QoX: Quality of Service *and* Consumption in the Cloud

Murad Kablan, **Eric Keller**, Hani Jamjoom

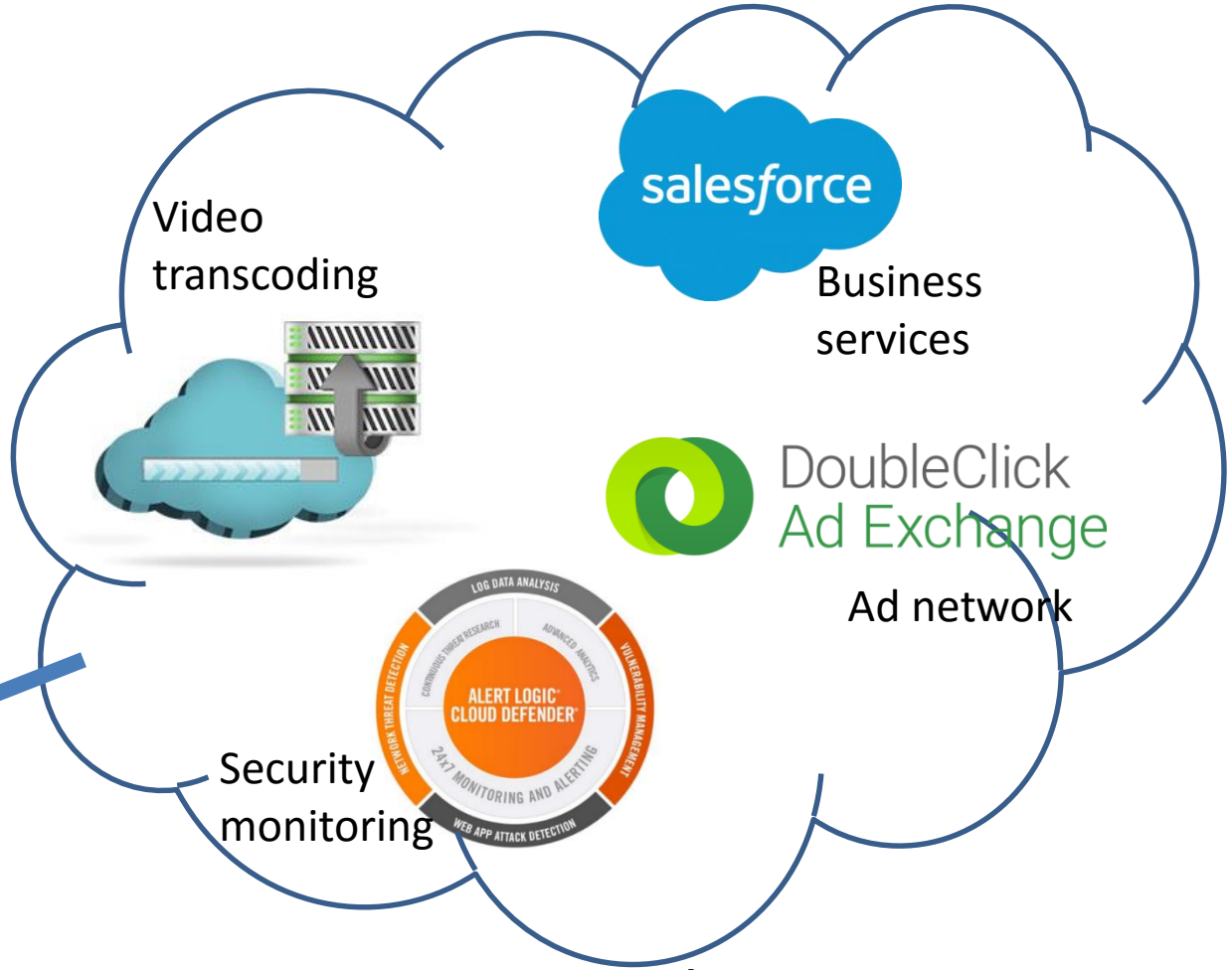
eric.keller@colorado.edu

IBM Research

Quality of Service

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

Service Consumer

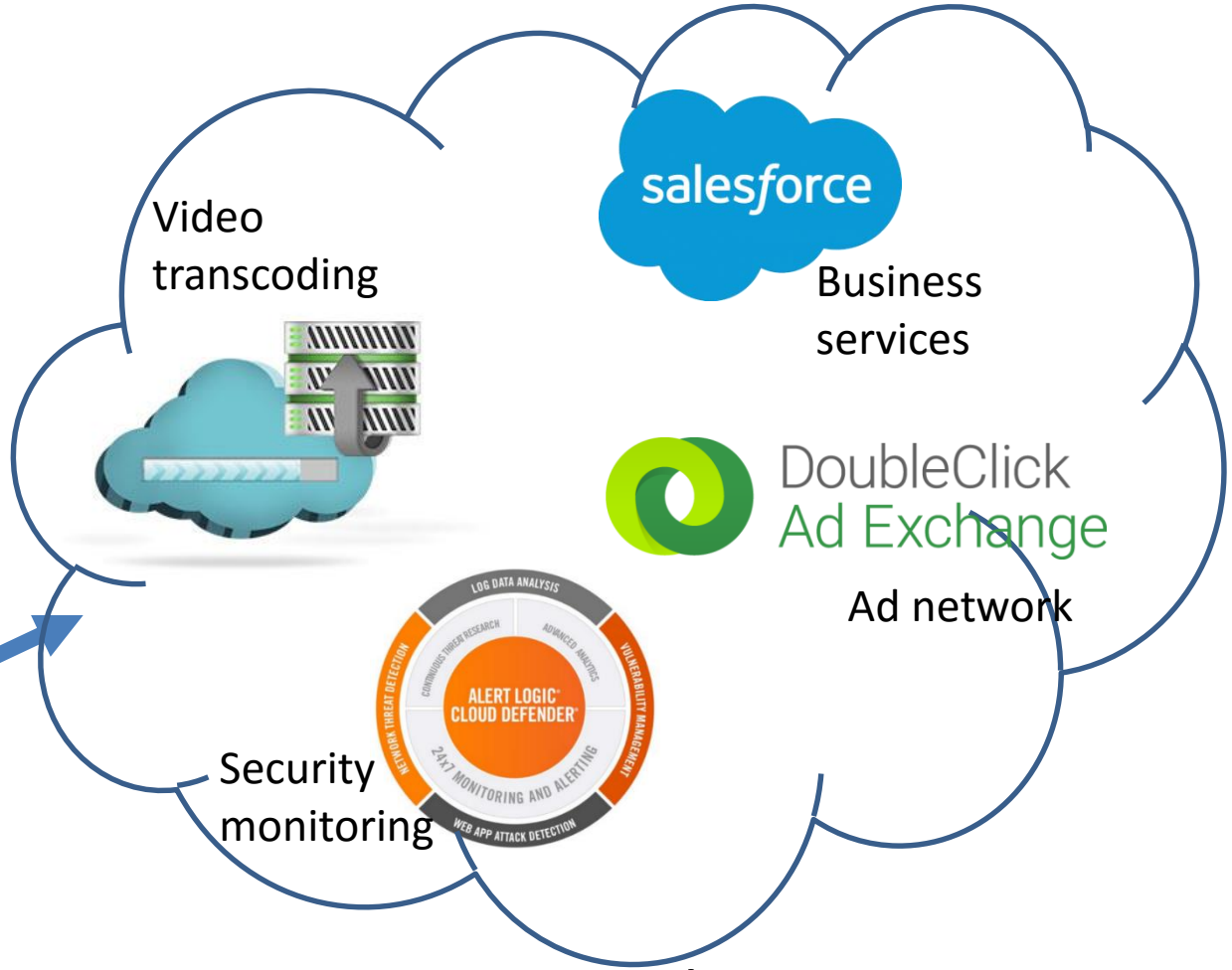


Service Providers

Two Sides to Every Service

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

Service Consumer



Service Providers

Example

Service consumer 1

Updates 3rd party software
Tests their own software

Service consumer 2

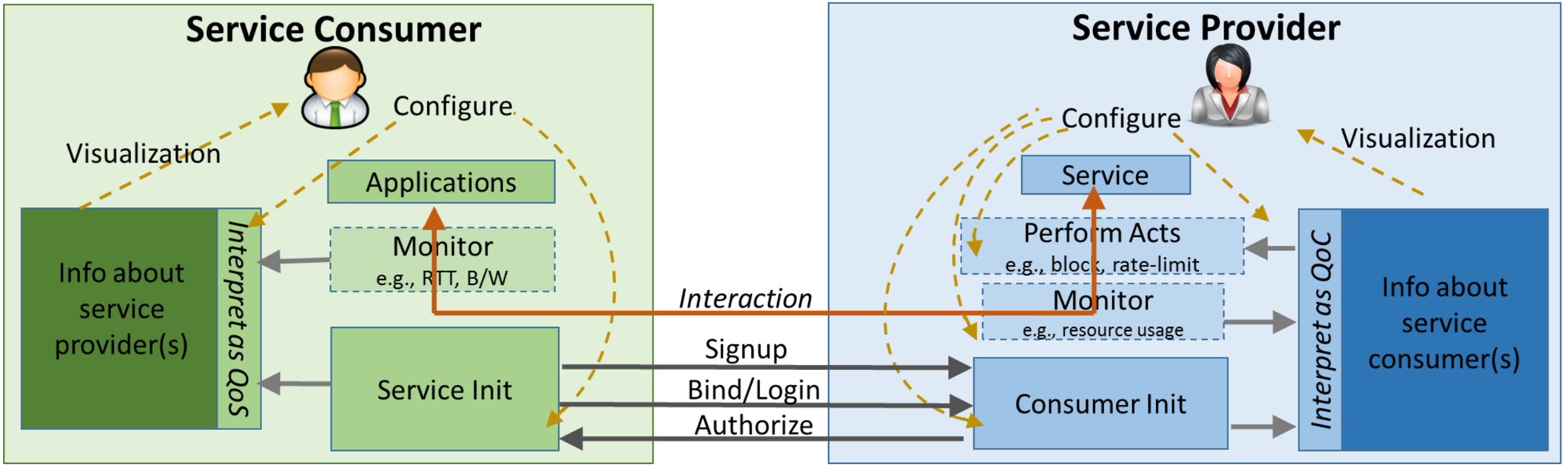
Unpatched 3rd party software
Quick deploy, fix bugs later

Introducing Quality of Consumption

QoC captures how well users are consuming a service

QoX is QoS and QoC

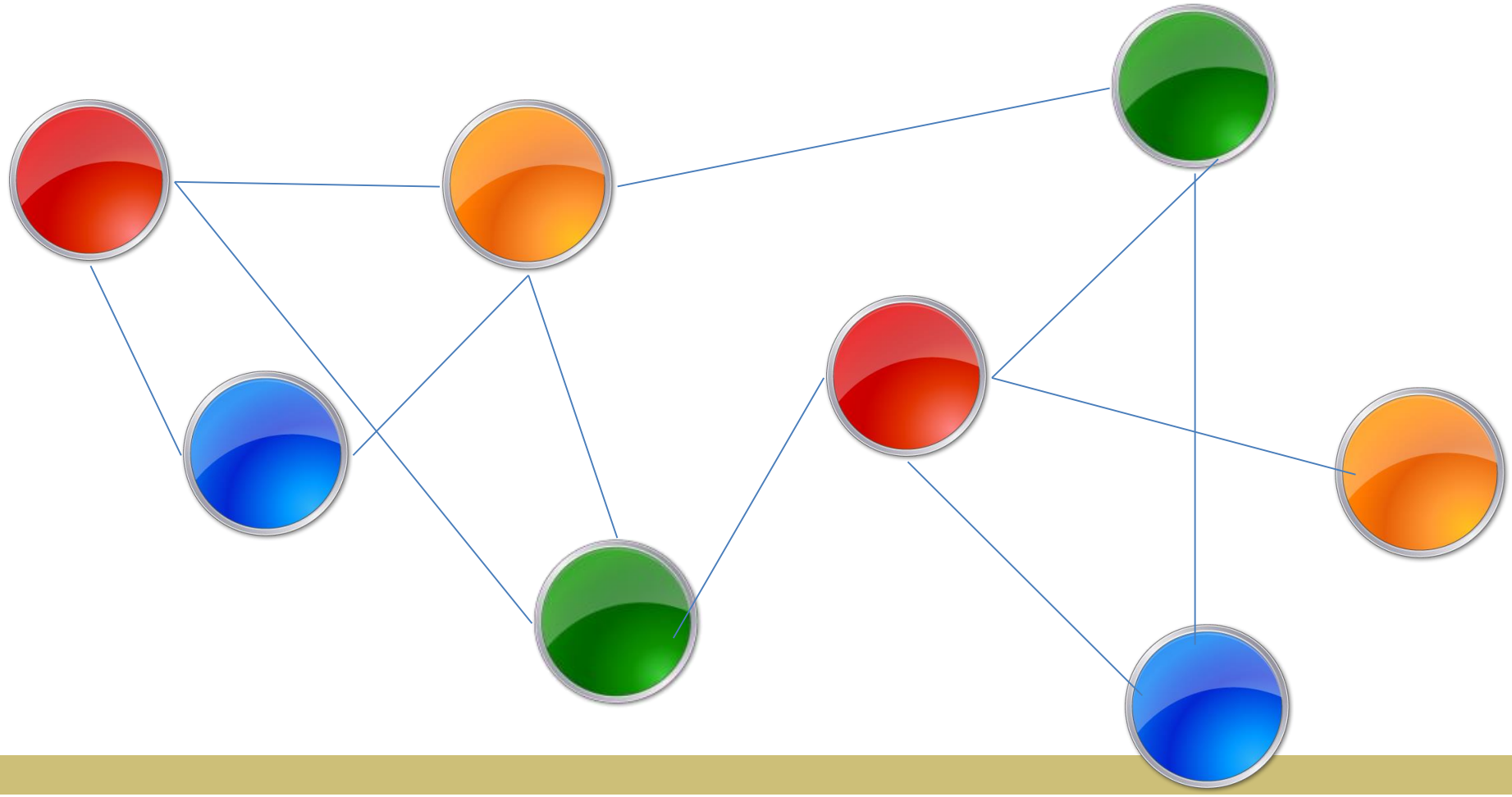
Using QoX



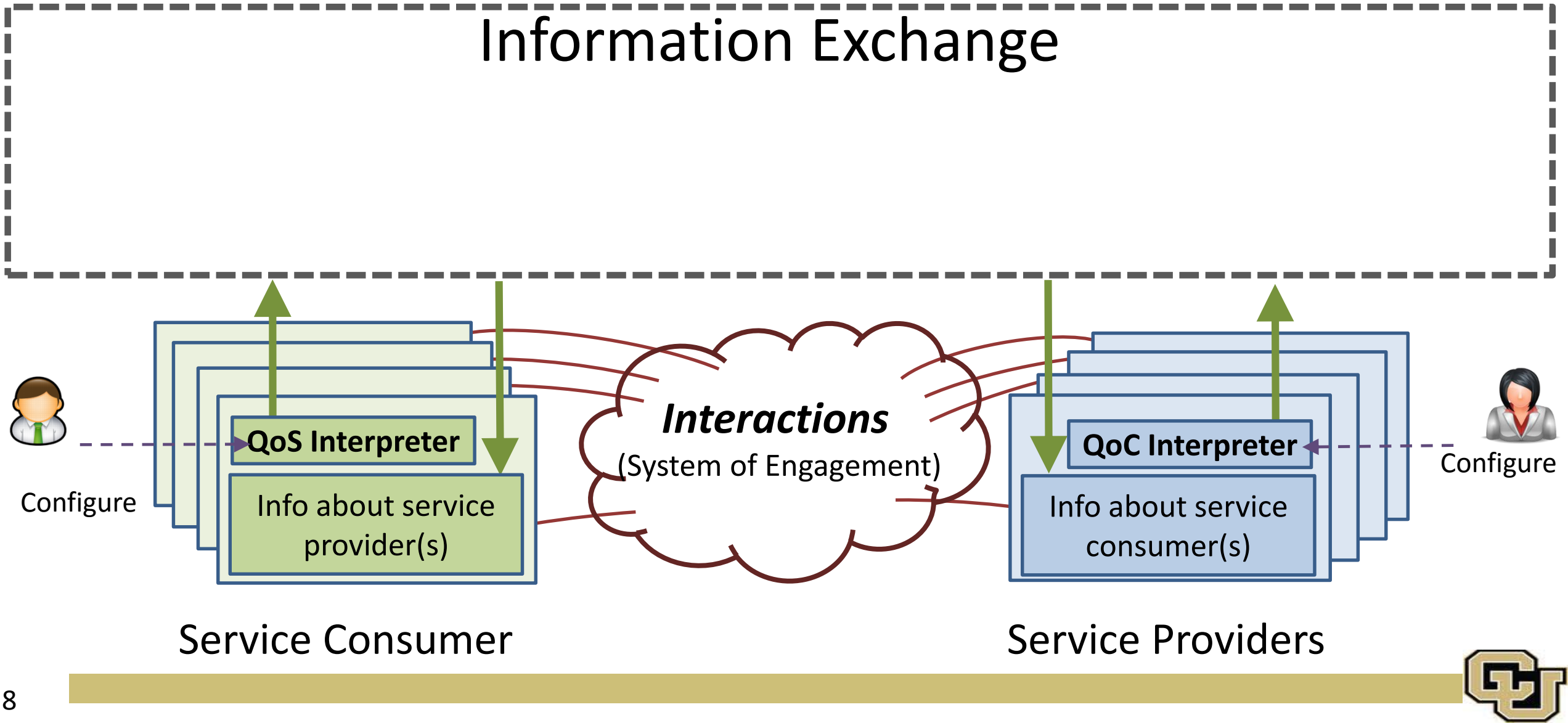
Measure, interpret, react

The Cloud is more than Individuals

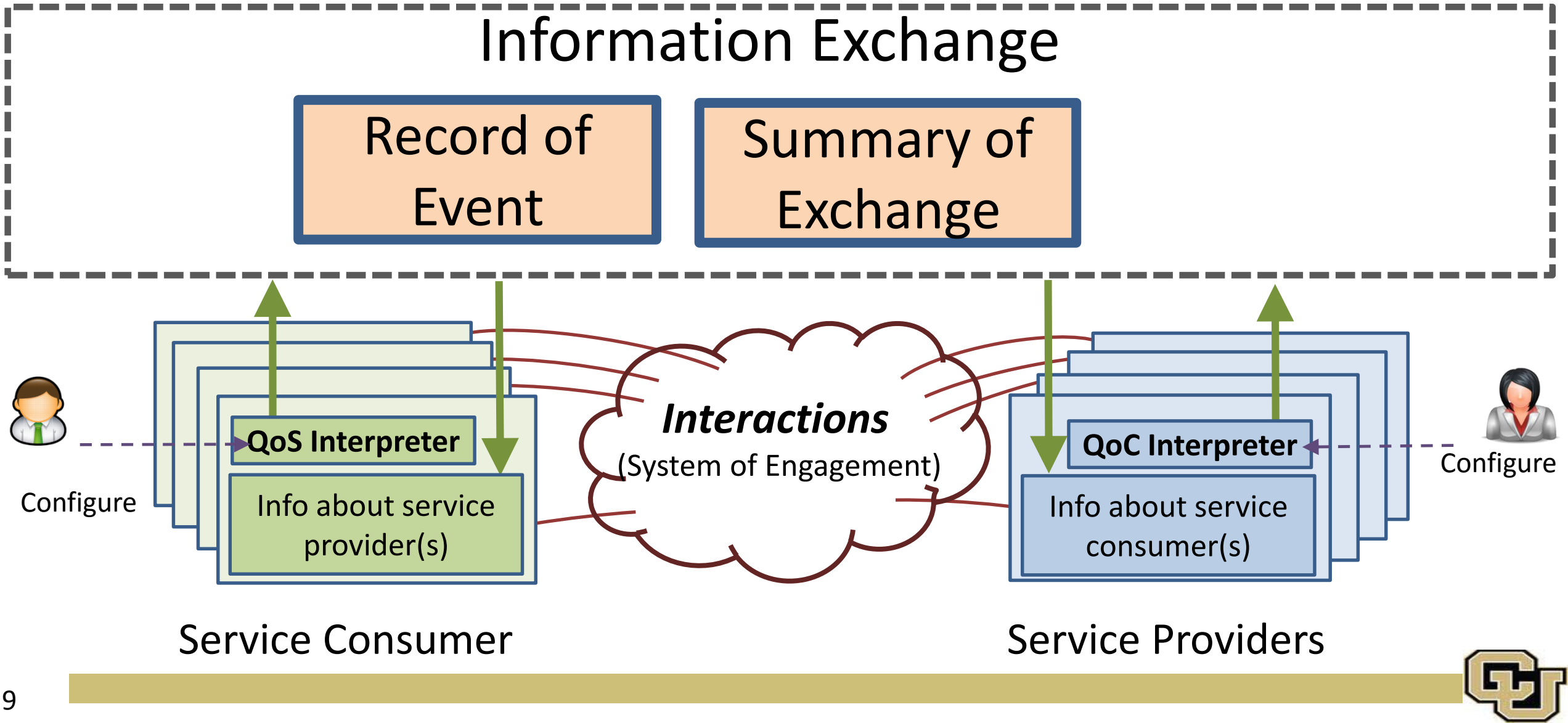
Many service providers and consumers (some both) interacting with each other



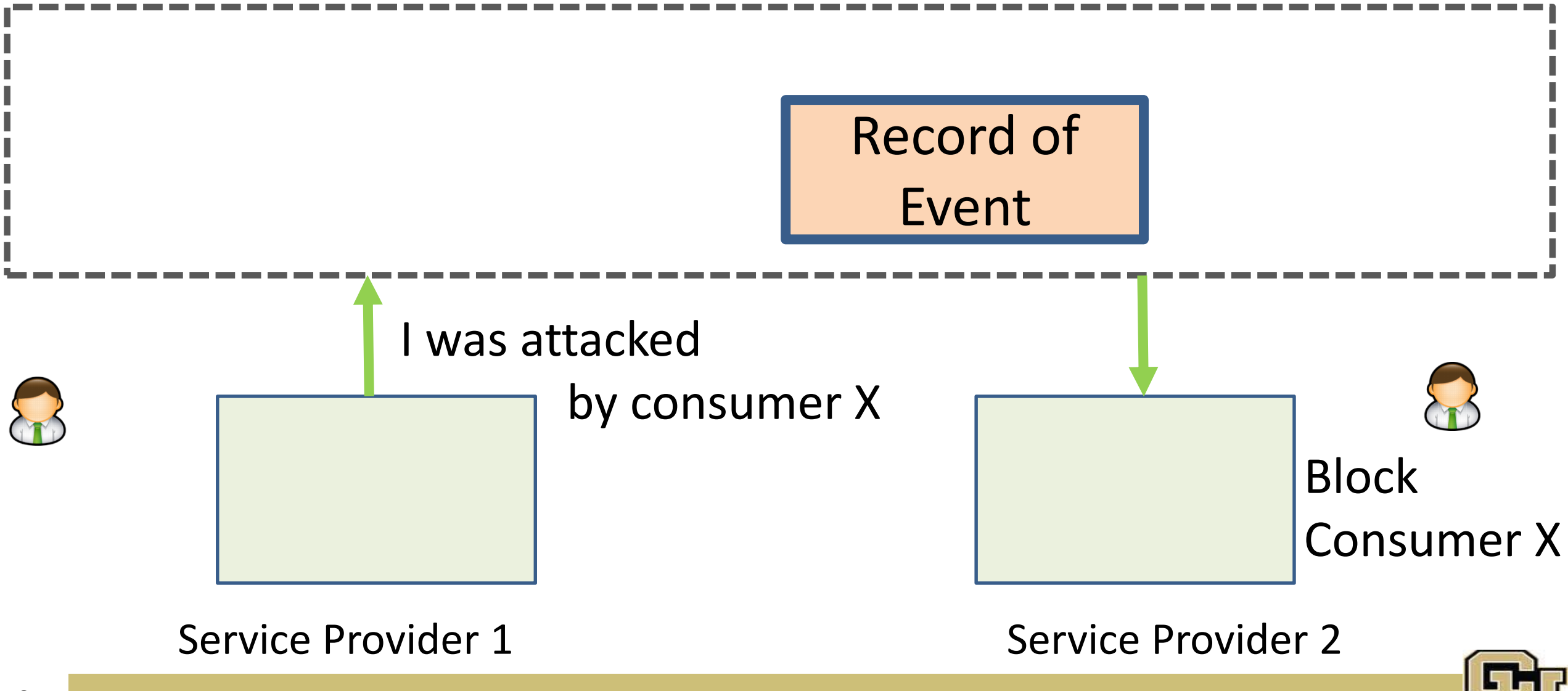
Sharing QoX – better service/consumption



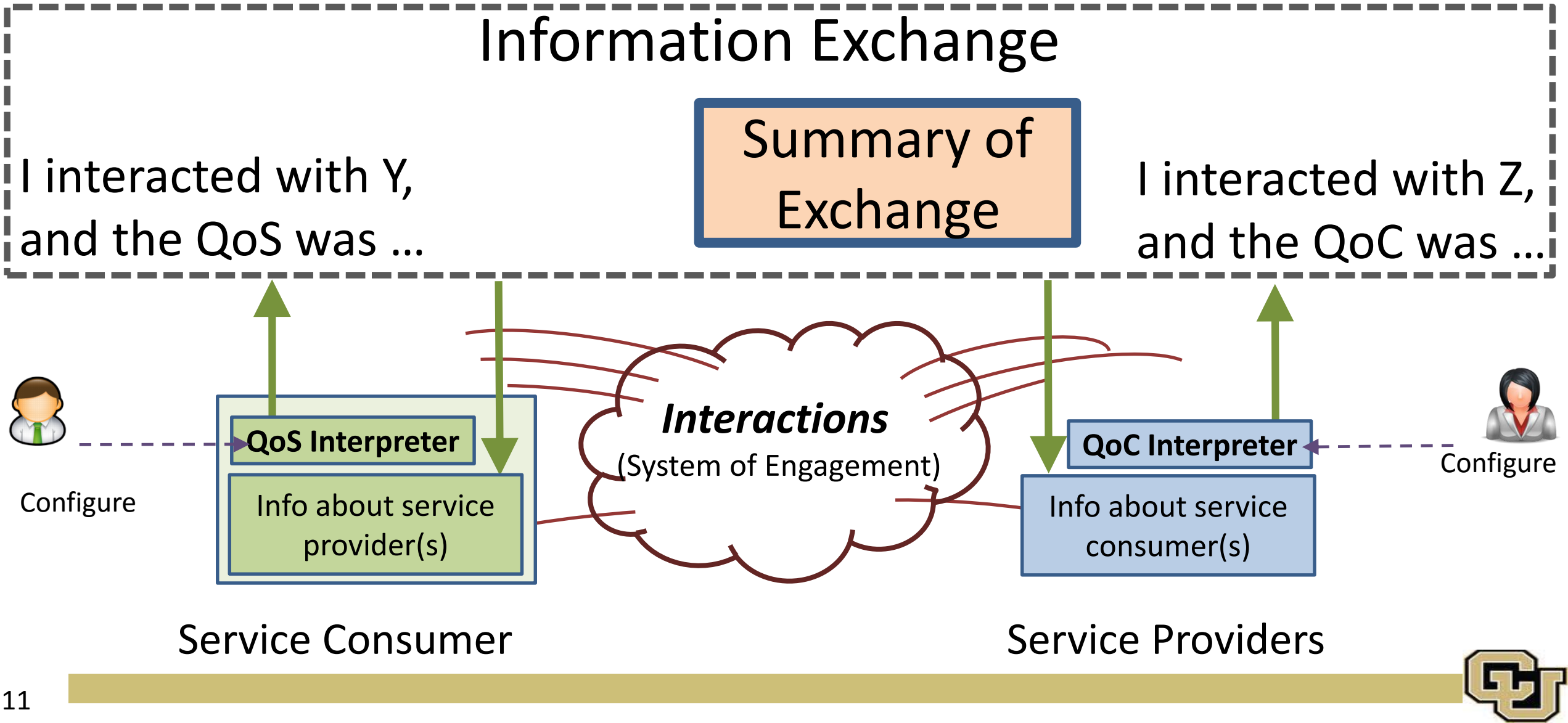
Types of Information



Record of Event



Summary of Exchange



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)

3:32 pm 4/12/15

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)

3:32 pm 4/12/15

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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