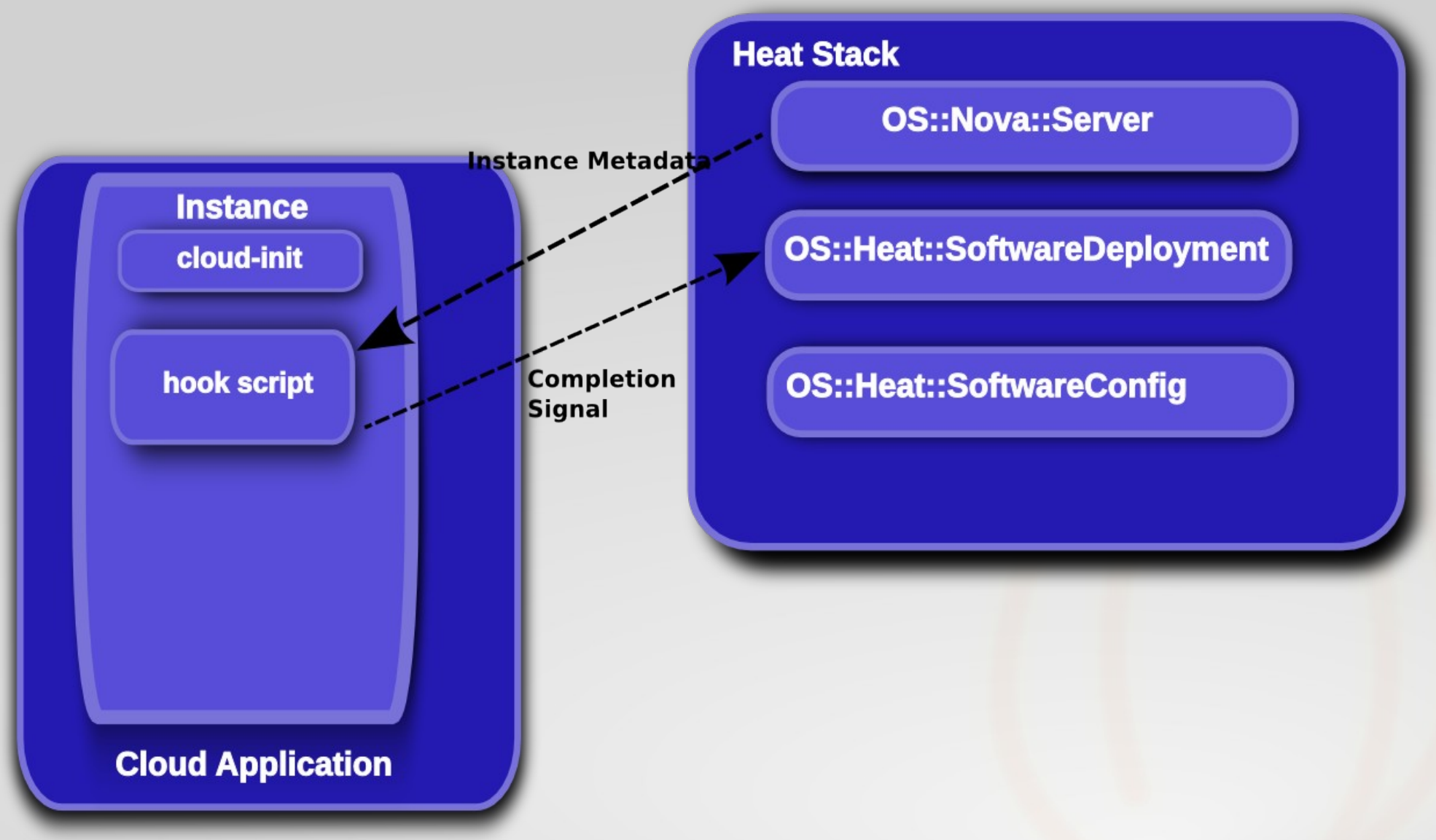
```
heat_template_version: 2013-05-23
resources:
  my_group:
    type: OS::Heat::ResourceGroup
    properties:
      count: 50
      resource_def: {type: my_nested.yaml}
```

Environments

```
parameters:
  key_name: mykey
resource_registry:
  My::Custom::Server : my_server.yaml
  OS::Nova::Server : override_nova.yaml
```

- python-heatclient resolves local files and URLs
- Files associated with environment are passed along with the stack-create/update API request
- heat stack-create mystack -f template.yaml -e environment.yaml

Software Config



Getting Started

- Devstack (Fedora/Ubuntu)
- RDO/RHOS (Fedora/CentOS/RHEL)
- Debian/Ubuntu Packages
- Rackspace Orchestration Service
- …

Icehouse key new features

- HOT DSL feature-complete and declared stable
- Software-config initial implementation complete
- “stack domain users” (no more admin requirement)
- Native auto-scaling resources
- Pluggable parameter constraints
- Pluggable template parser/functions
- Scalable heat-engine
- “management API” additions

Juno Roadmap

- Recovery from failed states/convergence
- Further scalability improvements
- Autoscaling enhancements
- Auth model updates
- Stack preview
- Quota support
- Improved functional/upgrade testing
- …

Questions?

- wiki.openstack.org/wiki/Heat
- docs.openstack.org/developer/heat/
- github.com/hardys/presentations
- docs.openstack.org/developer/heat/template_guide
- docs.openstack.org/developer/heat/template_guide/hot_spec.html
- github.com/openstack/heat-templates