Perspectives on the Edge Cloud

Panel Discussion
Moderated by Larry Peterson, ONF
Panelists

John Dilley  
Chief Architect  
Rafay Systems

Wiqar Chaudry  
COO  
NALEJ

Zack Butcher  
Founding Engineer  
Tetrate
Edge Cloud: Where the Hype Is

The Edge Will Eat the Cloud
John Bittman, Gartner Blog Network

Return to the Edge and the End of Cloud Computing
Peter Levine, Andreessen Horowitz
Collision Course

Opportunity!

Network Operators (Access Network)

Disaggregation
Commodity
Software-Defined

Low Latency
High Bandwidth
Massive Scale

Cloud Providers (Datacenters)
Convergence

ONF: Multi-Access-Edge Cloud

Cloud Providers (Datacenters)

Disaggregation
Commodity
Software-Defined

Low Latency
High Bandwidth
Autonomy

Democratizing the Network Edge
SIGCOMM CCR, April 2019
Create Value

Three Startups

Cloud Providers (Datacenters)

Network Operators (Access Network)

Disaggregation
Commodity
Software-Defined

Low Latency
High Bandwidth
Autonomy
John Dilley, Chief Architect
Rafay Systems
Convergence: MEC to Cloud

- IoT/end user device → 5G MEC
  - “access meets edge” (cloud)
- MEC → Internet edge
  - Scalable compute resource (CPU, RAM, TPU...)
- Internet edge → Public cloud
  - Stable, reliable compute, storage, and services
A funny thing happened...

- ...on the way to edge cloud
  - Container distribution and placement
  - In-cluster scheduling and orchestration
  - Infrastructure and platform abstraction

- Edge cloud depends on *app lifecycle management*
  - Network operators that solve for this win more apps
App Lifecycle Management

- On “Day 1” you get the app running
  - Infrastructure setup, application distribution
- Lifecycle management happens every day after
  - Configuration updates
  - Container updates (patches, features)
  - Ongoing monitoring and tuning
- More on ALM in my talk after lunch
UNIFIED RESOURCE & APP LIFECYCLE MANAGEMENT

IoT  Cloud  Everything Else
INFRASTRUCTURE IS EVERYWHERE

Unify, monitor, and orchestrate your apps across all of your computing resources with NALEJ.

CLOUD THINGS
BARE METAL
WHATEVER COMES NEXT!
RUN APPS ANYWHERE
cloud, IoT and everything in between

NALEJ unifies and manages the operational life cycle for all your applications.
EDGE COMPUTING WITH NALEJ & 5G LETS YOU...

RUN EVERYTHING LIKE AN APP

Secure, low-latency, high-performance digital experiences, everywhere
UNDER THE HOOD
SYSTEM COMPONENTS

Core Components

Data Plane - dynamically optimized user space for deploying applications on edge infrastructure.

Control Plane - secure managed network for all your compute & storage resources.

Management Plane - intuitive design environment for configuring, deploying, and monitoring edge services.

Functional Components

Monitoring, Machine Learning
Orchestration, Rebalancing
Deployment, Caching
Management, Configuration
Control, Networking
LOGICAL MODEL

SERVICE PROFILE
- Resources
- Capabilities
- Connectivity
- Cost
- Performance
- Security

EDGE SERVICE GRAPH
- Configuration and Deployment
  - Public/Private Repository: GitHub, Docker, etc...
- Infrastructure Control and Network
  - Management and Intelligence
- Automated Service Management
  - Public/Private Infrastructure: IoT, Mobile, Cloud, etc...

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PHYSICAL MODEL

NALEJ CONTROL
- Monitoring
- Orchestration
- Management

NALEJ CLUSTER
- Local Net
- Abstraction
- Insta Net

NALEJ FOG
- Local Net
- Abstraction
- Insta Net

InfraNet
Public Net
Local Net
AppNet
InfraNet
Zack Butcher

Founding Engineer, Tetrate
Core Contributor to Istio
Author, Istio: Up and Running
(O’Reilly, Oct 2019)

Previously at Google Cloud; worked on central resource hierarchy, policy (IAM), service management, and Istio

@ZackButcher | zack@tetrate.io
Team of 23 across 10 countries
• From Google, Twitter, Huawei, and more
• Core contributors/maintainers/creators: Envoy, Istio, Apache SkyWalking, go kit, SPIFFE

Mission:
• Accelerate application deployment agility for all applications across any compute
Key Insights and Challenges

• What CORD is tackling at L2/3, mesh is tackling at L4/7
  ○ We’ve disaggregated; now how do we fit it back together? (monolith → microservices)
  ○ Blackbox appliances → software + whiteboxes
  ○ Goal: Enable Service Chains

• Shifting security boundary
  ○ From network identity to application identity

• Enabling mobility
  ○ Connectivity
  ○ Policy (Access Control, etc.)

• Service Model