QoX: Quality of Service and Consumption in the Cloud

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Quality of Service

- Throughput
- Response time
- Packet loss rate
- Uptime
- ...

Service Consumer

Service Providers

Video transcoding

Security monitoring

Salesforce Business services

DoubleClick Advertising Exchange Ad network
Two Sides to Every Service

• What makes a good consumer?
  – Secured
  – Well behaved software
  – Non-bursty requests
  – Long-time user
  – ...

Service Consumer

Service Providers

Video transcoding

Business services

Security monitoring

Ad network

salesforce

DoubleClick
Ad Exchange
Example

Service consumer 1
- Updates 3rd party software
- Tests their own software

Service consumer 2
- Unpatched 3rd party software
- Quick deploy, fix bugs later
Introducing Quality of Consumption

**QoC** captures how well users are consuming a service

**QoX** is QoS and QoC
Using QoX

Measure, interpret, react
The Cloud is more than Individuals

Many service providers and consumers (some both) interacting with each other
Sharing QoX – better service/consumption

Information Exchange

Interactions
(System of Engagement)

Configure

QoS Interpreter
Info about service provider(s)

QoC Interpreter
Info about service consumer(s)

Service Consumer

Configure

Service Providers
Types of Information

Information Exchange

Record of Event

Summary of Exchange

Interactions
(System of Engagement)

QoS Interpreter

Info about service provider(s)

Service Consumer

QoC Interpreter

Info about service consumer(s)

Service Providers

Configure

Configure
Record of Event

I was attacked by consumer X

Service Provider 1

Record of Event

Service Provider 2

Block Consumer X
Summary of Exchange

Information Exchange

I interacted with Y, and the QoS was ...

Service Providers

QoS Interpreter

Info about service provider(s)

QoC Interpreter

Info about service consumer(s)

Service Consumer

Interactions
(System of Engagement)

Configure

I interacted with Z, and the QoC was ...

Configure
Summary of Exchange: What do we share?

• Raw numbers? Not always comparable.
• Propose: scalar, subjective rating

• Subjective... not very quantitative
  – But it measures if other party met expectations
How Can it Be Interpreted?

• Sub-categories?
How Can it Be Interpreted?

• Text based review
  – Machine generated from logs
  – Unstructured text to structured data (e.g., Elastic Search)

Service downtime in past week was 10 minutes.
Experienced high latencies.
Personalization

- Personalization: Highlight most relevant
  - Similar use of API, similar interaction, etc. (e.g., PredictionIO)

Service downtime in past week was 10 minutes.
Experienced high latencies.
Attacks (positive or negative)

Sybils

Lying
Sybils
Lying

• For Summary of Exchange – becomes in the noise

• For record of event -- dangerous
  – We’re going to act on the information
Cloud Provider as Vouching Authority

• Sybils: Verify identity
  – Tie account to a real world thing

• Lying: Verify interaction
  – Can cloud provider collect evidence to back tenant’s claim?
  – Tenants provide “evidence patterns”
  – Measurables: burst of traffic, crashes, packets actually exchanged
Conclusions

• Need to create measurable metrics for QoC
• Sharing QoX can lead to better services/consumption
• A practical QoX information exchange is possible

• Of course, it’s all a work in progress
THANK YOU