



WOMBATOAM

STOCKHOLM, JUNE 12TH 2013



Middleware layer capable of dynamically deploying, managing and monitoring a distributed **Erlang** application on a **heterogeneous** virtual infrastructure, based on a set of user-specified **deployment demands**.

HETEROGENEITY



cloudstack
open source cloud computing



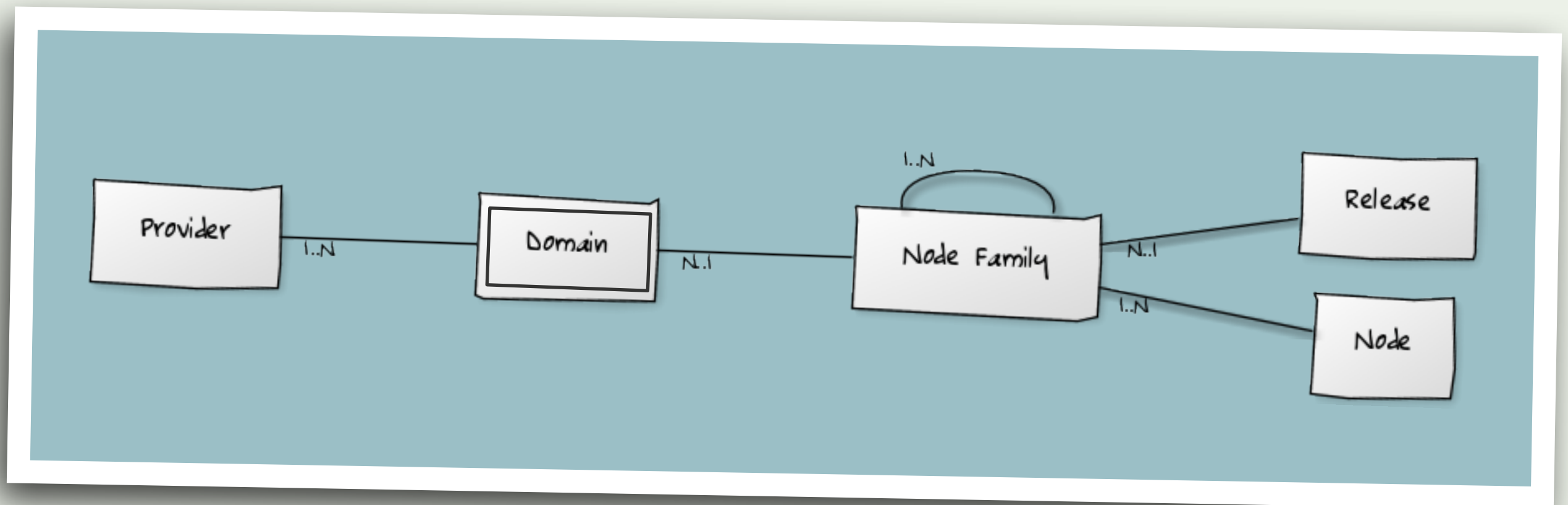
OpenNebula.org

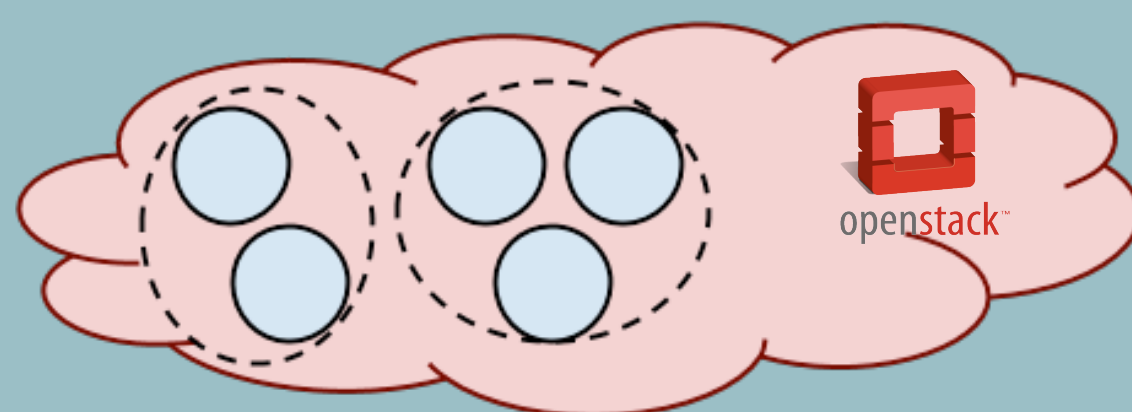
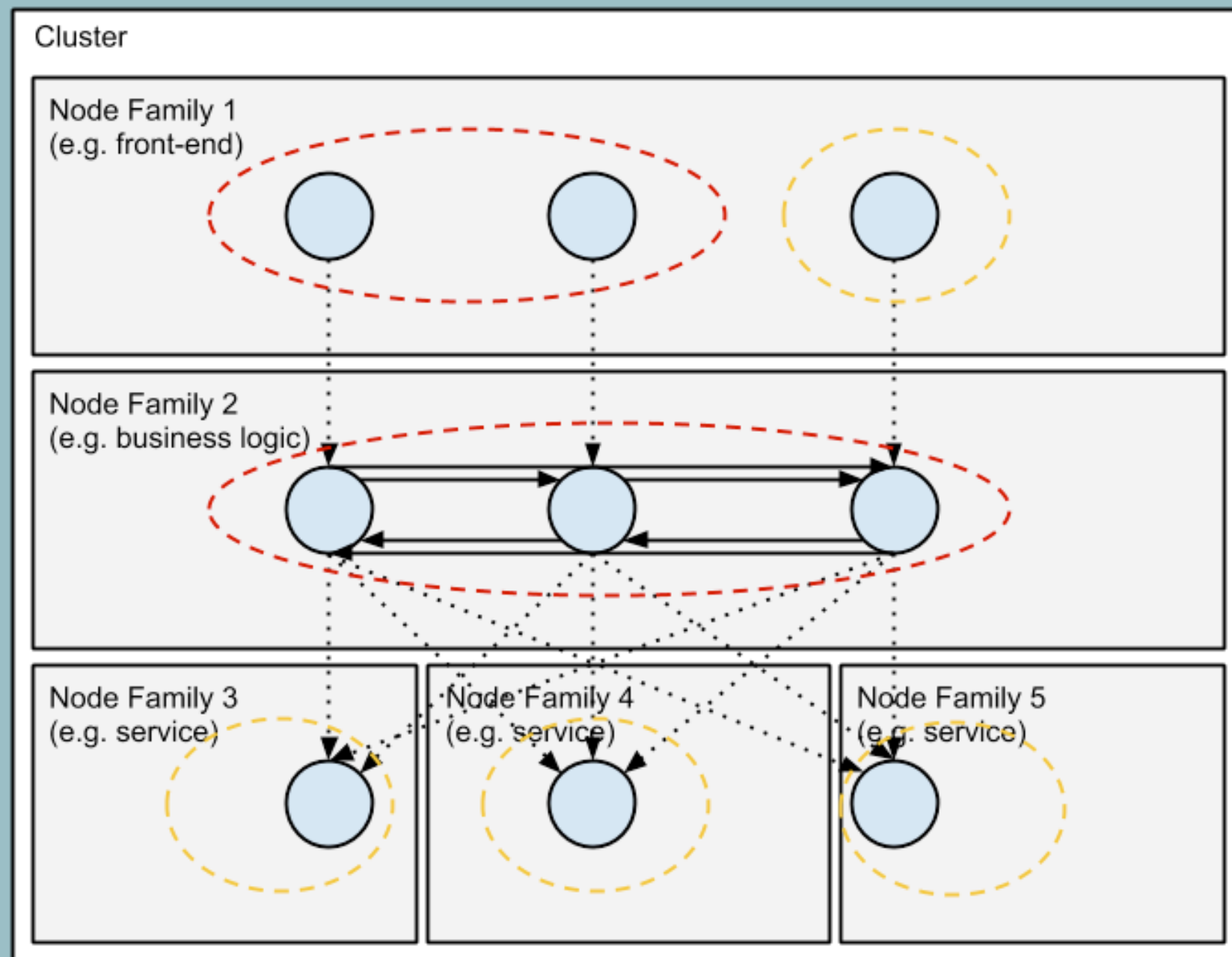


~~$\Theta(N)$~~ ? $O(1)$!

δ .CLOUD

- **CROSS-PROVIDER** DEPLOYMENT.
- **TRANSPARENT** TO THE USER.





Private Cloud (OpenStack)



Public Cloud (EC2)

DYNAMIC DEPLOYMENT

*Match (node) **deployment demands** against the **capabilities** of those available (deployment) domains.*

- **CO-LOCATION** OF NODES
- **GEOGRAPHICAL** CONSTRAINTS
- **LOAD BALANCE** ACROSS PROVIDERS
- PROVIDER **CONSOLIDATION**

REST API

- REGISTER **INFRASTRUCTURE PROVIDERS**
- UPLOAD **RELEASES**
- DEFINE **NODE FAMILIES**
- SPECIFY **INTER/INTRA NODE FAMILY CONNECTIVITY**
- **SPAWN NODES** WITHIN NODE FAMILIES
- **START/STOP** NODES (NODE FAMILIES, EVEN CLUSTERS)
- RUN **APP-SPECIFIC COMMANDS** ON NODES (NODE FAMILIES)

DEMO

POST /providers

```
{ "provider":  
  {  
    "name": "EC2",  
    "description": "ESL's Amazon EC2 Account",  
    "username": <EC2AccessKey>,  
    "password": <EC2SecretKey>,  
    "endpoint": "http://localhost:3001/api/"  
  }  
}
```

POST /releases

```
{ "release":  
  {  
    "name": "Riak 1.3.1",  
    "description": "Riak release",  
    "tarball": `base64 riak-1.3.1.tar.gz`  
  }  
}
```

POST /node_families

```
{ "node_family":  
  {  
    "name": "Riak",  
    "description": "Riak",  
    "release_id": <ReleaseUUID>,  
    "clustering_strategy": {  
      "node_selection": "random",  
      "strategy": "custom",  
      "opts": [{ "cmd": "bin/riak-admin cluster join" }]  
    },  
    "neighbors": [],  
    "domains": [{  
      "provider_id": <ProviderUUID>,  
      "hw_profile": "m1.medium",  
      "virtual_disk": "ami-foobar",  
      "ssh_username": "ubuntu" }]  
    },  
    "firewall": [  
      { "protocol": "tcp",  
        "port_from": 8096,  
        "port_to": 8099 },  
      { "protocol": "tcp",  
        "port_from": 6000,  
        "port_to": 7999 }]  
    }  
  }  
}
```

POST /node_families/:nodefamily_uuid/nodes
{ "amount": 2 }

POST /node_families/:nodefamily_uuid/nodes/start









Cluster Management

Join Nodes

Type a node name or list of names separated by commas.

ADD NODES

Node List (2 Nodes Total)

Status	Name	Actions	Partitions	RAM Use
 Valid	riak-6b8403ea-932d-4596-a0e7-0d7c032c3a26@ec2-75-101-254-38.compute-1.amazonaws.com		 0%	 97% Free
 Valid	riak-98c24f48-a52d-4de5-83f2-a5bc9870ebfe@ec2-23-20-42-205.compute-1.amazonaws.com	HIDE SHOW	 100%	 95% Free



ROADMAP

- **DYNAMIC DEPLOYMENT** STRATEGIES
- **1-CLICK** SERVICE DEPLOYMENT
- **MONITORING** DEPLOYED NODES
 - **ERLANG VM** METRICS
 - **APP-SPECIFIC** METRICS
- MANAGEMENT **WEB-DASHBOARD**
- **INTEGRATION** WITH EXISTING O&M TOOLS

QUESTIONS?

BACKUP SLIDES

RELEASE (EU FP7 STREP PROJECT)

*To scale the radical **concurrency-oriented** programming paradigm to build reliable general-purpose software on **massively parallel** machines.*

RELEASE Statement of Aims, 2011



UPPSALA
UNIVERSITET



ERICSSON



Erlang
SOLUTIONS