

IMS Data Channel – Revolutionizing the Phone Call

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NOKIA

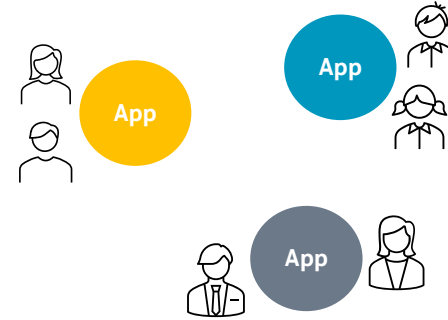
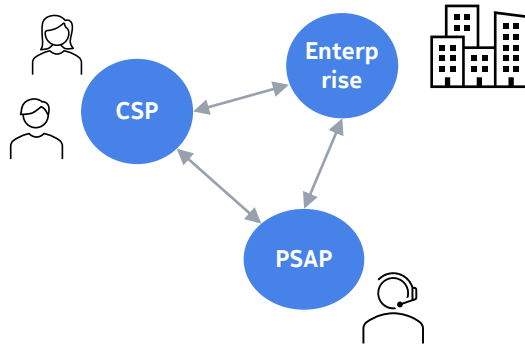
IMS Data Channel

Agenda

1. The problem statement
2. The IMS Data Channel solution
3. Example app use cases
4. IMS Data Channel developer communities and deployment options
5. Potential business models

The problem statement

CSP's innovation and monetization problem



Anybody can call anybody via any CSP including for emergency services. But the business model changed w/ revenues declining. Slow innovations.

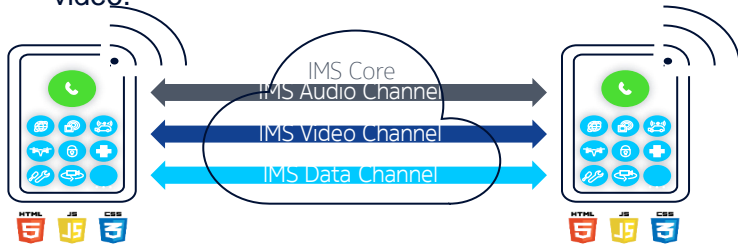
Silo apps require users to be on the same islands. Few connections to businesses. No emergency services. Fast innovations.

How can CSPs provide innovative apps quickly without standardization while still being interoperable?

The solution: enhancing the IMS architecture

Adding IMS data channel

- IMS DC is standardized by 3GPP to enrich the end-user call experience
- Enhances the native dialer of the mobile devices with browser capabilities
- Allows operators to provide in-call web applications, without the need to install OTT apps from Play Store / App Store
- These in-call web applications are accessed over the new IMS Data Channel, which is yet another channel / media type besides the regular voice and video.



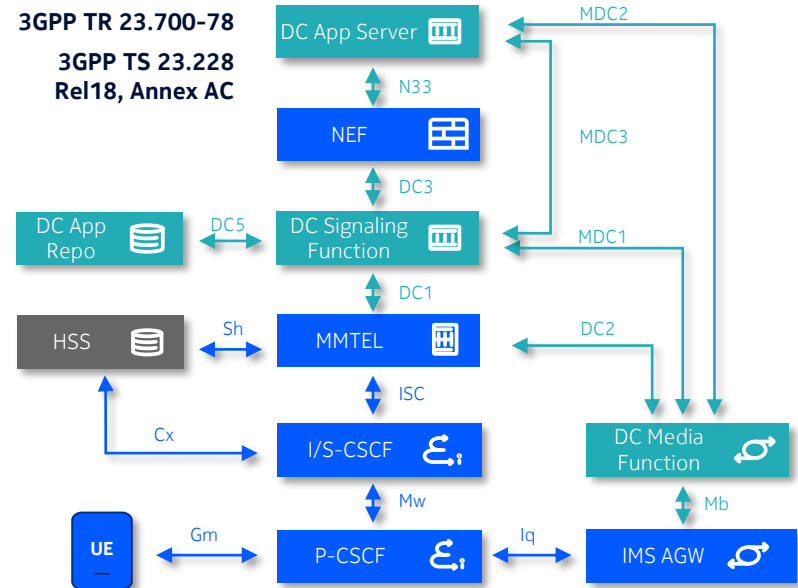
Role legend

New

Enhanced

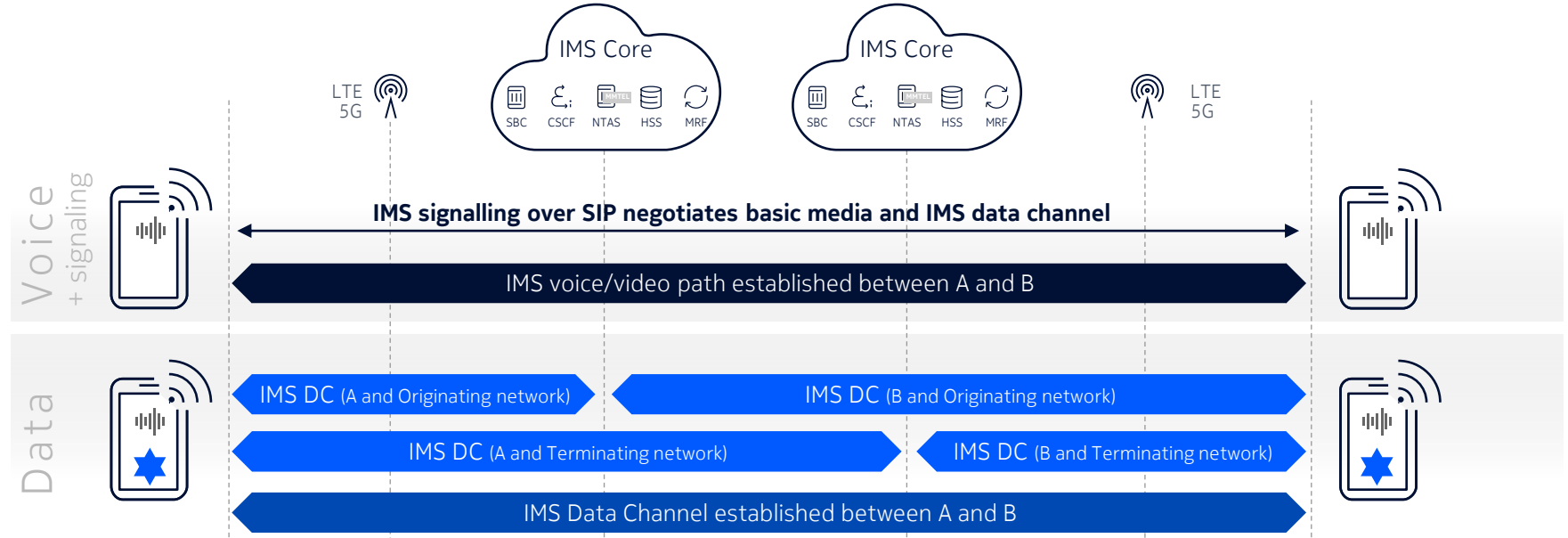
Unchanged

3GPP TR 23.700-78
3GPP TS 23.228
Rel18, Annex AC



The solution: the additional flows

Adding IMS data channel

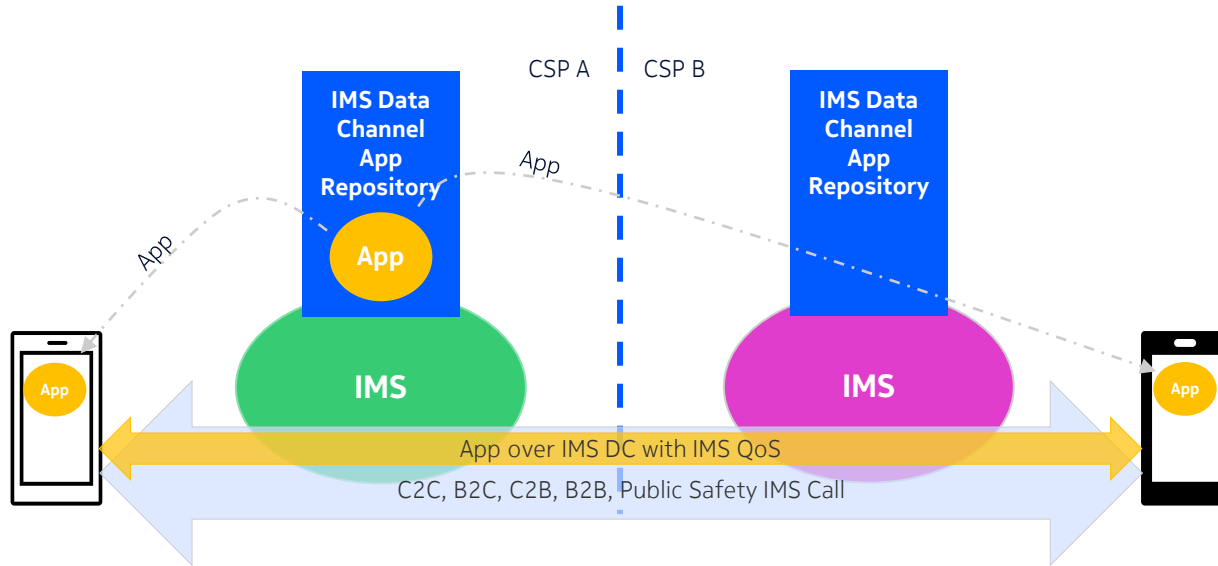


- Enterprise
- Consumer
- CRM agent
- IoT
- Drone

- Enterprise
- Consumer
- CRM agent
- IoT
- Drone

Revolutionizing the phone call

The benefits



IMS Data Channel Benefits

1. No app pre-installation on device required.
2. No app subscription required.
3. Easy to build app with web languages, e.g. Javascript.
4. No app standardization needed.
5. No app interop testing required.
6. App comes from only one CSP.
7. Platform for potential new disruptors of current OTTs.

CSPs gain new revenue with unlimited, fast, interoperable yet proprietary innovations

Standardization

GSMA, 3GPP

- **Data Channel concept was initially introduced early 2010s** for data traffic associated with a call (**WebRTC**) and was later endorsed in 3GPP Rel – 12 with service-level interworking to MSRP messaging
- **3GPP Rel-16 introduced first definitions for IMS Data Channel in 2020** since then further updates released and also leveraging existing capabilities, here main references:
 - **3GPP TS 26.114** (Rel-16) introduced IMS DC framework 1Q/2021
 - **3GPP TS 26.114**, Annex E (Rel-16) defines the QCI parameters for PDN connection for IMS Data Channel use
 - **3GPP TS 24.229** (Rel-16) defines how UE to negotiate use of IMS DC
 - **IETF RFC 5866** defines SIP media feature tag for MIME subtypes (+sip.app-subtype feature tag).
 - **IETF RFC 8864** defines methods for Negotiation Data Channels Using the Session Description Protocol (SDP)
 - **GSMA PRD NG.134** IMS Data Channel defines minimum mandatory features for UE and Network
 - **NG.114** IMS Data Channel further details for interoperable IMS DC services, including DC establishment & termination
 - **GSMA NG.129** IMS Data Channel White Paper, December 2021
 - **GSMA IR.92 & IR.94** introduced the IMS DC as optional in May 2021
 - **WebRTC RFCs** such as IETF RFC 8864, RFC 8831
- In addition to PDN and SIP handling changes, **the UE needs to adapt the dialer, that is to render the IMS Data Channel content** (high level: 3GPP TS 26.114, chapter 4.2, but GSMA has special Work item ongoing to further agree the interworking details for example between DC server(s) and UE's dialer and OS, and how to upgrade/downgrade a call to add/remove DC using SIP signalling.
- Furthermore, the specification work is planned to **continue in Rel-18** (3GPP TR 23.700-87) to **complete full normalized solution**

IMS Data Channel

Example App Use Cases

IMS Data Channel use cases

Four domains of applications

Supplementary Services

- Enriched Caller ID, e.g. call intent, images
- Advanced Call Hold, e.g. wait time, queue position, user-selected music/video
- Text-based IVR aka Smart Menu

Offered from CSP and/or Enterprise

Public Safety

- Enriched emergency services calling with PSAP, e.g. AR, content sharing, and language translation
- Advanced first responder apps
- Mission critical apps, 311

Offered from CSP or Public Safety Org

Enterprise (B2C, C2B, B2B)

- Apps leveraging content sharing, e.g. image share, whiteboard, etc. and language translation
- Apps leveraging AR/VR/XR, volumetric 3D images/videos

Offered from CSP and/or Enterprise

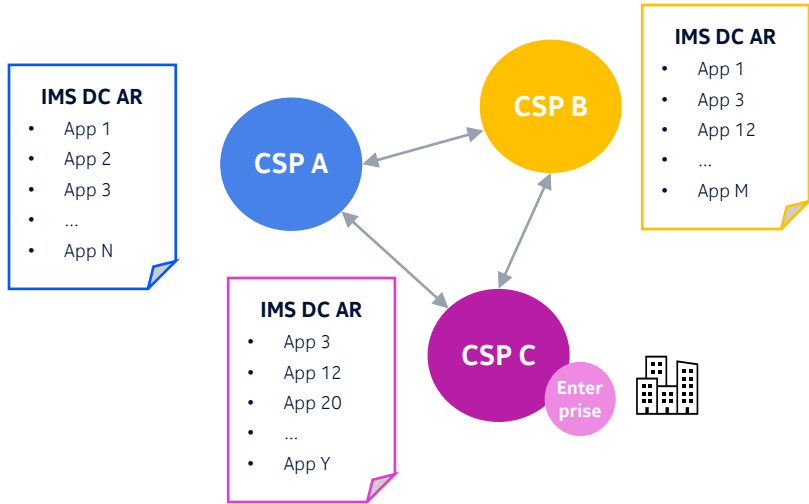
Consumer (C2C)

- AR/VR/XR
- Content sharing
- Games
- Language translation
- User avatar/emoji

Offered from CSP

IMS Data Channel use cases

A unique, differentiated combination of apps for each CSP

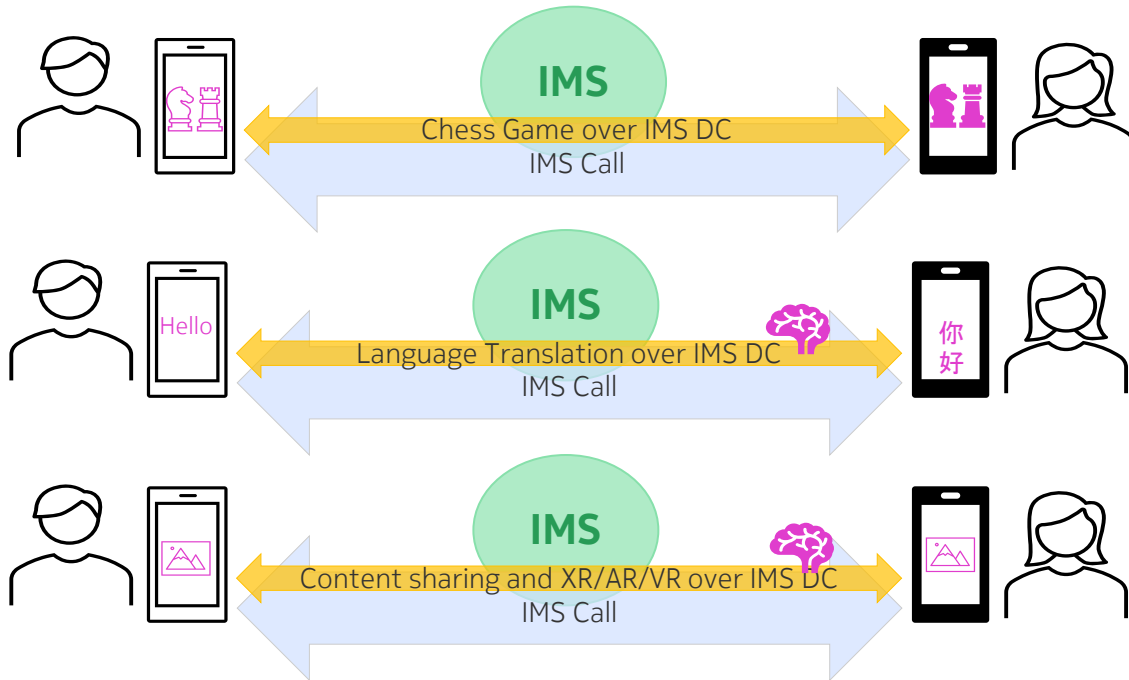


<p>Advanced Supplementary Services</p> <ul style="list-style-type: none">• Enriched Caller ID, e.g. call intent, images• Text-based IVR• Advanced Call Hold, e.g. wait time, queue position, user-selected music/video	<p>Enterprise (B2C, C2B, B2B)</p> <ul style="list-style-type: none">• Apps leveraging content sharing, e.g. image share, whiteboard, etc. and language translation• Apps leveraging AR/VR/XR, volumetric 3D images/videos
<p>Public Safety</p> <ul style="list-style-type: none">• Enriched emergency services calling with PSAP, e.g. AR, content sharing, and language translation• Advanced first responder apps• Mission critical apps, 311	<p>Consumer (C2C)</p> <ul style="list-style-type: none">• AR/VR/XR• Content sharing• Games• Language translation• User avatar/emoji

Each CSP can offer their own unique set of IMS DC apps for differentiation while at the same time, their apps can still work between CSPs that support IMS DC !

IMS Data Channel use cases

Gaming, language translation, content sharing & AR/VR



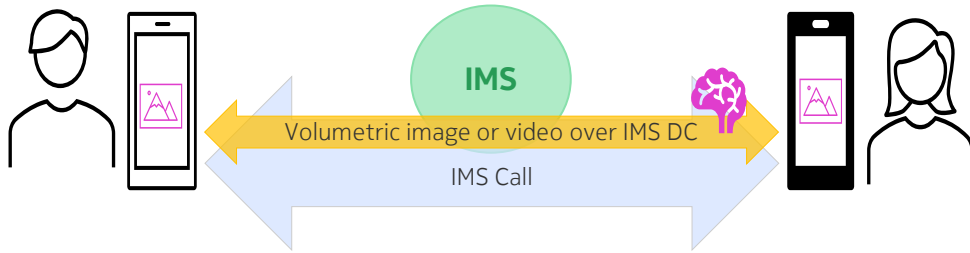
While voice or video calling, easily initiate and use an IMS DC app in parallel.

Only require one CSP to offer the IMS DC app.

No pre-installation or app registration needed.

IMS Data Channel use cases

Vision: extend IMS DC to support 3D images/video



Generative AI can turn 2D images into 3D volumetric images or video.

Berkeley Engineering

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Nerfstudio SIGGRAPH 2023 trailer

Researchers create open-source platform for Neural Radiance Field development

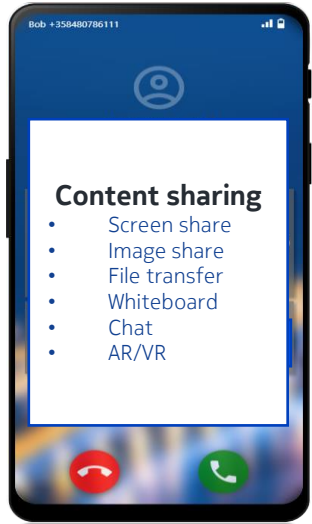
Plug-and-play framework makes it easier to collaborate and develop interactive 3D scenes

July 25, 2023 by Marni Ellery

Just a few years ago, Berkeley engineers showed us how they could easily turn images into a 3D navigable scene using a technology called Neural Radiance Fields, or [NeRF](#). Now, another team of Berkeley researchers has created a development framework to help speed up NeRF projects and make this technology more accessible to others.

IMS Data Channel use cases

Using content sharing apps as building blocks for enterprise IMS DC apps



1. **Retail app** – image share, file transfer, chat, AR, VR, XR
2. **Doctor app** – image share, file transfer, AR/XR, chat, whiteboard
3. **School app** – whiteboard, file transfer, AR, VR, XR
4. **Bank app** – screen share, file transfer, AR
5. **Hotel app** – image share, file transfer, AR, VR
6. **Auto repair shop app** – image share, file transfer, AR
7. **Insurance app** – screen share, file transfer, chat
8. **Emergency services** – image share, chat, AR, XR

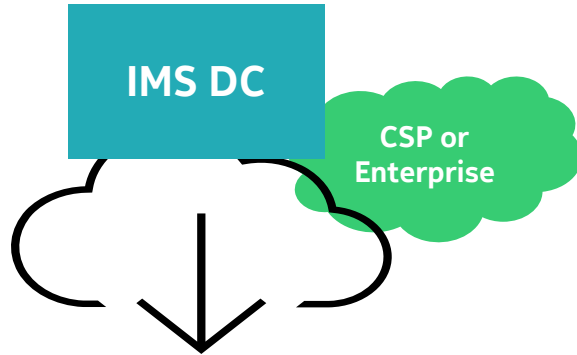
Disaggregating content sharing features to enhance enterprise services

Demo videos

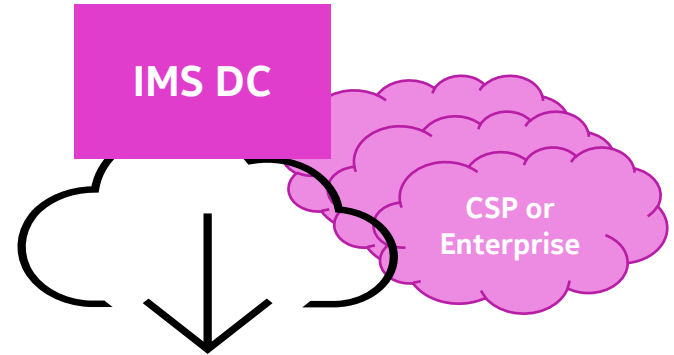
IMS Data Channel Application developer programs and communities

IMS Data Channel

Developer programs and communities



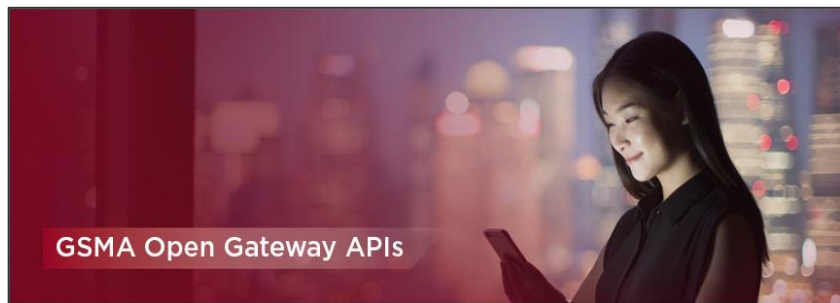
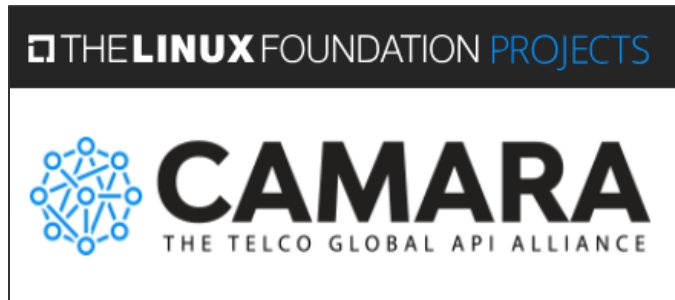
CSP-hosted / Enterprise-hosted



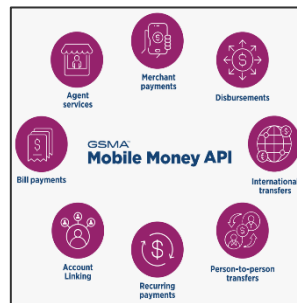
Aggregator-hosted

The API economy

Telecom initiatives



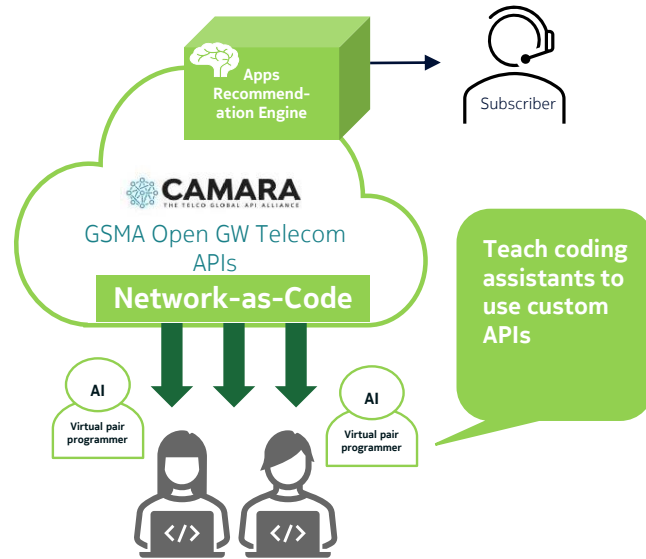
GSMA Open Gateway is a framework of Application Programmable Interfaces (APIs) designed to provide universal access to operator networks for developers and hyperscalers.



- GSMA Open Gateway APIs are defined, developed and published in **CAMARA**.
- CAMARA is the LINUX foundation open source project for developers to access enhanced network capabilities.
- 3GPP/GSMA IMS Data Channel gives apps a platform to gain interoperability without standardization.

Monetization thru the API economy

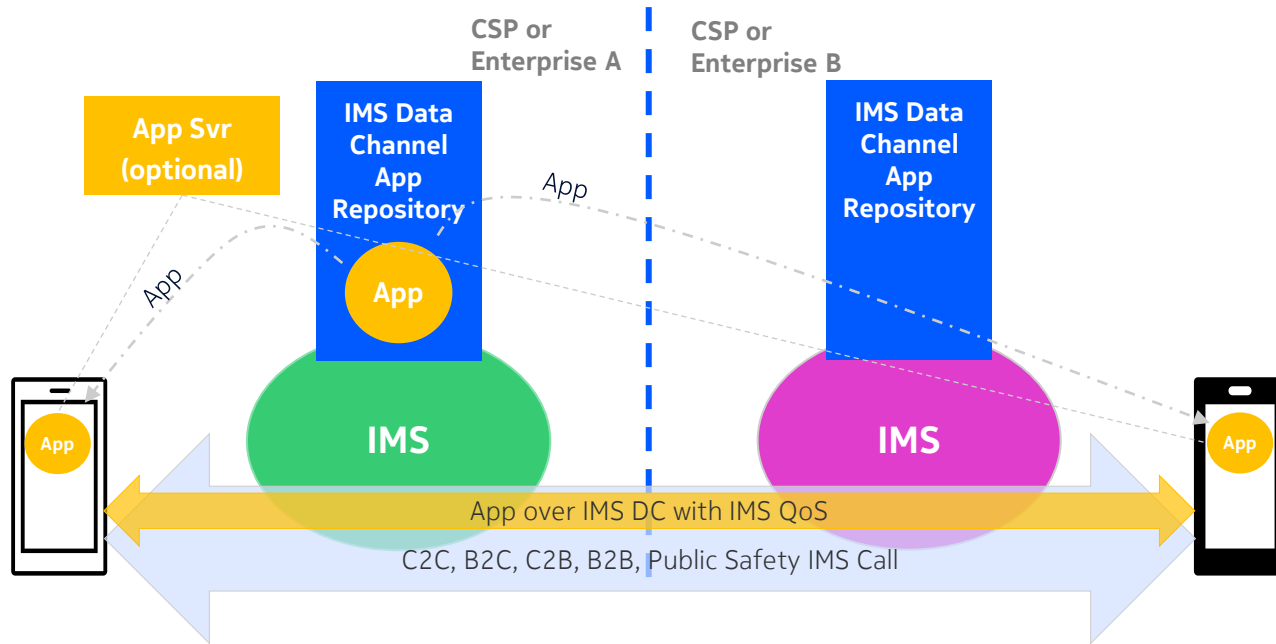
Exposing IMS Data Channel APIs and integrating with AI-enabled coding assistants



Future developer communities will consist of traditional human programmers, human programmers aided by AI coding assistants, low code / no code human prompt and AutoML engineers, automatic code generators.

IMS Data Channel deployment

Supplementary services



Supplementary Services

Example apps

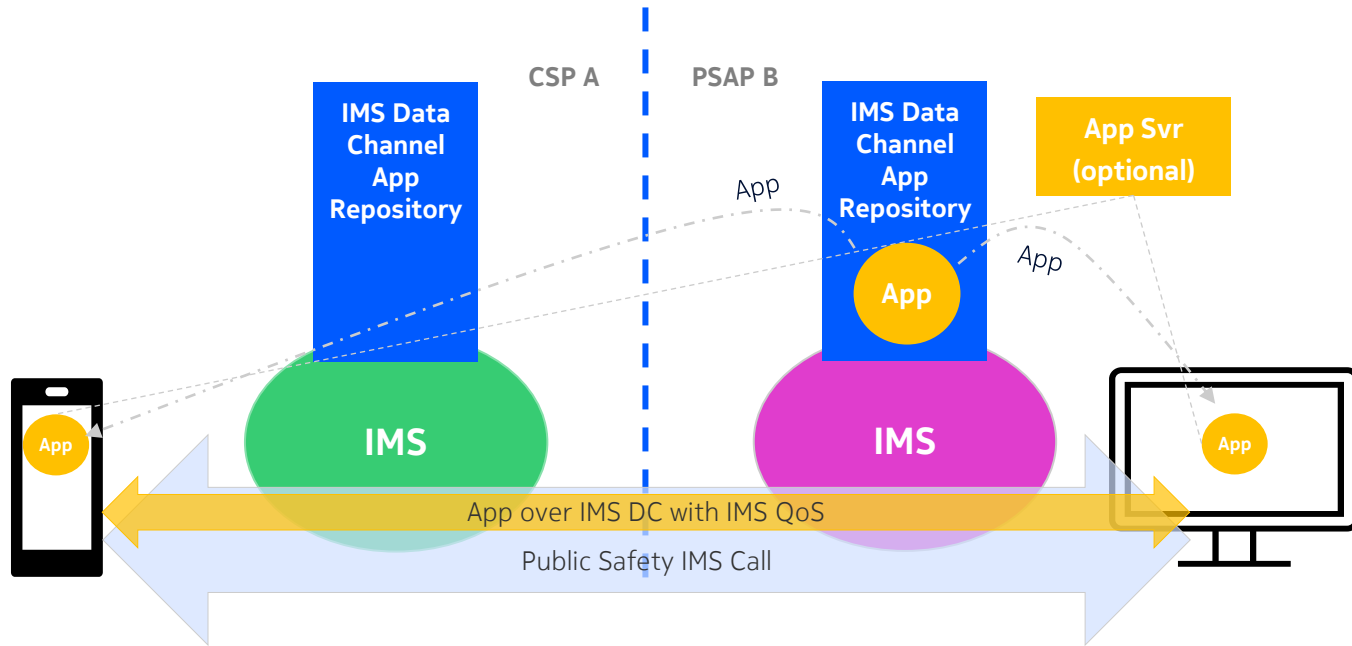
- Enriched Caller ID, e.g. call intent, images
- Text-based IVR
- Advanced Call Hold, e.g. wait time, queue position, user-selected music/video

Development

- Vendor develop apps
- Vendor offers APIs for CSPs / 3pty to develop apps

IMS Data Channel deployment

Community to PSAP



Public Safety

Example apps

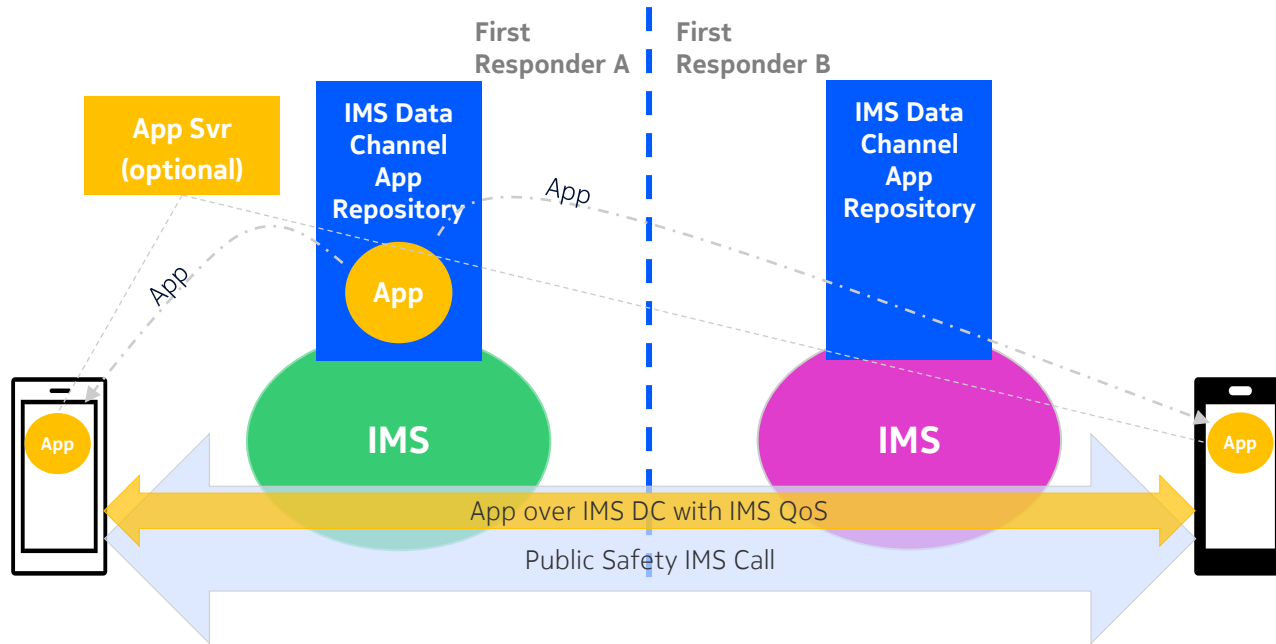
- Enriched emergency services calling with PSAP, e.g. AR, content sharing, and language translation
- Advanced first responder apps
- Mission critical apps

Development

- Vendors develop apps
- Vendors offer APIs and CSPs/3pty develop apps

IMS Data Channel deployment

Intra/inter First Responders



Public Safety

Example apps

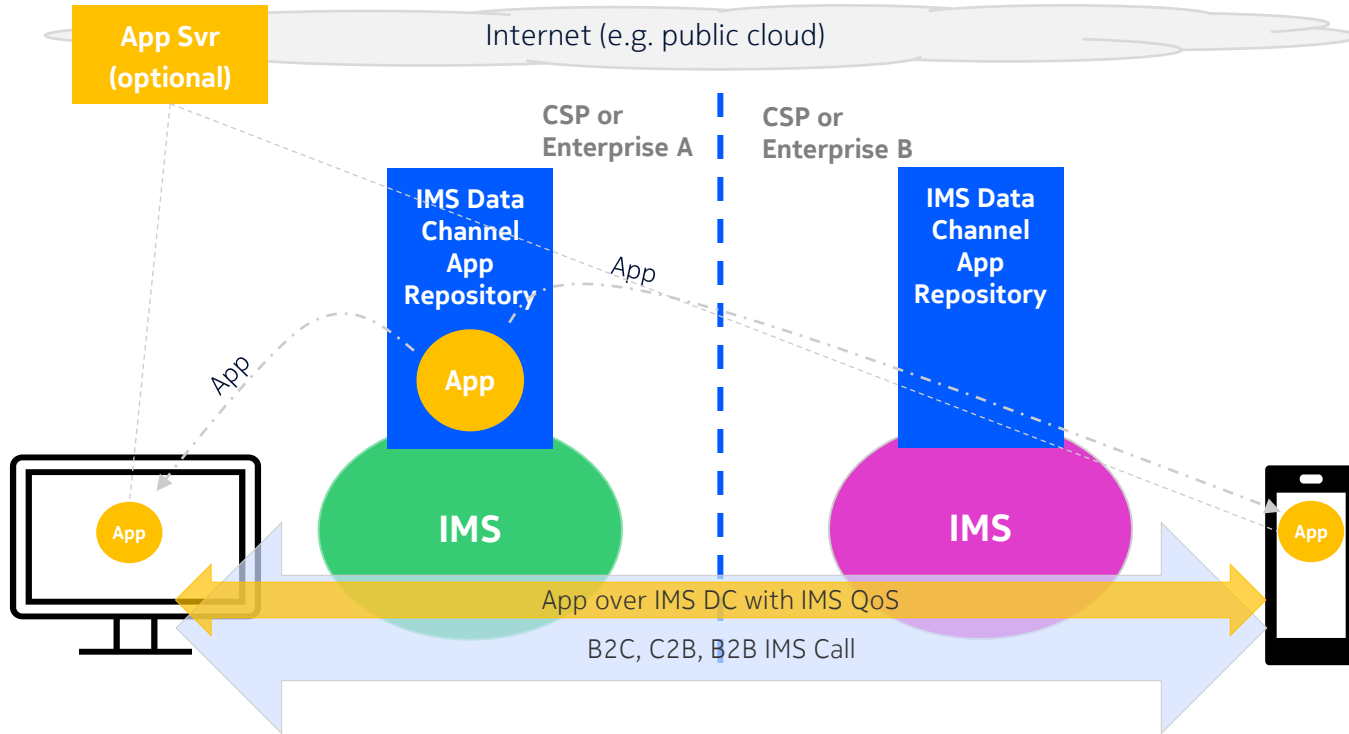
- Enriched emergency services calling with PSAP, e.g. AR, content sharing, and language translation
- Advanced first responder apps
- Mission critical apps

Development

- Vendors develop apps
- Vendors offer APIs and CSPs/3pty develop apps

IMS Data Channel deployment

Enterprise (B2C, C2B, B2B)



Enterprise

Example apps

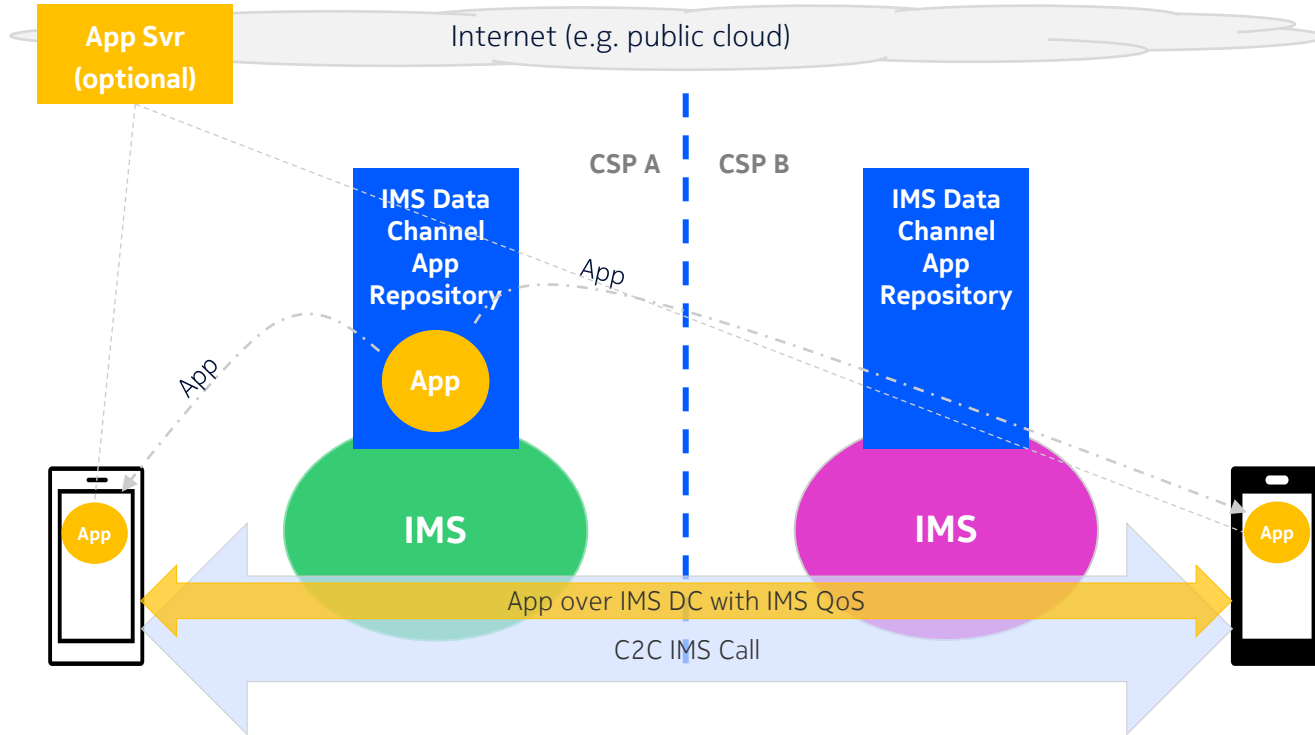
- Apps leveraging content sharing, e.g. image share, whiteboard, etc. and language translation
- Apps leveraging AR/VR/XR, volumetric 3D images/videos

Development

- Enterprise/ partner develop apps

IMS Data Channel deployment

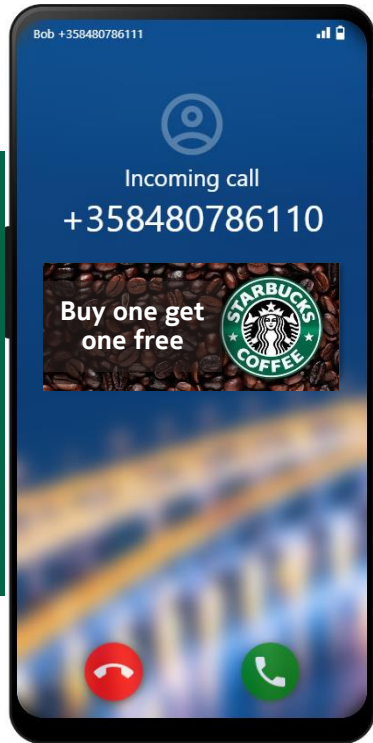
Consumer



Consumer
Example apps <ul style="list-style-type: none">• AR/VR/XR• Content sharing• Games• Language translation
Development <ul style="list-style-type: none">• Vendors / 3pty develop apps

Potential business models

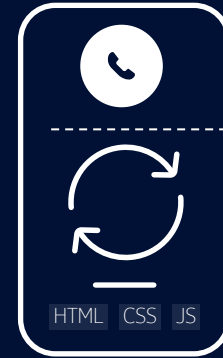
Pre-call, in-call advertisement



Caller and called parties both with tailormade and relevant content

Coffee beans with Starbucks logo from facebook.com

IMS Data Channel Advertising – endless possibilities



Browsified native phone dialer

IMS Data Channel

B2B | B2C | C2C

- ▶ Targeted/ personalized advertisement
- ▶ Personal discount offers

New Revenues

Example business models for different use cases

#	Use Case Type	Business Model	Example UCs
1	OTT integration	Revenue share	WhatsApp, Skype, Facetime
2	Call supplemental services	Advertising	Enhanced Caller ID, Menu “IVR”, Enhanced Call Hold, IMS authenticated identity for secured 3rd party App Access.
		Table stakes	
3	Content sharing	Advertising	Screen share, whiteboard, image share, file transfer, chat, AR/VR
		Table stakes	
4	Custom enterprise app	Subscription or transaction-based	Hotel, bank, furniture store, plumber, doctor
5	Entertainment / tourism	Subscription or transaction-based	Sporting events, museums, city guides, language translation
6	Emergency svcs / public safety	Table stakes	AR help, content sharing, location/map, transcription for public-PSAP and amongst first responders
7	Other	Multiple	RCS, business messaging

Q&A

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