



# The Emerging Multicloud World

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**Build Together:** Kubernetes for Your Multicloud World

Cisco at KubeCon 2018 • December 11-13 • Seattle, WA

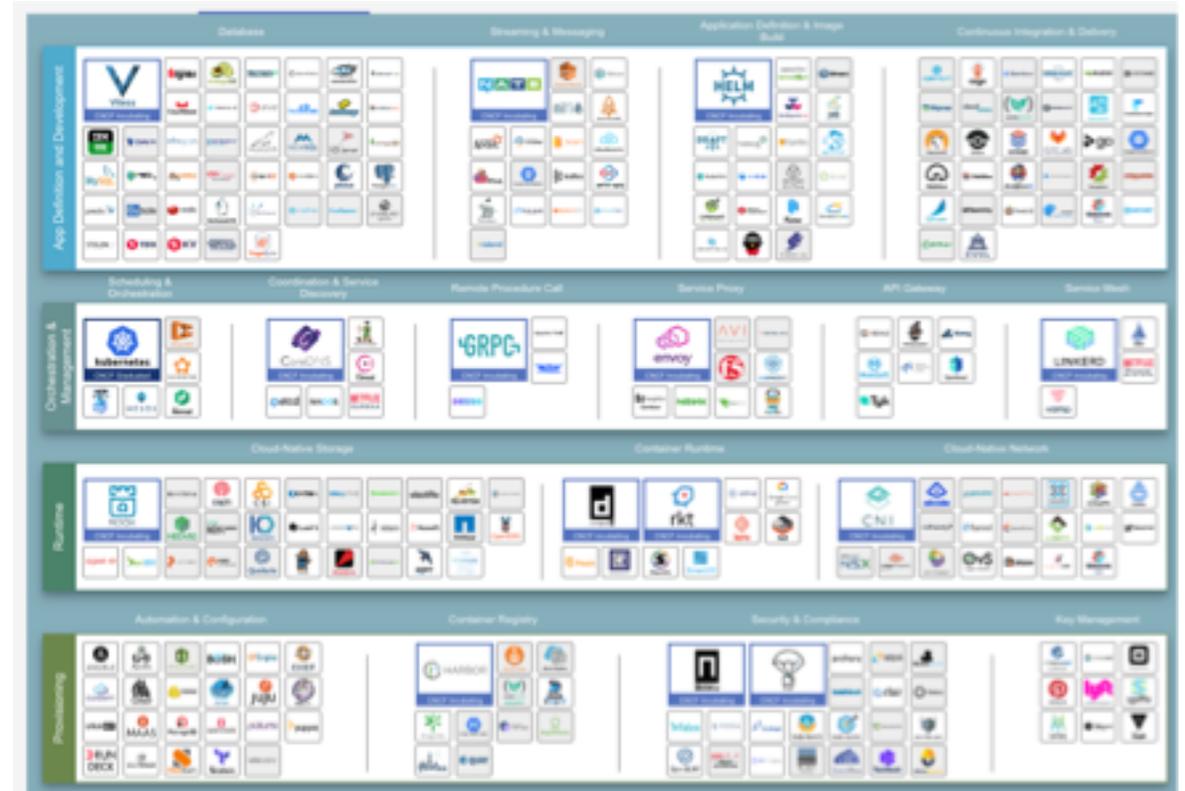


# Abstractions, platforms, and the Internet

- The Internet today is clearly the most important platform driving innovation
  - Where computing happens and businesses are disrupted
  - Cloud computing has revolutionized IT infrastructure
- APIs abstract away complexity – allowing developers to focus on features
  - Have layers, stacks, platforms, and services
  - Software and developers rule
- Impact: new apps and services at an ever faster rate

## CNCF Cloud Native Interactive Landscape

We've entered the Golden Age of open source software



Software collaboration is happening at a global scale

# GitHub: 95 Million Repositories: 31 Million Developers



CiscoCloud / mantl

Watch 225 Star 2,188 Fork 300

Code Issues 118 Pull requests 41 Wiki Pulse Graphs

Mantl is a modern platform for rapidly deploying globally distributed services <http://mantl.io>

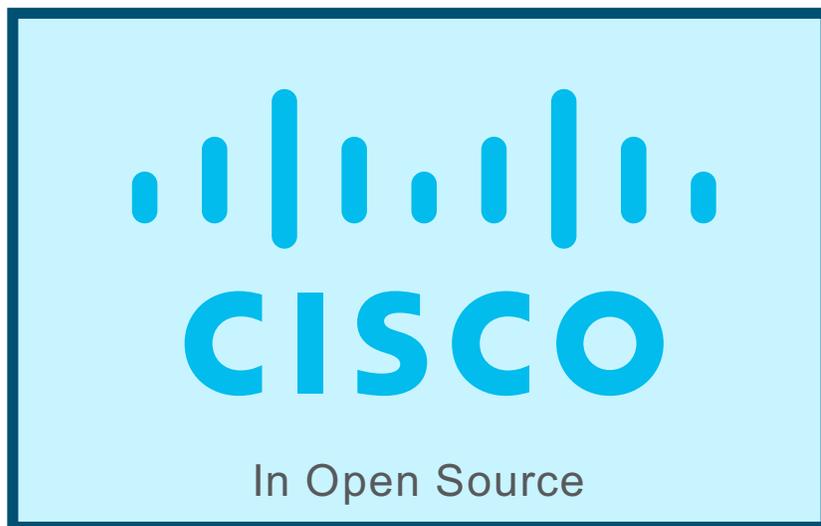
2,698 commits 54 branches 26 releases 64 contributors

Branch: master New pull request

New file Find file HTTPS https://github.com/CiscoC Download ZIP

ryane Merge pull request #1251 from CiscoCloud/feature/collectd-addon Latest commit 7b876b9 5 days ago

.github	pull request template: remove rebase requirement	a month ago
addons	addons: move collectd to an addon	8 days ago
docs	Kubernetes by default	10 days ago
examples	Examples/spark	10 days ago
group_vars/all	Kubernetes by default	10 days ago



# Configuration and Cabling Becomes Code

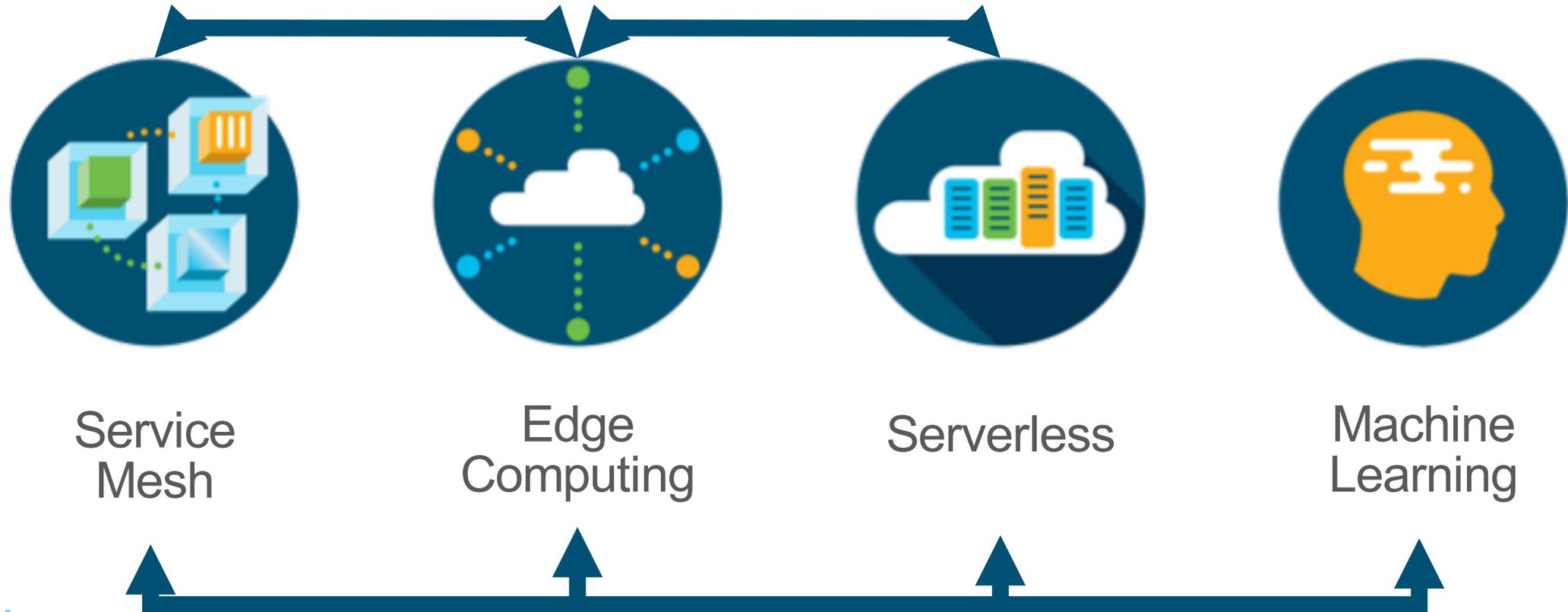
Automation and declarative models replace manual procedures

```
submodule execd-routes {
  import inet-types { prefix inet; }
  include execd-types;

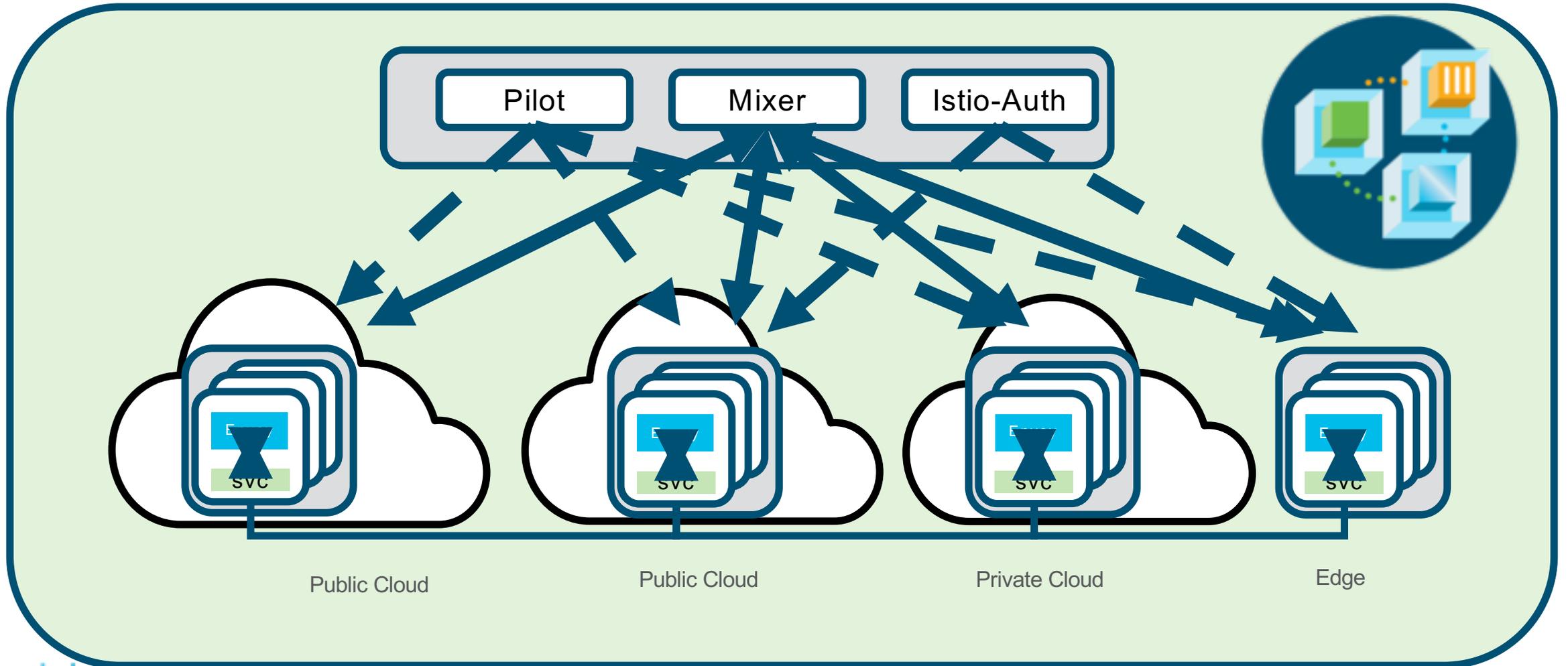
  description
    "providesfor configuring static routes
    (IPv4 and IPv6).

  grouping routes {
    container inet {
      list route {
        key "name prefix-length";
        leaf name {
          type inet:ipv4-address;
        }
        leaf prefix-length {
          type prefixLengthIPv4;
        }
        leaf enabled {
          type boolean;
          default true;
        }
      }
    }
  }
}
```

# New application development and delivery models

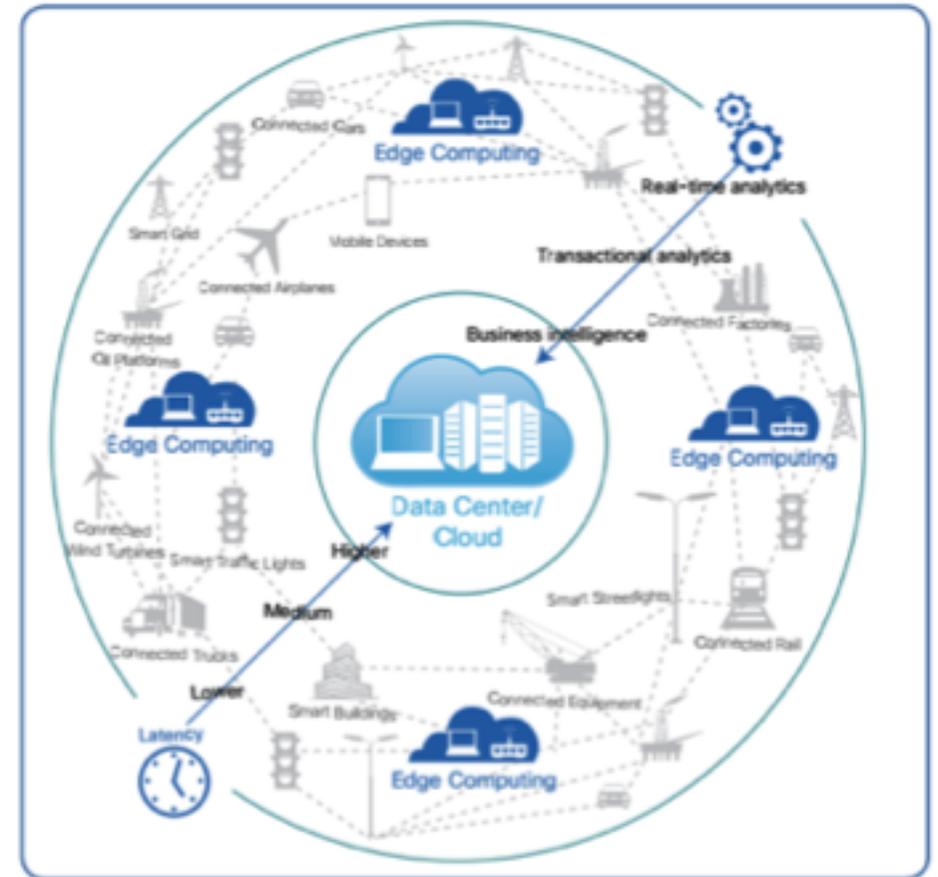


# Service mesh stitches together services with security and telemetry



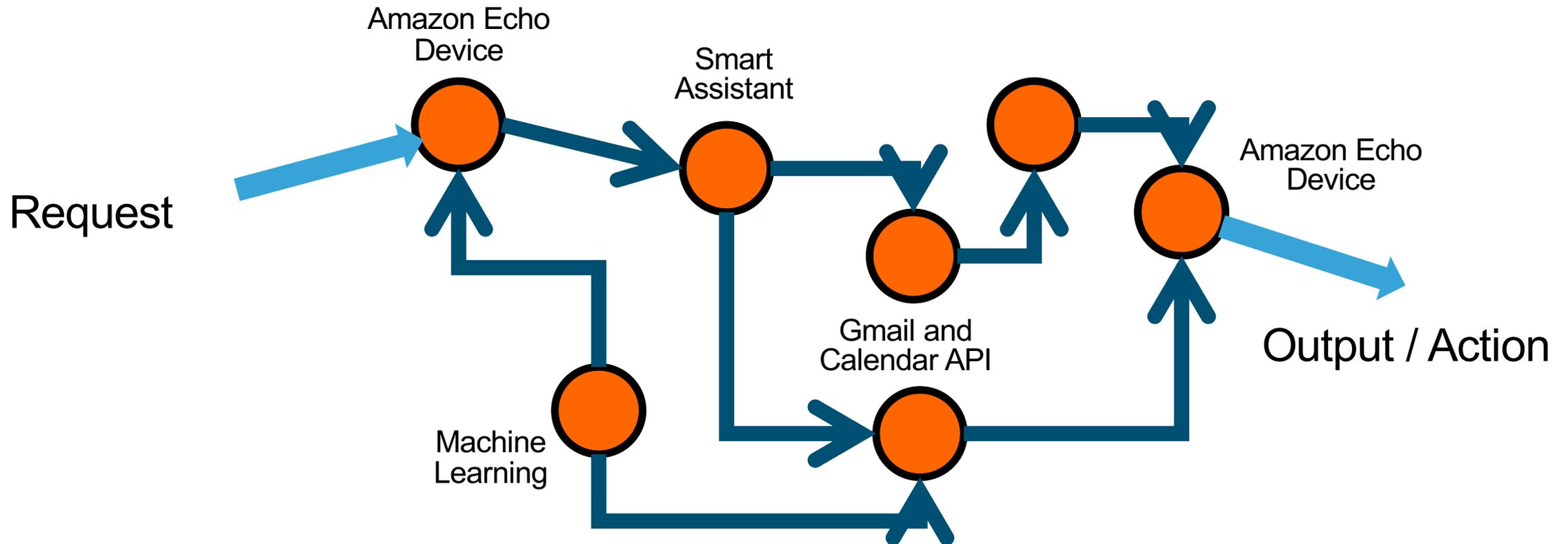
# Computing is moving to the edge

- Latency-sensitive workloads
- 1,000's of resource-constrained devices
- Unreliable connectivity
- Remote management / provisioning
- Real-time analytics and security



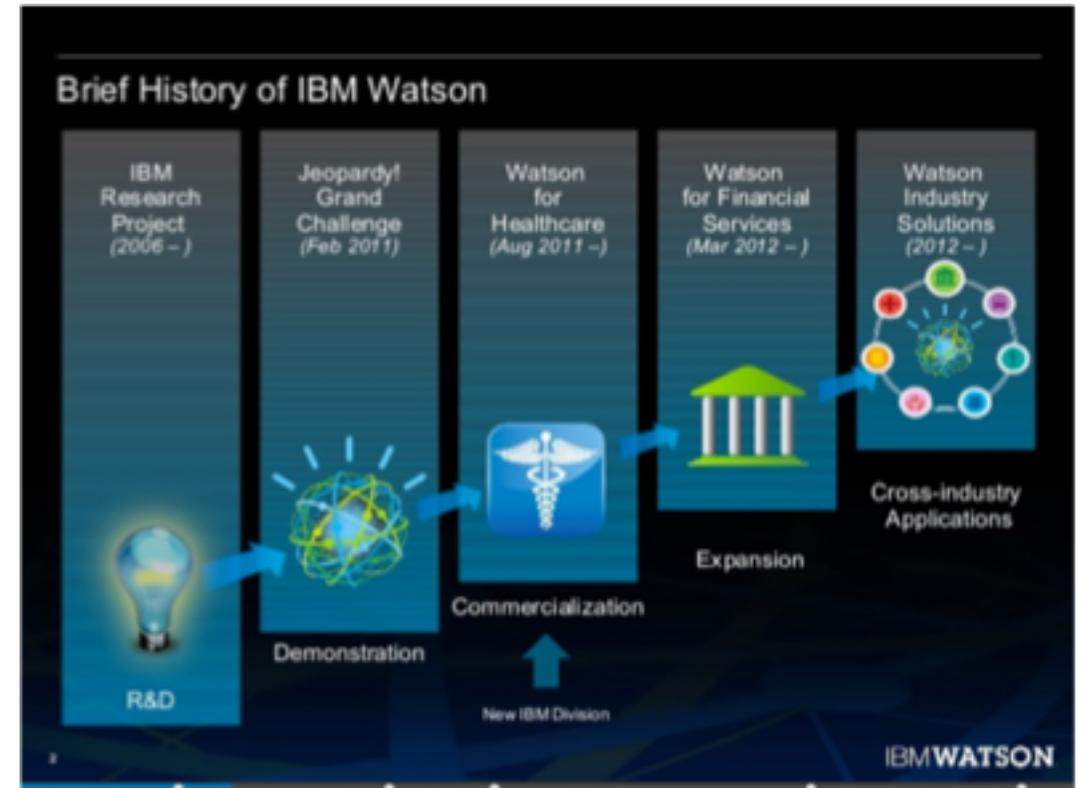
Source: Cisco, 2014

“Serverless,” function-as-a-service paradigms connect services across multiple clouds – lambda, Knative...



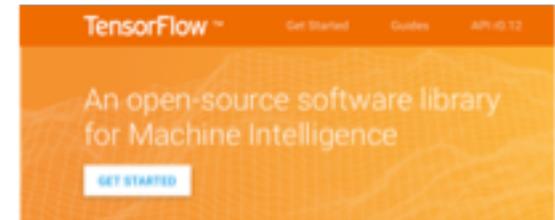
The location of these components is abstracted away

# The long AI winter is finally over



# Learn AI online – Make ML/AI accessible to all

Tinker With a **Neural Network** Right Here in Your Browser.  
Don't Worry, You Can't Break It. We Promise.



Iterations: 000,116

Learning rate: 0.03

Activation: Tanh

Regularization: None

Regularization rate: 0

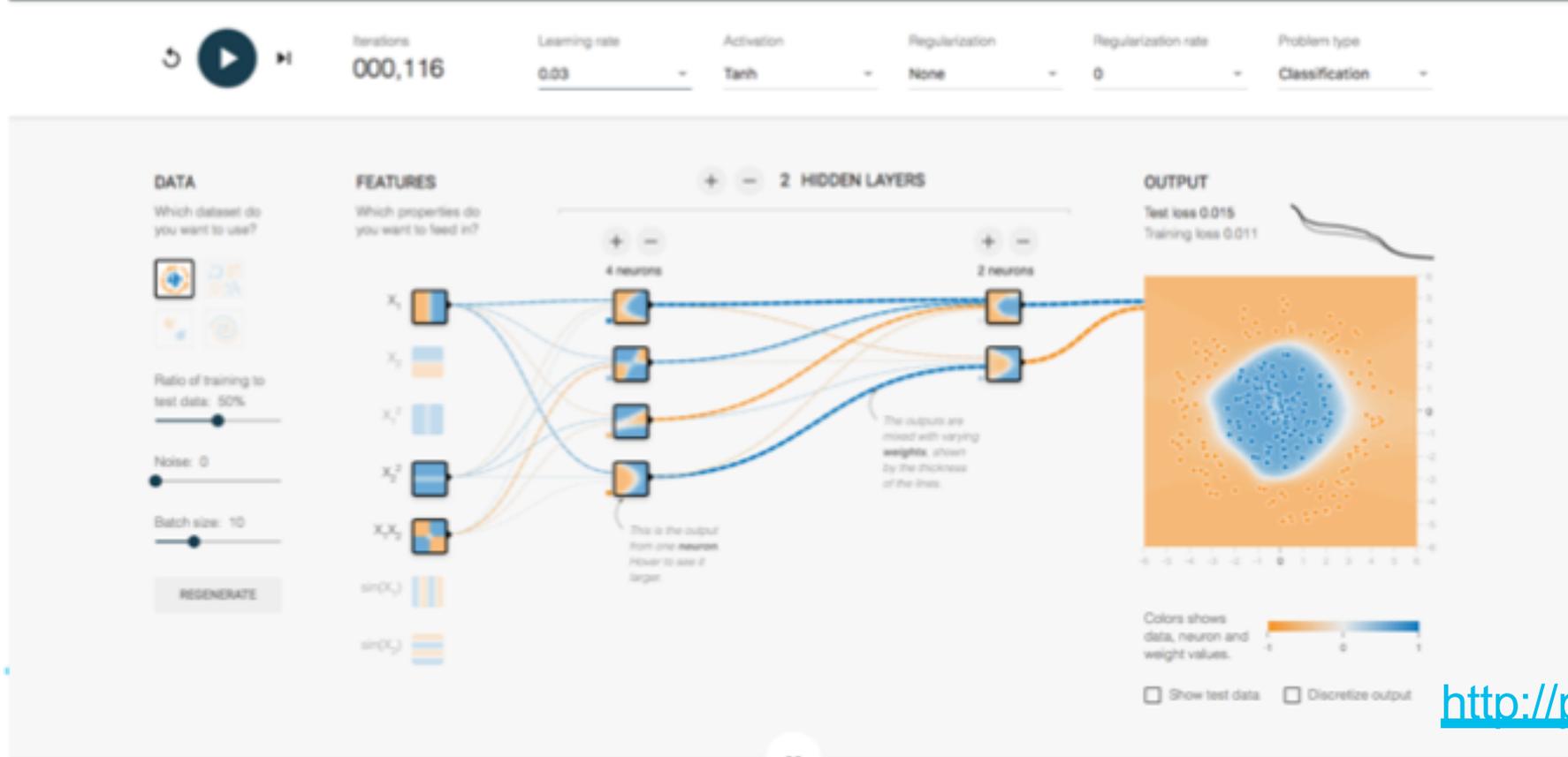
Problem type: Classification

**DATA**  
Which dataset do you want to use?  
Ratio of training to test data: 50%  
Noise: 0  
Batch size: 10  
REGENERATE

**FEATURES**  
Which properties do you want to feed in?  
 $X_1$   
 $X_2$   
 $X_1^2$   
 $X_2^2$   
 $X_1 X_2$   
 $\sin(X_1)$   
 $\sin(X_2)$

**2 HIDDEN LAYERS**  
4 neurons  
2 neurons  
The outputs are mixed with varying weights, shown by the thickness of the lines.  
This is the output from one neuron. Hover to see it larger.

**OUTPUT**  
Test loss 0.015  
Training loss 0.011  
Colors shows data, neuron and weight values.  
 Show test data  Discretize output



<http://playground.tensorflow.org/>

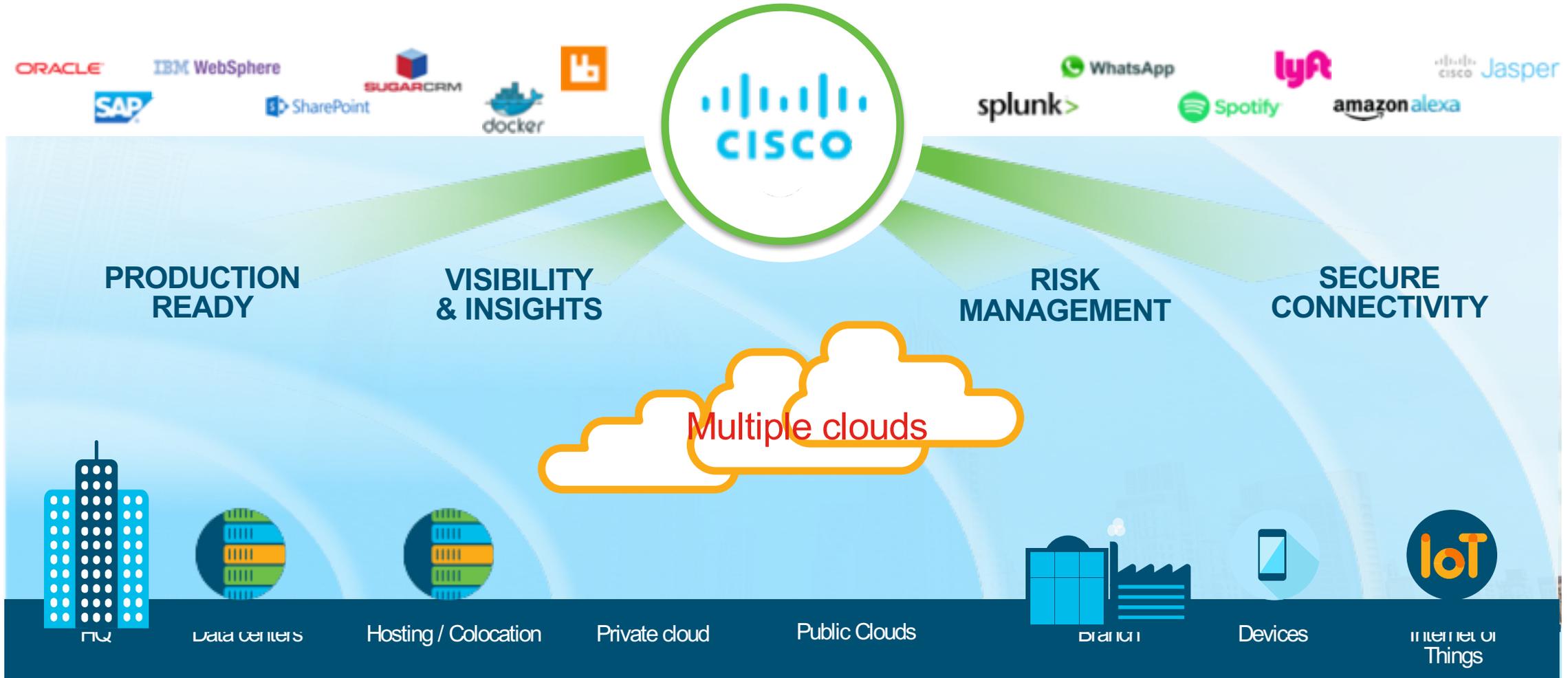
# Changing the way we think about development

Bring application development closer to ***assembly*** of proven, highly-scalable services running anywhere from the edge to the cloud.



Code  Assembly of services

# Come see a multicloud world made possible



Thank you!

