Customer Experience Index for Evaluating Network Quality for Cloud Applications

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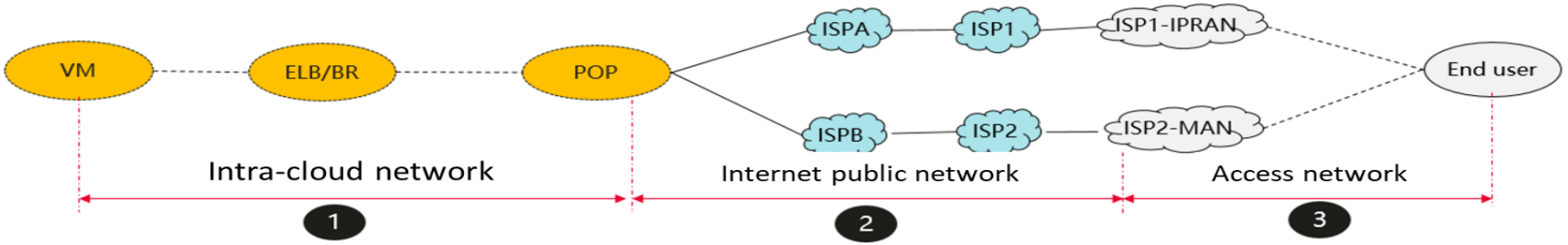
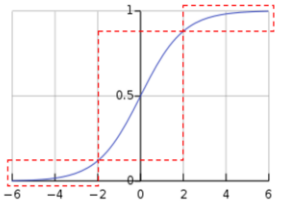


Scenario:
Users access the cloud applications via **three network segments**:
public network (1) has the widest coverage in the entire process (2) high network complexity.
==> ※ **Quality of public network has great impact** on cloud applications.
※ It is **difficult** for cloud vendors **to directly access application-level** Key Quality Index (KQI) data.

Intuition: deriving authentic customer experience from basic network metrics to facilitate network optimizations

Goal & Challenges: A unified evaluating method of network experience for cloud application
(1) No single KPI can provide accurate reflection of the experience for diverse services
(2) No unified evaluation method for experience quality

$$\sigma(x) = \frac{1}{1+e^{-x}}$$



Method: Observation & Formulation
CEI -- comprehensive **formula incorporating latency + packet-loss rate + jitter** (adopting the **S-curve** method for experience assessment – it expresses **sensitive & smooth zones** as user experience)

$$CEI(x,y,z) = w_{lat} \cdot \frac{1+e^{b_{lat}}}{1+e^{a_{lat}\cdot x+b_{lat}}} + w_{los} \cdot \frac{1+e^{b_{los}}}{1+e^{a_{los}\cdot y+b_{los}}} + w_{jit} \cdot \frac{1+e^{b_{jit}}}{1+e^{a_{jit}\cdot z+b_{jit}}}$$

Parameter a,b: by fitting each KPI CEI curve based on a large amount of operational data
Weights: by adjusting its weight values (w1, w2, w3) according to various application categories