



UNSW SYDNEY

Standardizing Multimedia QoE Telemetry from Telecommunications Networks for Open Analytics

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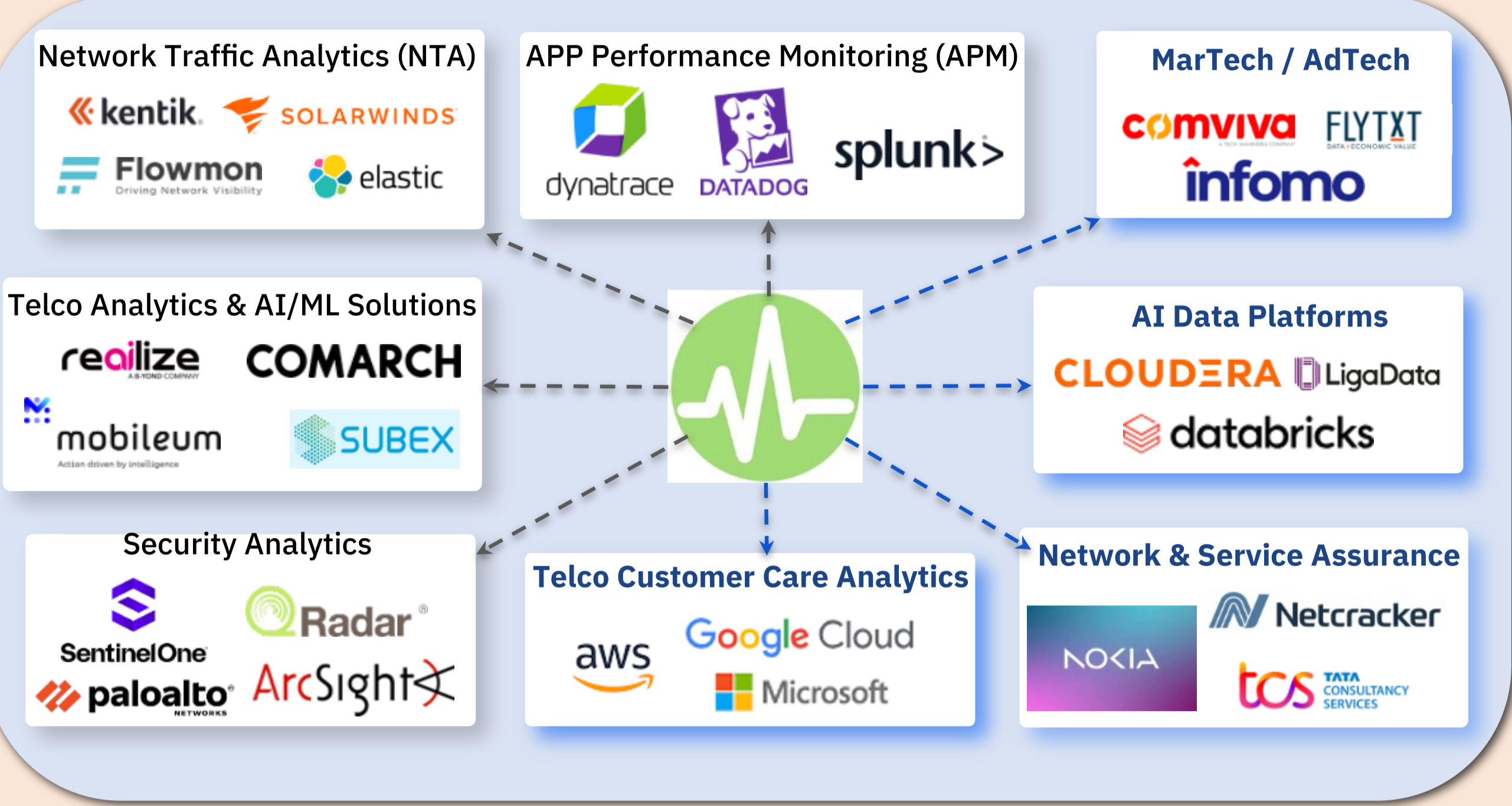


Session III: Analytics 2:45pm – 3:00pm

scan for data schema and code



Network operators strive to leverage AI ecosystem for



Network visibility providers each talking in their own language, making it **difficult** for cloud AI to be leveraged...

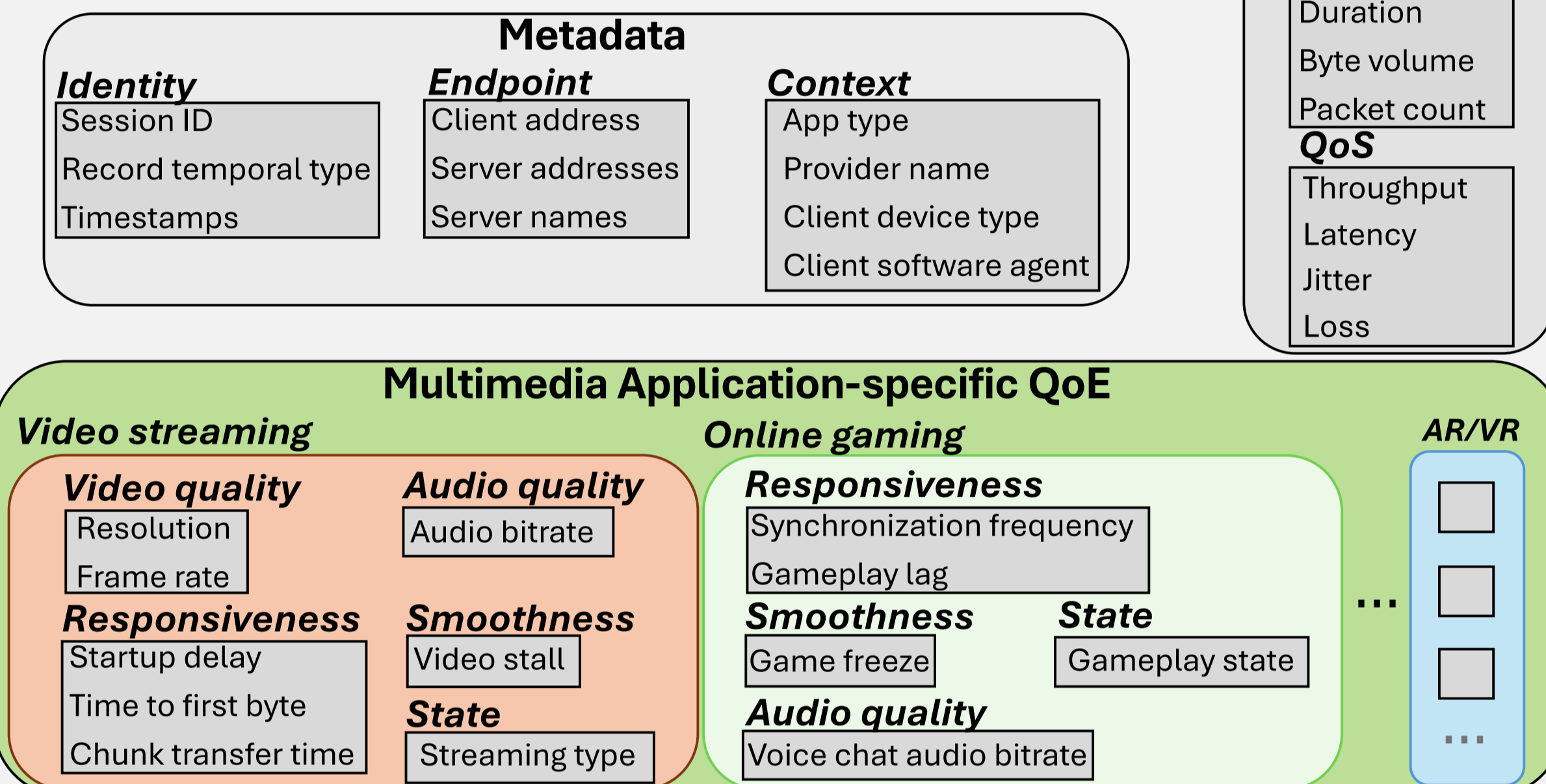
the reality is...



As a first step to address this gap, we propose...

1 Standardized Data Schema

Data Schema of Network Telemetry for Multimedia App Session

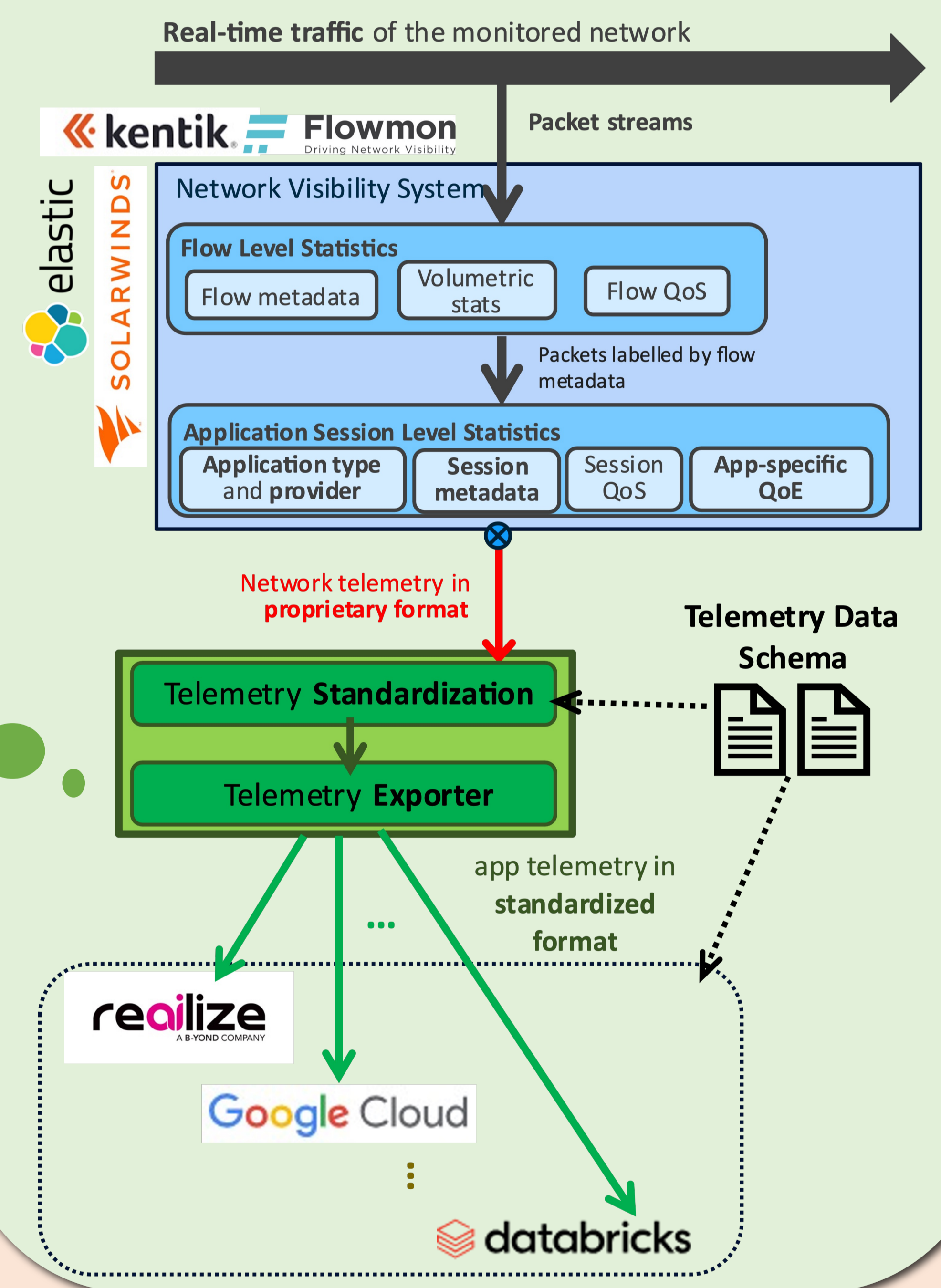


Super-NetFlow



our data schema is used in ...

2 A unified process on top of network visibility platforms



currently covers 8 types of multimedia apps

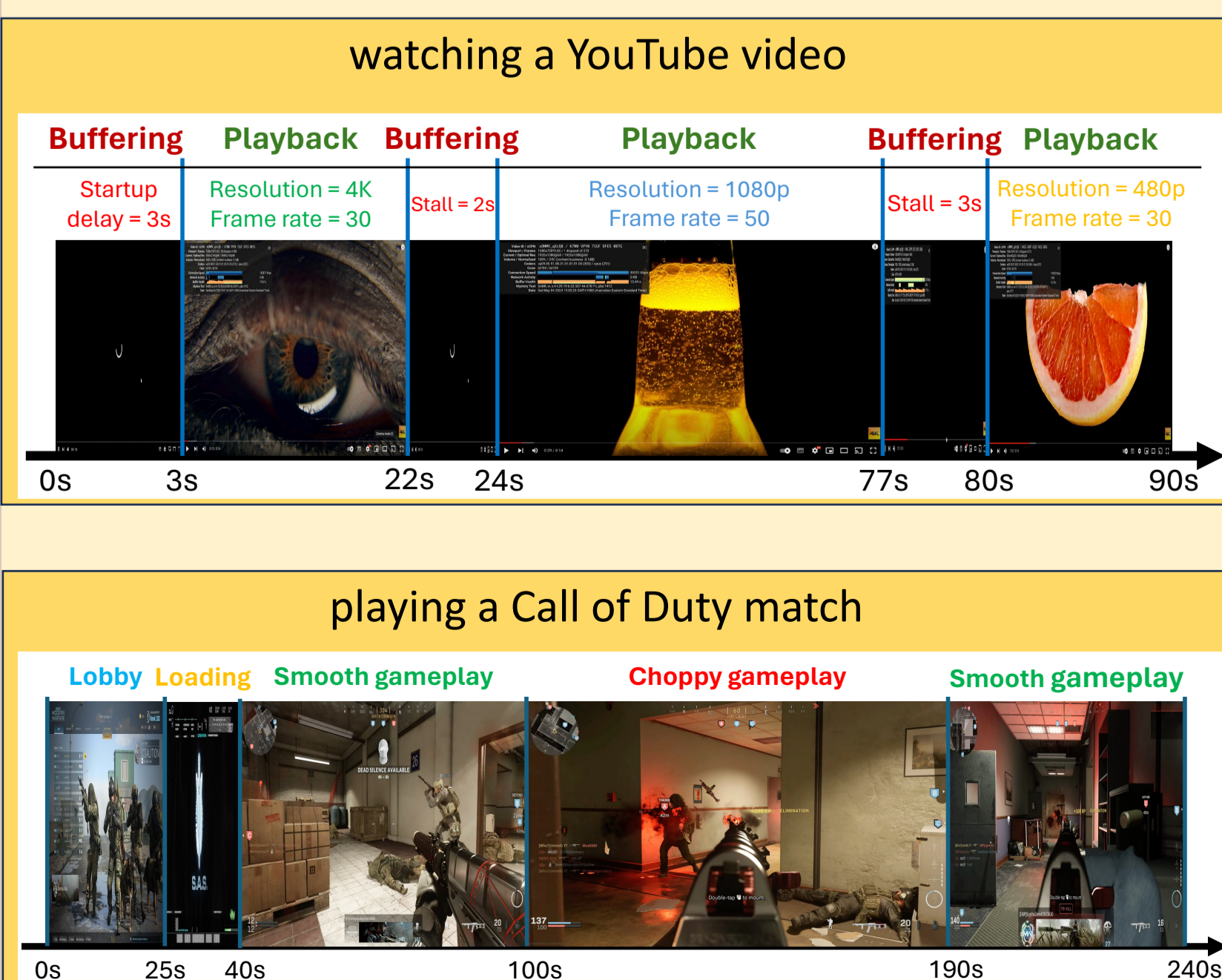
Application type	Popular provider	Example QoE metric
On-demand video streaming	YouTube, NETFLIX	Resolution, frame rate
Live video streaming	twitch, LIVE	Startup delay, video stall
Online gaming	FORTNITE, CALL OF DUTY	Gameplay lag, game freeze
Voice/video calling	WhatsApp, zoom	Voice dropout, frame drop
Music streaming	Spotify, Apple Music	Audio bitrate, loading delay
Cloud gaming	GEFORCE NOW, XBOX	Resolution, frame rate
AR/VR	VRCHAT, RECROOM	Activity lag, motion freeze
Social networking	facebook	Page load time

Telemetry exported in IPFIX/OTel data format

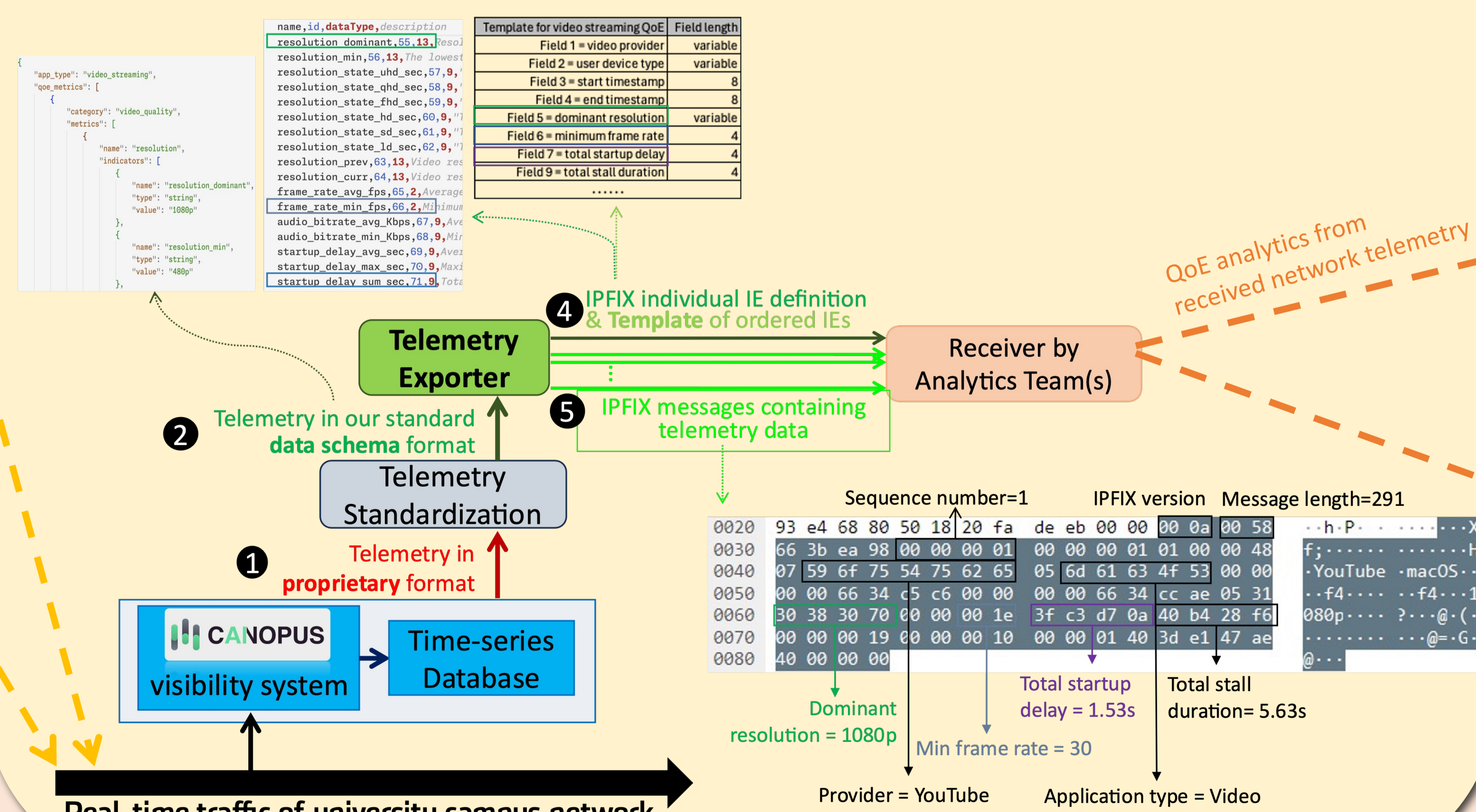
Name	Element ID	Data type
sourceIPv4Addr	IANA.8	ipv4Address
applicationName	IANA.96	string
userDeviceType	PRIV.1000	string
...
flowDurationMilliseconds	IANA.161	unsigned32
throughputInboundAvgMbps	PRIV.3001	float32
...
videoResolutionDominant	PRIV.4000	string
audioBitrateAvgKbps	PRIV.5000	float32
videoStartupDelayMs	PRIV.6002	float32
videoStallDurationMs	PRIV.7001	float32
videoStreamingType	PRIV.8000	string
...

Demonstration on our university campus network with a commercial (Canopus) network visibility system

User device connected to the campus network



Network telemetry generated by the commercial network visibility system, standardized by our middle layer, and exported as IPFIX messages



QoE Analytics

