

Interactive Visual Orchestration With Curvature and Donabe

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Mentors:

Debo Dutta

Lew Tucker

- Office of the Cloud CTO
- OpenStack Summit April 2013 - Portland

Curvature and Donabe - Agenda



- How did we get here?
- What is Curvature?
- What is Donabe?
- Questions?



Speaker Background

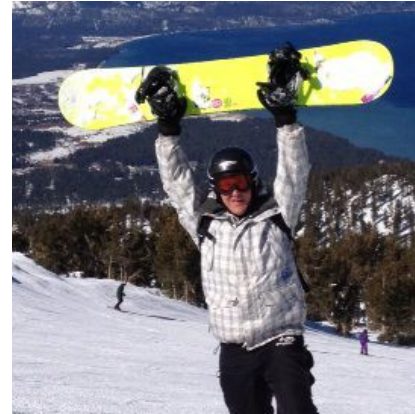
- Software Engineering Interns in the Office of the Cloud CTO



Sam Betts



John Davidge



Jack Fletcher



Bradley Jones

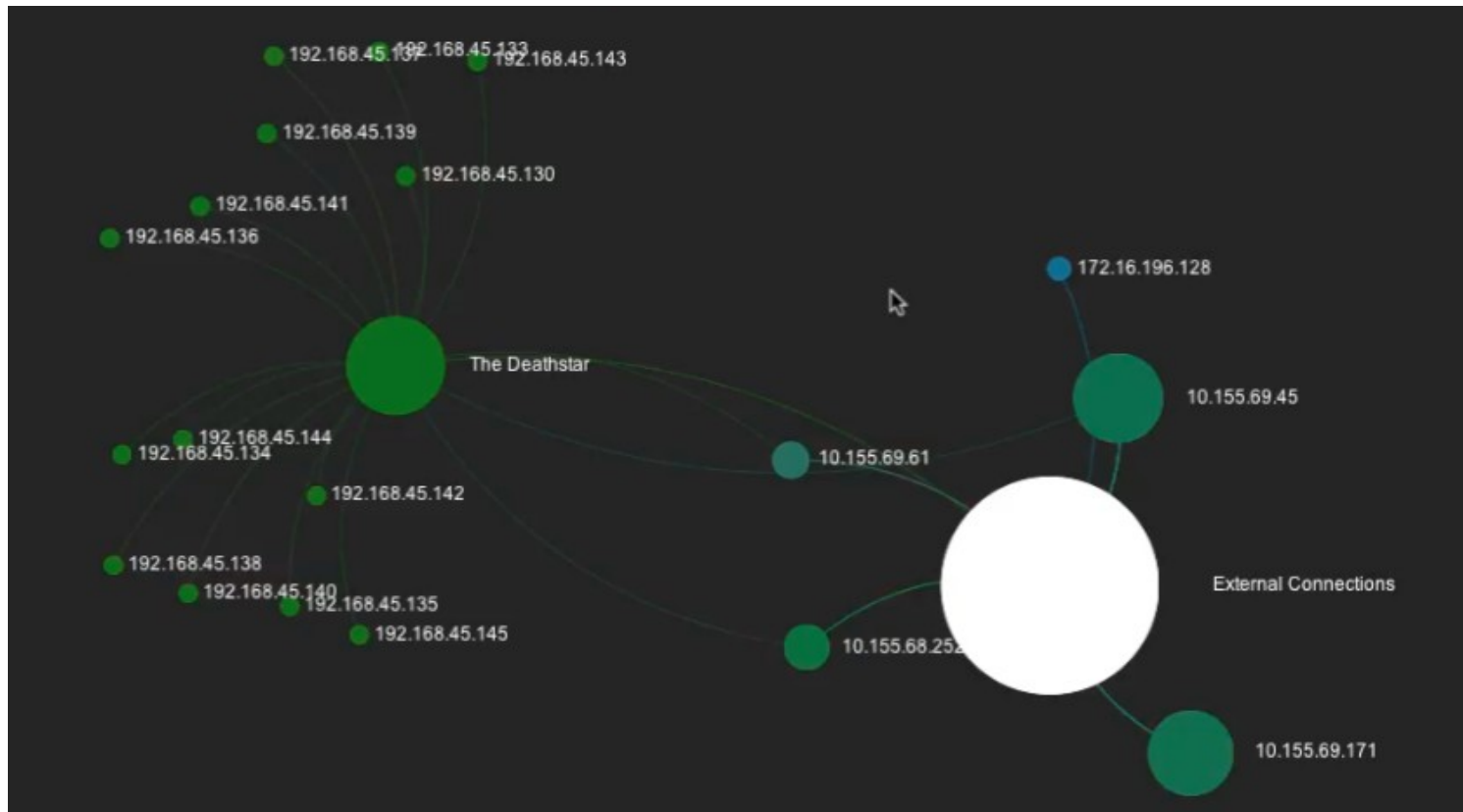
- Computer Science Undergraduates
- University of Kent, Canterbury, UK

University of
Kent



Curvature - Concept Work

- Early exploration of virtual network visualization



Curvature - Concept Work



- Even basic visualization can be very powerful for understanding your virtual network
- A system that can represent a virtual network visually and communicate it to the user is the first step
- What if we can make this work both ways?



How do users interact with clouds?



Amazon EC2

The screenshot shows the Amazon EC2 console interface. At the top, there's a navigation bar with 'Services', 'Edit', and user information. Below that, a 'Launch Instance' button is visible. The main area displays a table of instances. The table has columns for Name, Instance, AMI ID, Root Device, Type, State, Status Checks, Alarm Status, Monitoring, Security Groups, Key Pair Name, Virtualization, and Placement Group. One instance is listed: 'WebServer' with AMI ID 'ami-d70c2692', root device 'ebs', type 't1.micro', state 'running', and various other attributes. Below the table, a message states 'No EC2 instances selected.' and 'Select an instance above'. A 'Feedback' link is at the bottom right.

Name	Instance	AMI ID	Root Device	Type	State	Status Checks	Alarm Status	Monitoring	Security Groups	Key Pair Name	Virtualization	Placement Group
WebServer	h7m250e	ami-d70c2692	ebs	t1.micro	running	2/2 checks p	none	basic	quick-start-1	webserver	paravirtual	

OpenStack Horizon

The screenshot shows the OpenStack Horizon dashboard. The top right corner indicates 'Logged in as: demo' with 'Settings' and 'Sign Out' links. The main heading is 'Instances'. Below it, there are 'Launch Instance' and 'Terminate Instances' buttons. A table lists instances with columns for Instance Name, IP Address, Size, Keypair, Status, Task, Power State, and Actions. One instance is shown: 'WebServer' with IP address '52.227.224.3', size 'm1.tiny | 512MB RAM | 1 VCPU | 0 Disk', and status 'Active'. Below the table, it says 'Displaying 1 item'. On the left side, there's a navigation menu with 'Project' (CURRENT PROJECT: demo), 'Manage Compute' (Overview, Instances), 'Volumes', 'Images & Snapshots', 'Access & Security', and 'Networks'.

Instance Name	IP Address	Size	Keypair	Status	Task	Power State	Actions
WebServer	52.227.224.3	m1.tiny 512MB RAM 1 VCPU 0 Disk	-	Active	None	Running	Create Snapshot



Curvature & Donabe



- Two services, one philosophy:

Make OpenStack Easier to Use



Projects Networks View Images Containers About Current Project - demo Logout

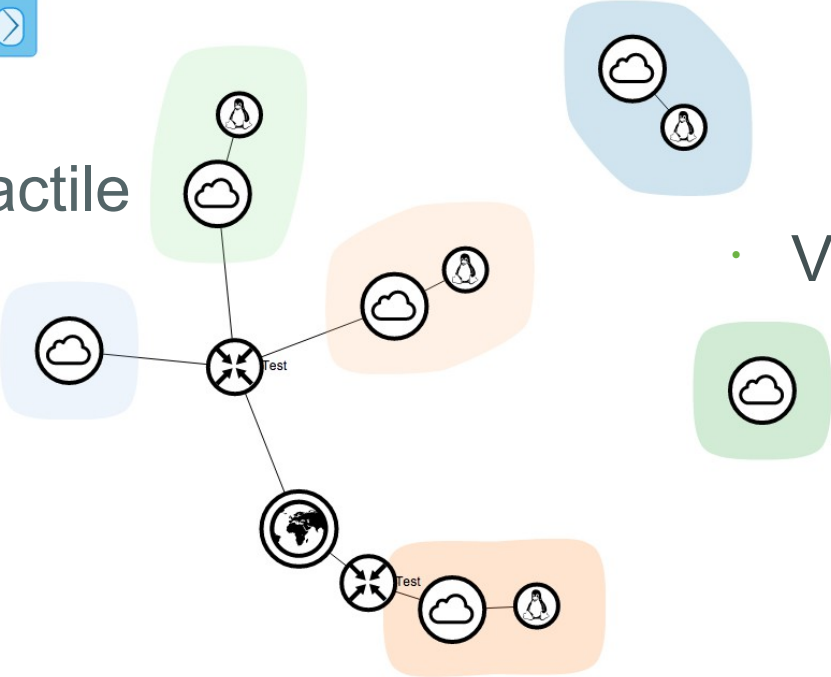
Instances Used : 4/1000 CPUs Used : 4/20 RAM Used : 2048MB/51200MB

Tools Images Network Containers Volumes

◀ ◀> Link 🗑️ Remove ▶

Deploy

- Interactive / Tactile
- Visual / Logical
- Extensible / Adaptable



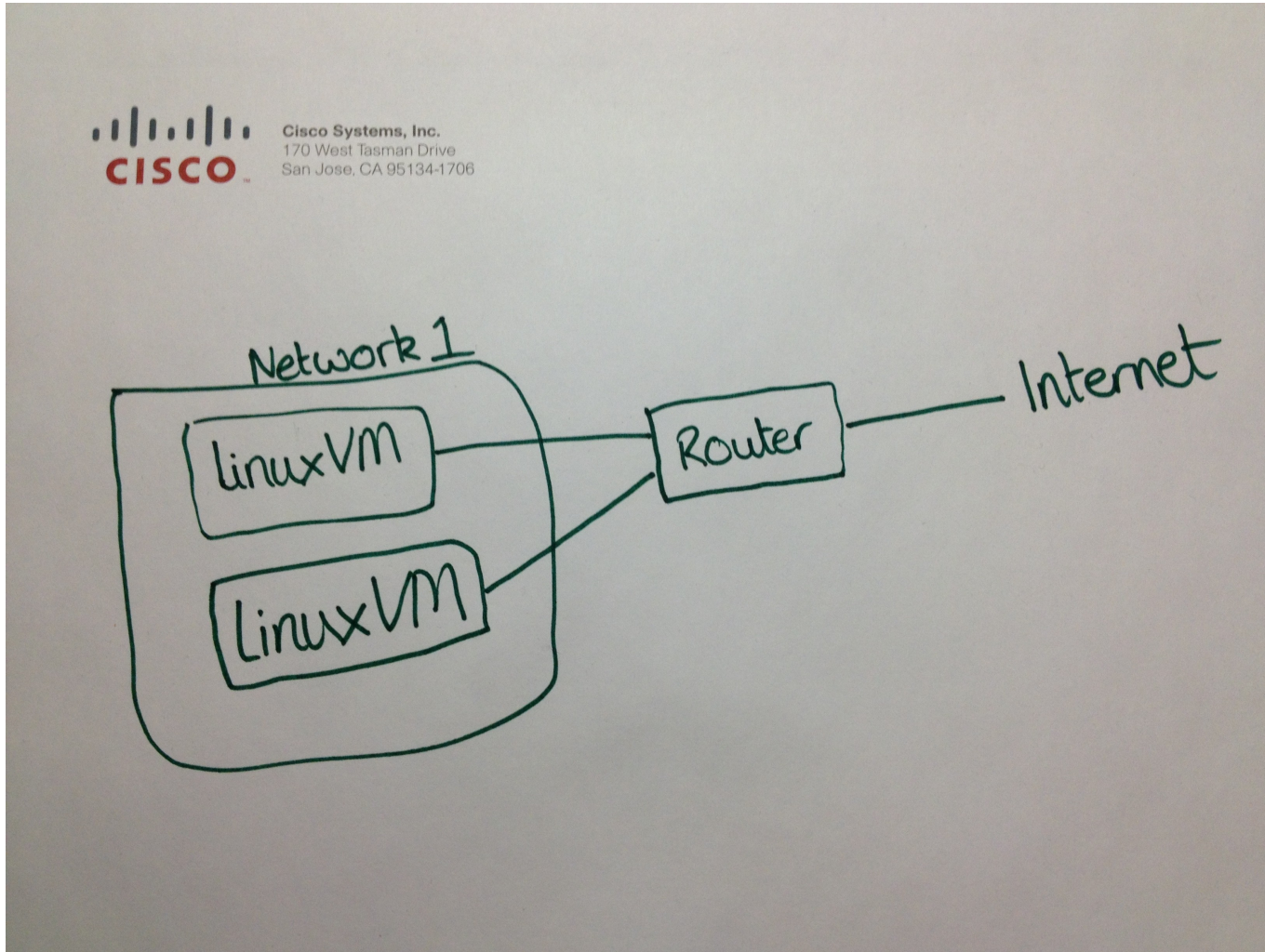
Demo

Insert photo here

Curvature



Curvature



Curvature – Lessons Learned



- Visual network design turned out to be a great success in user trials within Cisco
- People using Curvature to interact with Quantum for the first time just *got it* – it took away the mystery of Horizon or the CLI
- Building complex application topologies became a trivial task. A need to exploit this by making these topologies repeatable was identified

Donabe - Origins



- First proposed at the Essex summit in 2011 by Debo Dutta and Rick Clark
- <https://wiki.openstack.org/wiki/Donabe>
- Defines a system of application ‘containers’ that describe the virtual topology of an application



Donabe – Container Structure



- A container can have zero to many
 - Routers (Quantum)
 - Networks (Quantum)
 - Virtual Machines (Nova)
 - Containers (Donabe)



Donabe – Container Structure



- Endpoints
 - Any node within a container can be defined as an endpoint
 - Allows connectivity to nodes outside the container



Donabe



- Completely separate from Curvature
- Interaction via REST API



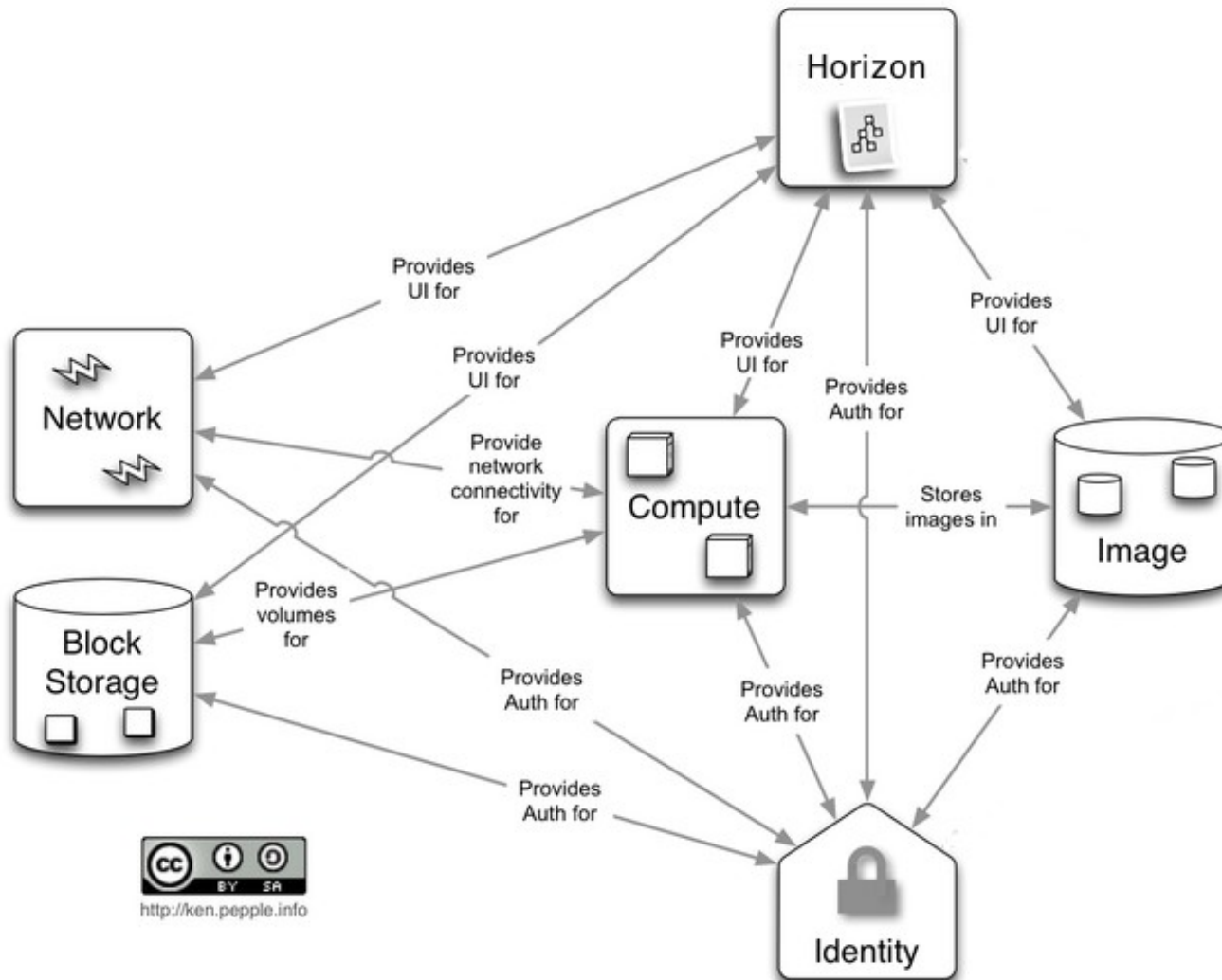
Demo

Insert photo here

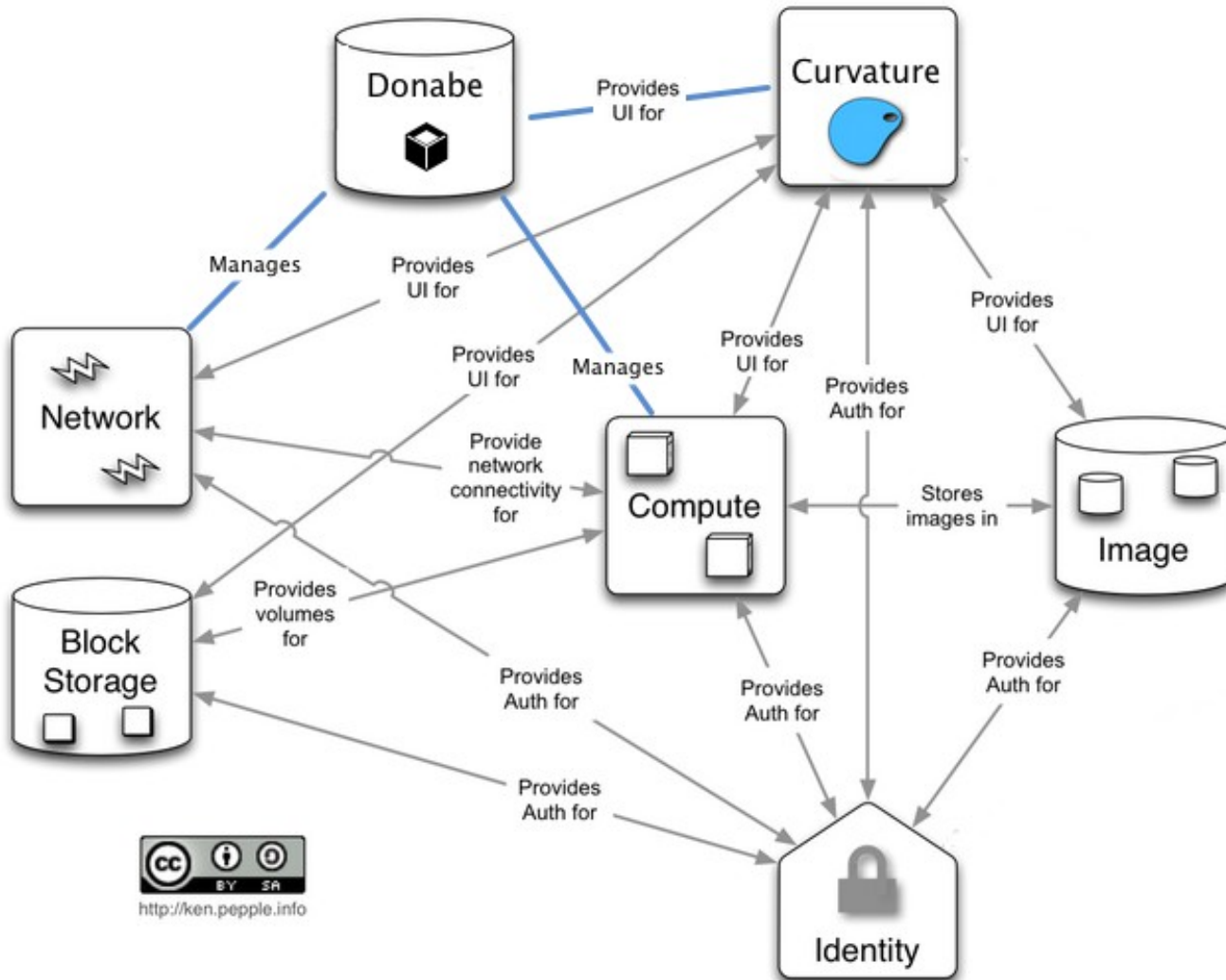
Curvature with Donabe



Current Conceptual Architecture



New Conceptual Architecture



Planned Features



- Curvature
 - Saving & Sharing Network Designs
- Donabe
 - Modification of live containers
- Meta-data Service



In Summary



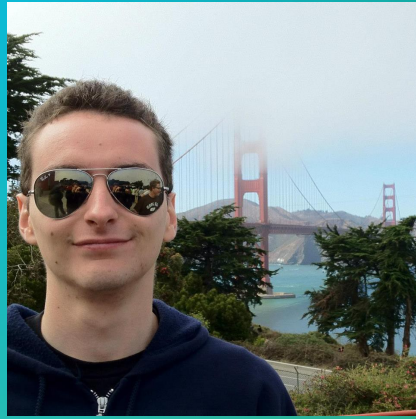
- Curvature
 - Designed to be extensible
- Donabe
 - Designed to work with services like Curvature via REST API
- To be open-sourced soon





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Thank you

