

Heat - Orchestration for OpenStack

Introduction to OpenStack Orchestration

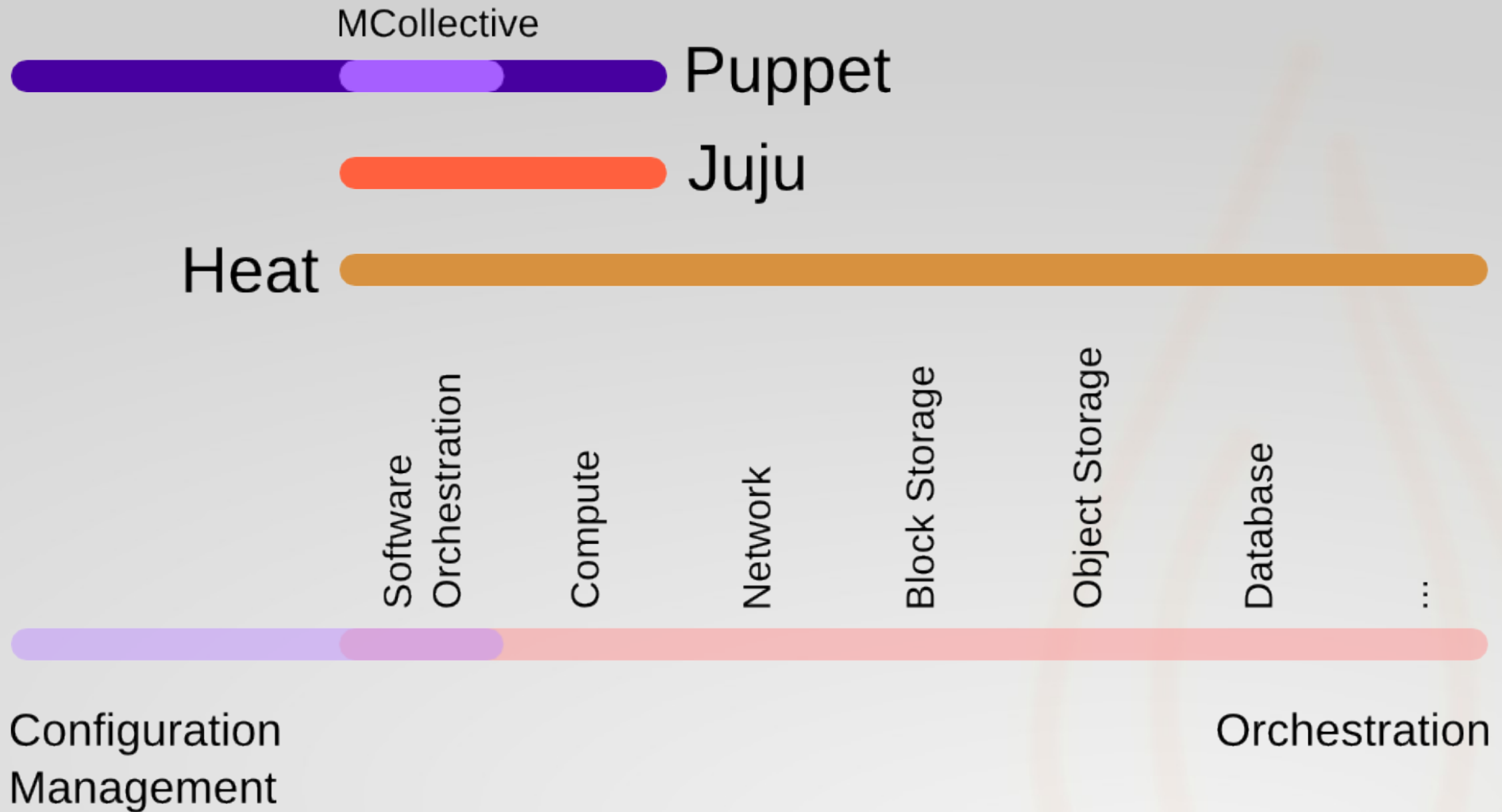


Steven Hardy (shardy@redhat.com)

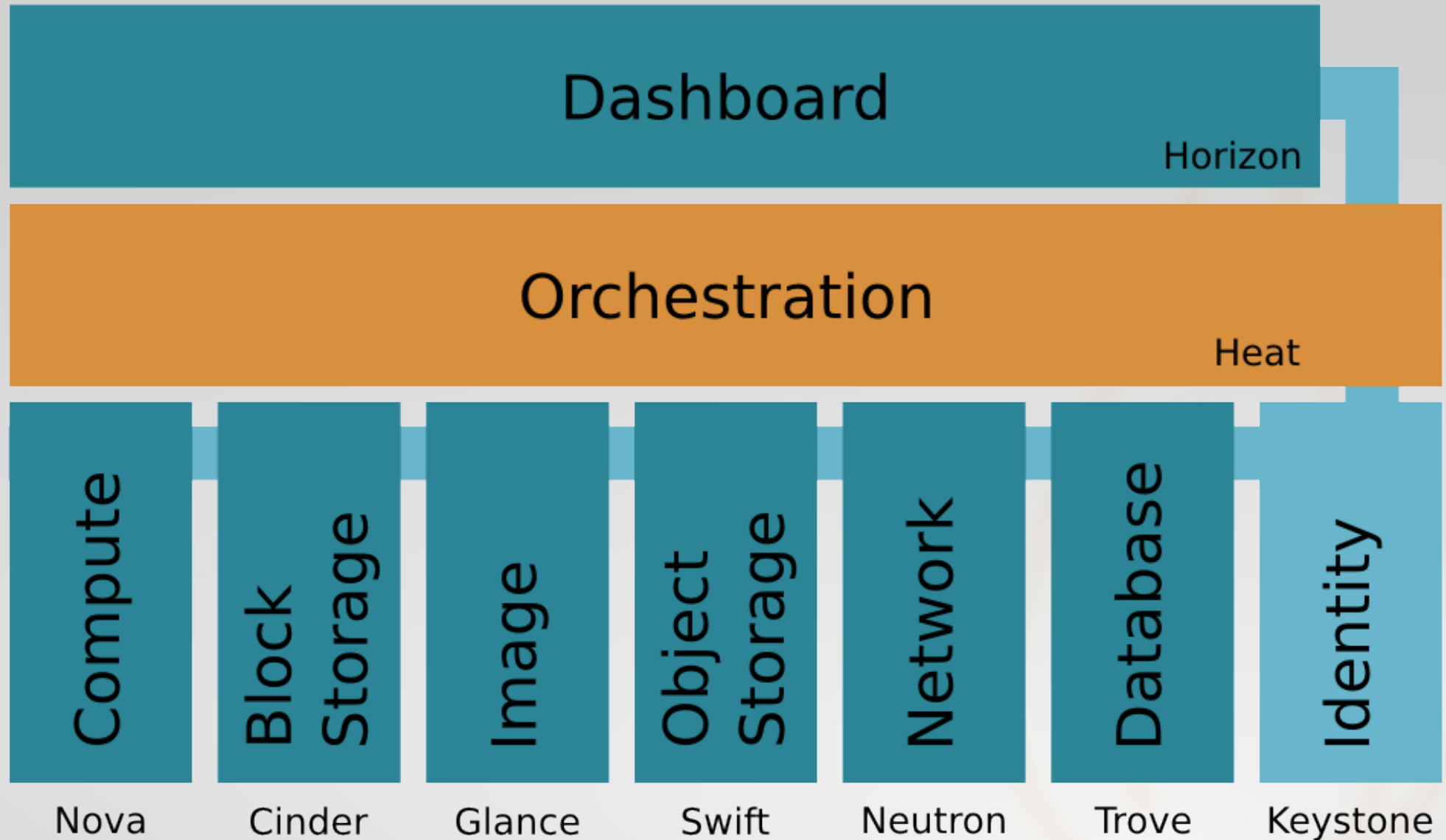
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12th May 2014

Orchestration



Heat Overview





Stack

Resources

...

Volume

Volume
Attachment

Server

Nested Stack

Heat Template Overview



Template

Parameters

Resources

Outputs

Resource

Reference

Properties

Attributes



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:
```

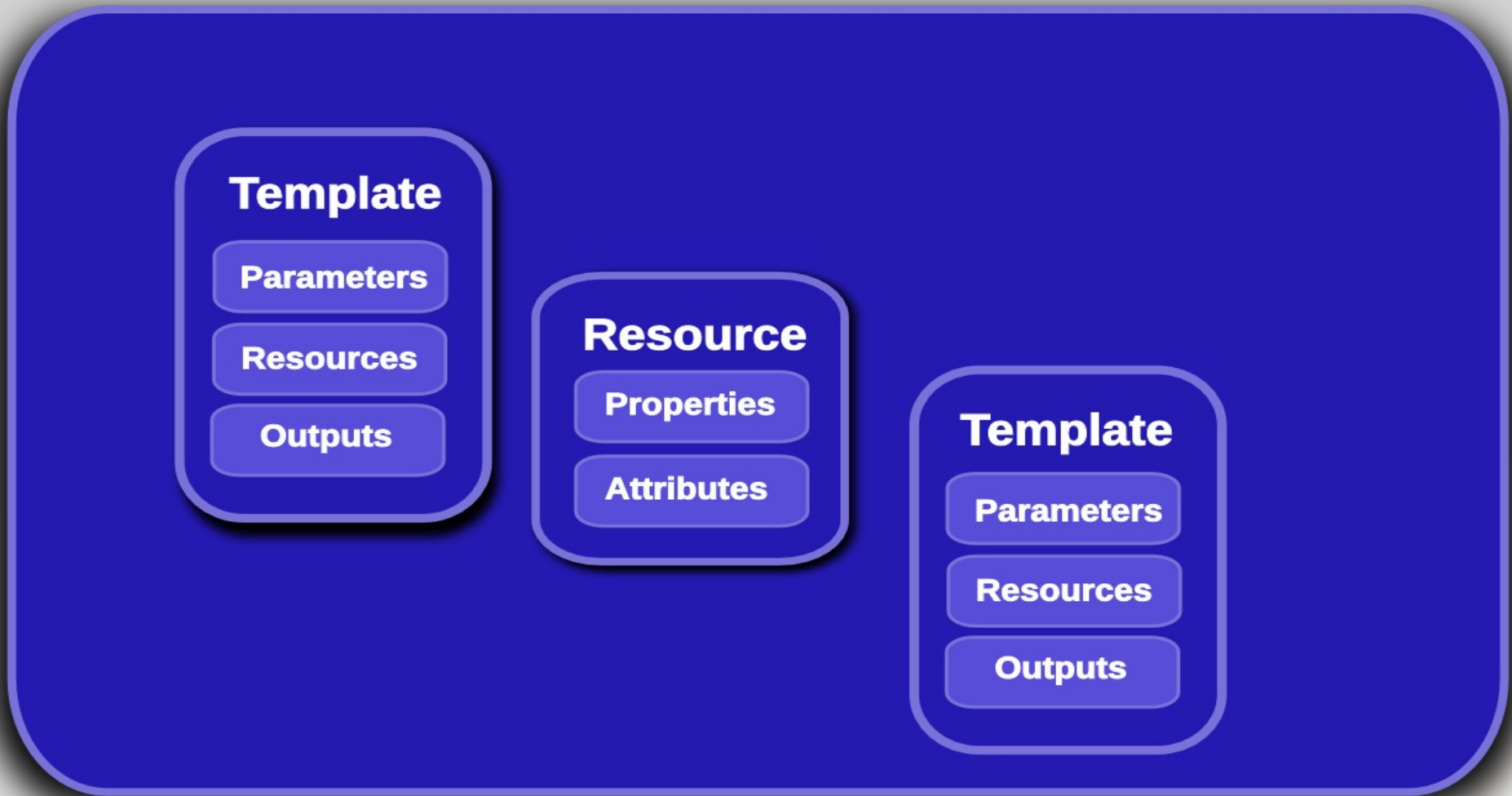
```
      - range: {min: 1, max: 10}
```



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`
- https://github.com/hardys/demo_templates

Heat Nested Stack Templates





Nested Stack Example

```
(my_nested.yaml)

heat_template_version: 2013-05-23

resources:

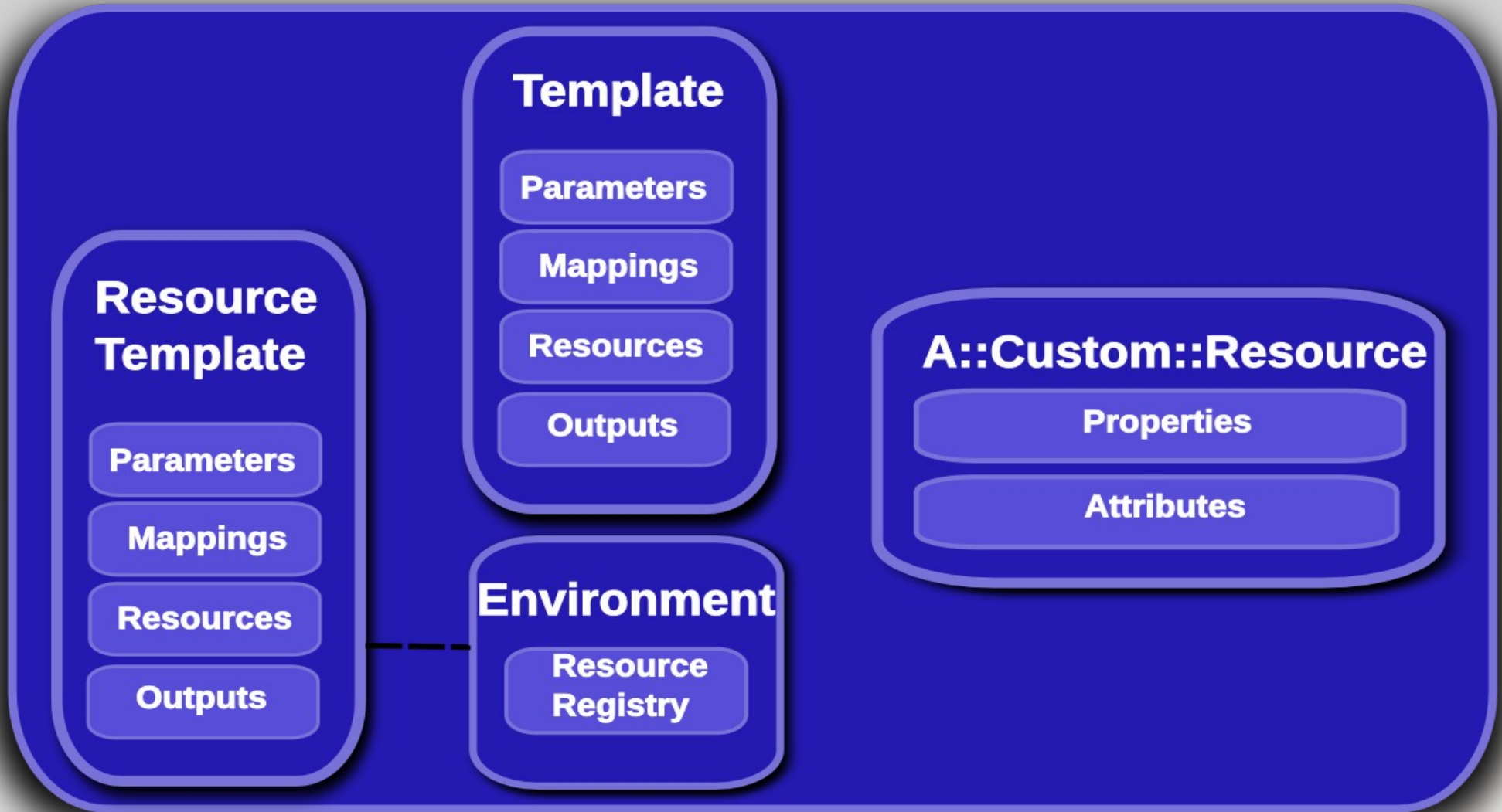
  my_instance:
    type: OS::Nova::Server
    properties:
      flavor: m1.small
      image: my_image

heat_template_version: 2013-05-23

resources:

  my_nested:
    type: my_nested.yaml
```

Provider Resources





Provider Resources

- No hard-coded names/paths (in the template)
- Staging workflow/testing much simplified
- Allows deployer **or user** to define custom resource types
 - /etc/heat/environment.d
 - /etc/heat/templates
 - Users heat stack-create -environment-file=foo.yaml
 - Users can override default deployer resources!

resource_registry:

"My::Custom::Server": server.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`



Provider Resource Example

(my_nested.yaml)

```
heat_template_version: 2013-05-23
```

```
resources:
```

```
  my_instance:
```

```
    type: OS::Nova::Server
```

```
    properties:
```

```
      flavor: m1.small
```

```
      image: my_image
```

(my_stack.yaml)

```
heat_template_version: 2013-05-23
```

```
resources:
```

```
  my_nested:
```

```
    type: My::Custom::Server
```

(environment.yaml)

```
resource_registry:
```

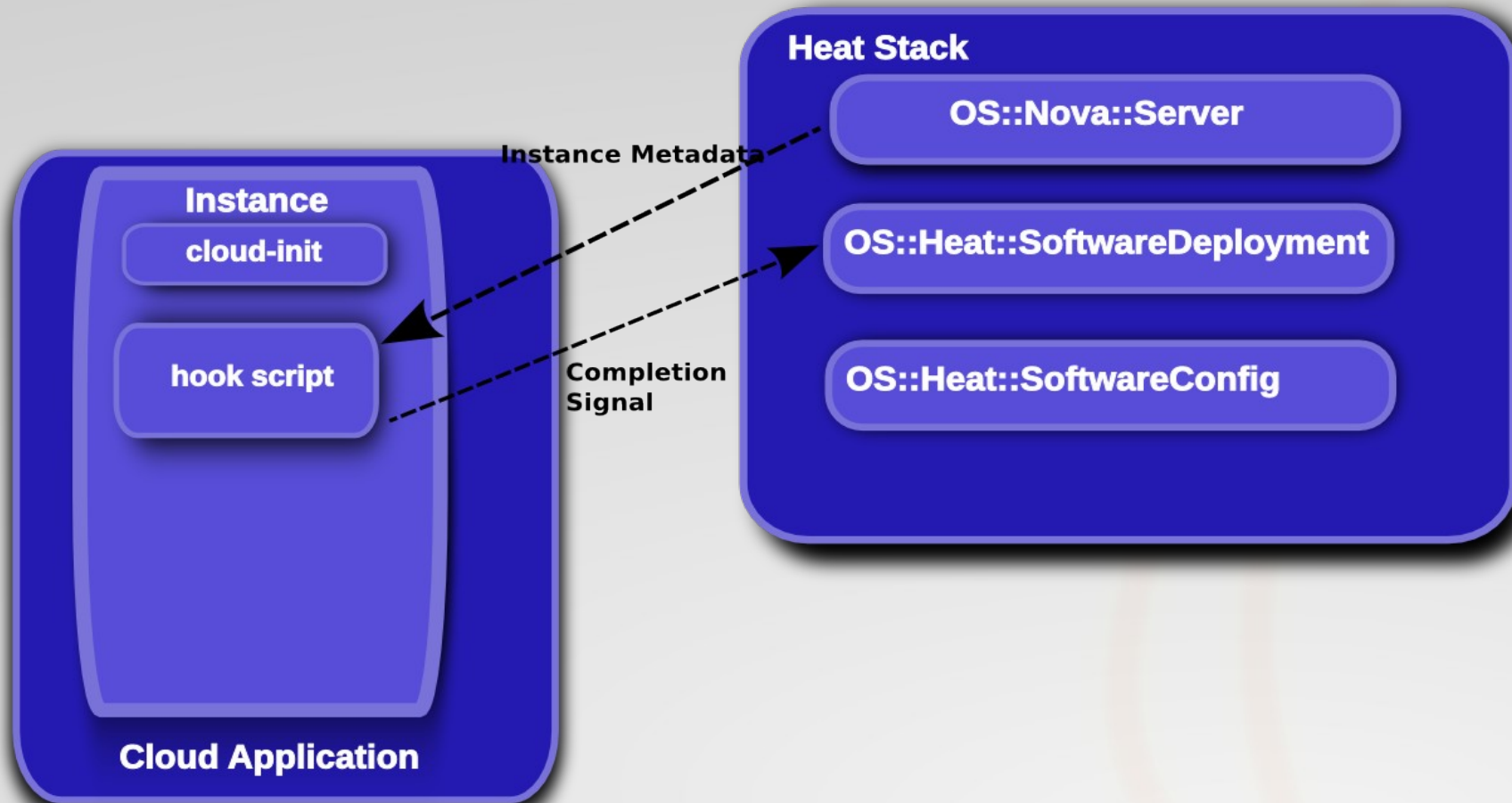
```
  My::Custom::Server: my_nested.yaml
```

Software Config



Tuesday, May 13 • 3:40pm – 4:20pm

“Application Software Configuration Using Heat”





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 (tbc!)

- Autoscaling hooks (scale-down cleanup)
- Autoscaling parameters (choose victims)
- Enable retry from failed states
- Rolling updates
- Stack check
- Stack preview
- Cancel stack update
- Update preview
- ...



Questions?

- <https://wiki.openstack.org/wiki/Heat>
- <http://docs.openstack.org/developer/heat/>
- <https://github.com/hardys/presentations>