



CAMARA

The Telco Global API Alliance

Steering Committee

14.04.2022

Agenda

01 Welcome new participants

02 Qorum given?

03 Project governance updates

04 Sub project status

05 Working group status

06 Proposals for API sub projects

07 AOB

Welcome new participants

Public Github repository for CAMARA project













MarkusKuemmerle Update PARTICIPANTS.MD		dce24f8 41 minutes ago	🕒 595 commits
📁 declarations	Update file-header.txt	15 days ago	
📁 documentation	Update CAMARA Project - CNCF Project Proposal.md	12 days ago	
📄 CODE_OF_CONDUCT.md	Update CODE_OF_CONDUCT.md	8 months ago	
📄 CONTRIBUTING.md	Update CONTRIBUTING.md	12 days ago	
📄 PARTICIPANTS.MD	Update PARTICIPANTS.MD	41 minutes ago	
📄 ProjectCharter.md	Update ProjectCharter.md	11 days ago	
📄 ProjectStructureAndRoles.md	Update ProjectStructureAndRoles.md	13 days ago	
📄 README.md	Update README.md	12 days ago	

1. Ensure that your email address is documented in your GitHub profile so that we can add you to the mailing list
2. Insert your name in the PARTICIPANTS.MD file and create a GitHub pull request

Quorum given? Yes

AT&T	Wiley Wilkins (Barry Elia)	✗
Capgemini	Shamik Mishra	✗
Deutsche Telekom AG	Nathan Rader (Markus Kümmerle)	✓
Ericsson	Bart van Kaathoven (Jan Friman)	✓
Google Cloud	Sridhar Gollapudi	✗
GSMA	Henry Calvert	✓
IBM	Jason Hunt (Zyg Lozinski)	✓
Intel	Petar Torre	✓
Kandy	Philip Lintell (Ralph Page)	✓
KDDI	Toshiyasu Wakayama	✓
Microsoft	Landon Cox	✓
MobiledgeX	Heather Blanchard (Christoph Goertz)	✗
Nokia	Chris Jones (Tanja de Groot)	✓
ORANGE	Sylvain Morel	✓
Scenera	David Lee	✓
T-Mobile US	Lyle Bertz	✓
TIM	Roberto Procopio (Fabrizio Moggio)	✓
Telefonica	Juan Carlos Garcia (Jose A Ordonez Lucena)	✓
TELUS	Ali Tizghadam	✓
Vodafone	Johanna Wood	✓

Project governance updates

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Review the documents and provide feedback:

- Correct typos and bad grammar immediately in the files (and create a pull request)
- In case of needed content changes create a GitHub issue



GitHub
issue #43

Project governance updates

New release of marketing materials available

Presentation

CAMARA

The Telco Global API Alliance

04/04/2022

CAMARA
The Telco Global API Alliance

Enable seamless access to 4G/5G network capabilities

4G/5G network capabilities exposed through APIs provide a large benefit for customers. By hiding telco complexity behind APIs and making the APIs available across telco networks and countries, CAMARA enables an easy and seamless access.

4G/5G network capabilities are functions partly available already in 4G but new and much more powerful in the 5G network. These functions enable to get information out of the network but also to configure the network. The on-demand, secure and controlled exposure of these capabilities pave the way for transforming operator networks into service enablement platforms, facilitating the application-to-network integration, which will be key to deliver enhanced and service-tailored customer experience in the 5G era.


Abstraction from Network APIs to Service APIs is necessary:

- To hide telco complexity making APIs easy to consume for customers with no telco expertise (user-friendly APIs)
- To fulfil data privacy and regulatory requirements
- To facilitate application to network integration

Availability across telco networks and countries is necessary:

- To ensure seamless customer experience
- To accelerate technology development and commercial adoption (minimize implementation effort)
- To accelerate education and promotion
- To support application portability

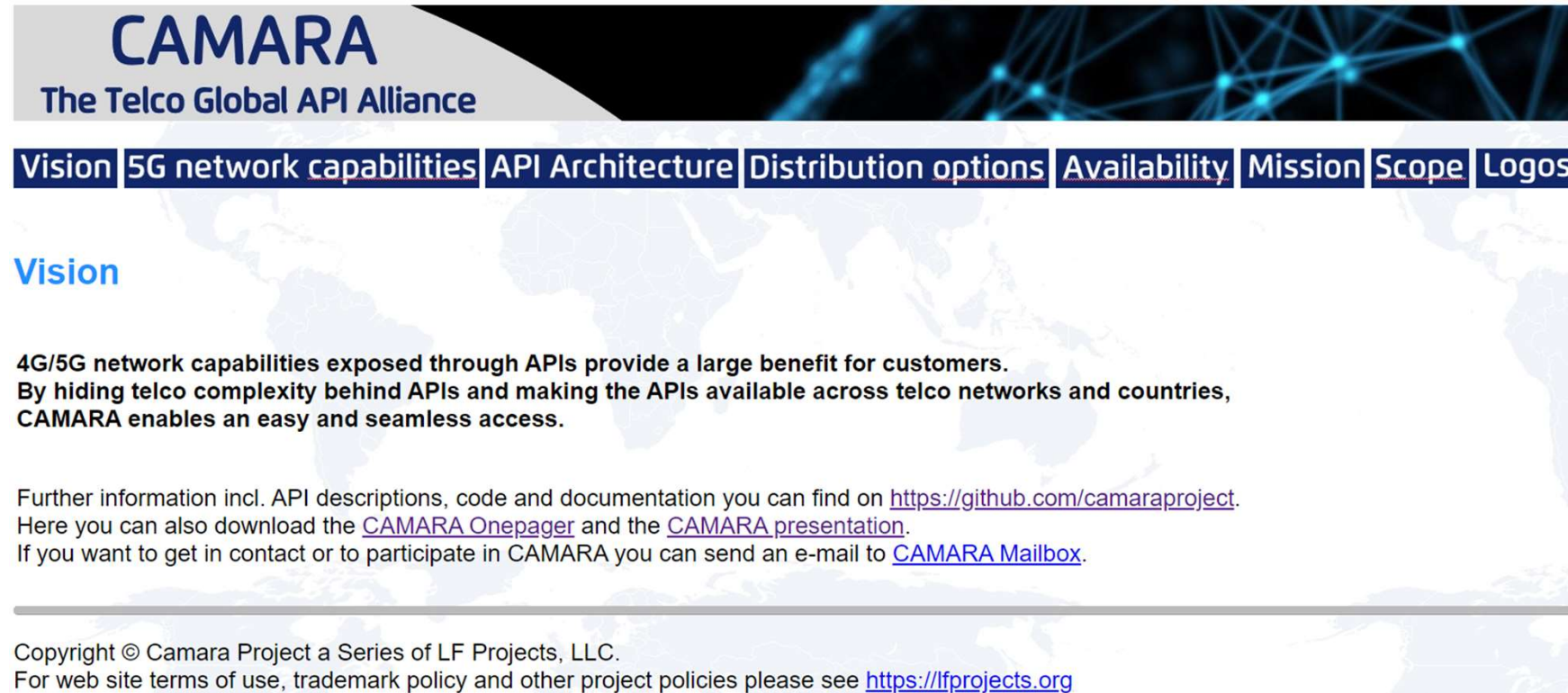
CAMARA is an open source project within Linux Foundation to define, develop and test the APIs. CAMARA works in close collaboration with the GSMA Operator Platform Group to align API requirements and publish API definitions and APIs. Harmonization of APIs is achieved through fast and agile created working code with developer-friendly documentation. API definitions and reference implementations are free to use (Apache2.0 license).



Documents are available here:
<https://github.com/camaraproject/WorkingGroups/tree/main/MWC/documentation/MarketingMaterial>

Project governance updates

CAMARA website available






Website is available here:
<https://camaraproject.github.io/index.html>
<https://camaraproject.org>

Project governance updates

CAMARA mailing list

Currently a mailing list for CAMARA doesn't exist. GitHub functions are not sufficient. Shall CAMARA use one of the free email services?

- Check if joint solution with GSMA is possible
- Check free email service options
- Present solution in next steering committee to decide

PROVIDER	WHAT'S INCLUDED FOR FREE?	COMMENTS
MailerLite 	<ul style="list-style-type: none">• 1,000 subscribers• 12,000 emails p/m• Automations, landing pages and reports	MailerLite offer a decent amount of features on its free plan. This includes autoresponders , sophisticated webforms, (limited) reporting and email support. There are only basic structural templates included, however. (Read our full review)
Sender 	<ul style="list-style-type: none">• 2,500 subscribers• 15,000 emails p/m• Autoresponders + transactional emails• Push notifications• Forms	This simple and easy-to-use email marketing tool includes a sizeable sending allowance and some handy extras like automations and push notifications.
Moosend 	<ul style="list-style-type: none">• 1,000 subscribers• Unlimited emails• All features included• No Moosend branding in emails	In terms of extras, this is probably one of the more generous free plans we've seen, with access to nearly all areas of the tool (landing pages and team accounts not included). It's also the only tool we've tested that doesn't include its own branding in your emails. (Read our full review)
MailChimp	<ul style="list-style-type: none">• 2,000 subscribers	You have restricted features available on the free account (e.g. no advanced

Project governance updates CAMARA in Tecknexus April edition

TECKNEXUS

5G NEWS 5G MAGAZINES 5G INTERVIEWS 5G RESEARCH OUR SERVICES PRICING

2022 Predictions 5G For Manufacturing 5G Towers 5G & Edge Open RAN Private Networks 5G Use Cases 5G 5G Leaders 5G Companies More

5G MAGAZINE BY TECKNEXUS

CHALLENGE

WHAT WERE THE CHALLENGES?

Once the use cases are successfully validated, some of the challenges that the industry need to address include:

- Implementation of the use case across telco networks and countries, including application portability
- Accelerate technology development and commercial adoption of the use cases in partnership with the automotive industry
- Provide seamless and tailored customer experience
- Fulfill data privacy and regulatory requirements

APR 2022 | #12

HOW ARE YOU MITIGATING THE CHALLENGES?

CAMARA - The Telco Global API Alliance

CAMARA project was launched early this year to mitigate the above challenges. The project goal of the project is to enable seamless access to 4G/5G network capabilities through APIs.

4G/5G functions let you extract information from the network and set it up. These capabilities' on-demand, secure, and controlled exposure will enable operators to build service enablement platforms that allow for the integration of applications with networks and the provision of better customer experiences in the 5G era.

Abstraction from Network APIs to Service APIs is necessary:

- To hide telco complexity making APIs easy to consume for customers with no telco expertise (user-friendly APIs)
- To fulfill data privacy and regulatory requirements
- To facilitate application to network integration

Availability across telco networks and countries is necessary:

- To ensure a seamless customer experience
- To accelerate technology development and commercial adoption (minimize implementation effort)
- To accelerate education and promotion
- To support application portability

Abstraction of Internal API to Service APIs

1 Capabilities: Capabilities via Network APIs (e.g. 4G/5G, network management, etc.)

2 Exposure: Exposure of Service Functions via Service APIs (e.g. 4G/5G, network management, etc.)

3 Service APIs: Service APIs (e.g. 4G/5G, network management, etc.)

4 Technical Harmonization (optional): Technical Harmonization of Service APIs (e.g. 4G/5G, network management, etc.)

5 Interoperability: Interoperability (e.g. 4G/5G, network management, etc.)

Image Credit: CAMARA | Abstraction API Architecture

CAMARA is an open-source project within Linux Foundation to define, develop and test APIs. CAMARA collaborates with the GSMA Operator Platform Group to align API requirements and publish API definitions and APIs.

CAMARA is closely aligned with standardization organizations like TMForum or ETSI MEC.

Harmonization of APIs is achieved through fast and agile created working code with developer-friendly documentation. API definitions and reference implementations are free to use (Apache2.0 license).

For more information or to get involved, go to gsma.com/camara.

12-13 / 33 + @issuu

9

Project governance updates

OPAG representation of CAMARA



Nomination of candidates until next meeting:

Please include your proposals here:

https://github.com/camaraproject/rep_main/blob/main/documentation/MeetingMinutes/OPAG_Representation.md



Sub project status

“Quality on Demand”

Scope:

- Service APIs for “Quality on Demand” (see APIBacklog.md)
- It provides the customer with the ability to:
 - set quality for a mobile connection (e.g., required latency, jitter, bit rate)
 - get notification if network cannot fulfill
 - NOTE: The scope of this API family should be limited (at least at a first stage) to 4G and 5G.
- Specify, develop, document and test the APIs (with 1-2 Telcos)
- Schedule: from now to 30.06.2022
- Location: virtually

Team / Maintainers:

- DT: Shilpa Padgaonkar, M. Jarzab, M. Sozanski, N. Wirzius, F. Dsouza
- Intel: Petar Torre, Francesc Guim
- Telefonica: José Antonio Ordoñez Lucena
- Telus: Ali Tizghadam
- Ericsson: Emil Zhang, Jan Friman, Joachim Dahlgren
- KDDI: Toshi Wakayama
- MobileX: Christoph Goertz, Thomas Vits
- Orange: Sylvain Morel, Patrice Conil, Julien Giannandrea
- Vodafone: Eric Murray, Kevin Smith, Ivan Nieto

Repository (incl. first draft API specs): <https://github.com/camaraproject/QualityOnDemand>

GitHub
issue #1

GitHub
issue #2

GitHub
issue #6

GitHub
issue #7

GitHub
issue #8

GitHub
issue #9

GitHub
issue #11

GitHub
issue #12

Meeting minutes
in the repository

Sub project status

“Quality on Demand”

Deliverable	Required/Optional (R/O)	Current status
API Definition	R	Done
API doc/user stories/testcases	R	Commonalities' relevant templates have been delivered – alignment has now started (issue #12)
Implementation	O	In clarification: <ul style="list-style-type: none">Verifying reference NEF implementation applicability
API Reviews and extensions		<ul style="list-style-type: none">Reviews from WG members discussed and worked on using issues in Github.Proposal for QoS profiles mapping under review

MILESTONE #1

Working group status

“Commonalities for APIs”

Scope:

- Work out “Commonalities for APIs”
- Schedule: from now to 30.06.2022
- Location: virtually

Team / Contributors:

- DT: Shilpa Padgaonkar, Mariusz Sozanski
- Telefonica: Jose Ordoñez-Lucena, Ruben Barrado Gonzalez
- Intel: Petar Torre, Francesc Guim
- Ericsson: Jan Friman, Miguel A. García-Martín
- KDDI: Toshi Wakayama
- Orange: Sylvain Morel, Olivier Mathieu
- TIM: Fabrizio Moggio
- Vodafone: Kevin Smith, Eric Murray, Ivan Nieto
- AT&T: Shahram Mohajeri
- MobileedgeX: Thomas Vits, Christoph Goertz
- GSMA: Faisal Zia, Tom van Pelt, Mark Cornall

Repository

- <https://github.com/camaraproject/WorkingGroups/tree/main/Commonalities>

Meeting minutes
in the repository

GitHub issue #1	GitHub issue #3
GitHub issue #4	GitHub issue #5
GitHub issue #6	GitHub issue #7
GitHub issue #8	GitHub issue #9
GitHub issue #10	GitHub issue #11
GitHub issue #13	GitHub issue #25
GitHub issue #26	GitHub issue #27
GitHub issue #31	GitHub issue #32

Working group status

“Commonalities for APIs”

Deliverable	Format	Main Contributor	Current status
User story template	Word	Telefónica	Review closed Document accepted
API documentation template	Markdown	DT	Review closed Document accepted
Authentication and Authorization concept doc	Markdown	DT	Document prepared Review in progress
Testing principles doc	Markdown	DT All	Document in progress
Standard resource description doc (Glossary)	TBD	E/// All	To be started
General principles doc (Incl. software engineering process)	Markdown	Telefónica All	Document prepared Review started
Exposure reference solution	Word	Telefónica	Review to be closed
API readiness minimum criteria checklist	Markdown	DT	Review to be closed
NEF reference solution	Source code	Intel	Checking applicability
Dedicated portal instance for Camara	<i>Platform</i>	Telefónica	Proposal under discussion

Working group status

“API Backlog”

Scope:

- Include contribution from OPAG and from Ericsson
- Schedule: from now to 30.06.2022
- Location: virtually

Team / Contributors

- Ericsson: Jan Friman
- Telefonica: Jose Ordonez-Lucena
- KDDI: Toshi Wakayama
- Vodafone: Kevin Smith, Eric Murray, Ivan Nieto
- Scenera: Andrew Wajs

Repository

- <https://github.com/camaraproject/WorkingGroups/tree/main/APIBacklog>

GitHub
issue #2

GitHub
issue #12

GitHub
issue #19

GitHub
issue #20

GitHub
issue #21

GitHub
issue #29

GitHub
issue #30



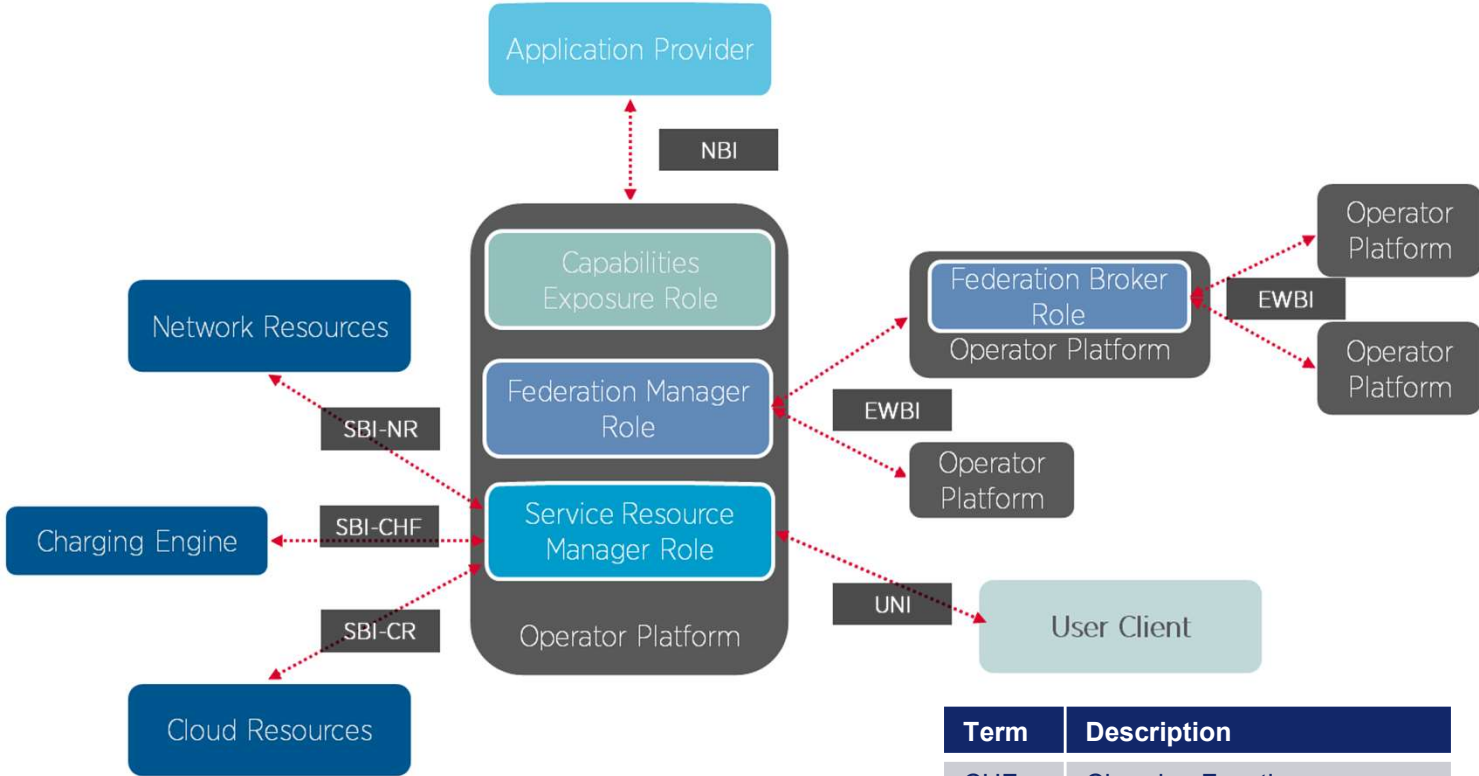
OPAGxCAMARA

Topics and Functionality prioritisation

Alex Harmand, Telefonica & OPAG Chair

14 April 2022

Reminder: Operator Platform - architecture



Term	Description
CHF	Charging Function
CR	Cloud Resources
EWBI	East/Westbound Interface
NBI	Northbound Interface
NR	Network Resources
SBI	Southbound Interface
UNI	User Network Interface

- Other interfaces needed as well, e.g.
 - edge resources ⇔ application
 - Cloudlet ⇔ Cloudlet
 - Device Application ⇔ UE/UNI
- Not all covered in depth given focus on OP
- Note: SBI-CR defined as flexible to fit in with orchestration and hyperscaler solutions used in different networks

Value of OP for edge computing and other capabilities

The OP makes them a true interoperable operator service



Single entry point to subscribers serviced by all federated OPs

Similar to business voice call do not require connection to each MNO to reach user base
i.e. extends geographic and user base that is offered by MNO/OP provider
Requires alignment in service offered, e.g. similar compute profiles offered

Service in roaming and while mobile

- Similar to voice calls reaching subscribers wherever they are and while on the move
- Edge requires use of nearby compute resources that follow user when moving
 - Ideally with smooth handover between networks cross-border
- Requires the integration with the (packet) core network provided by the OP

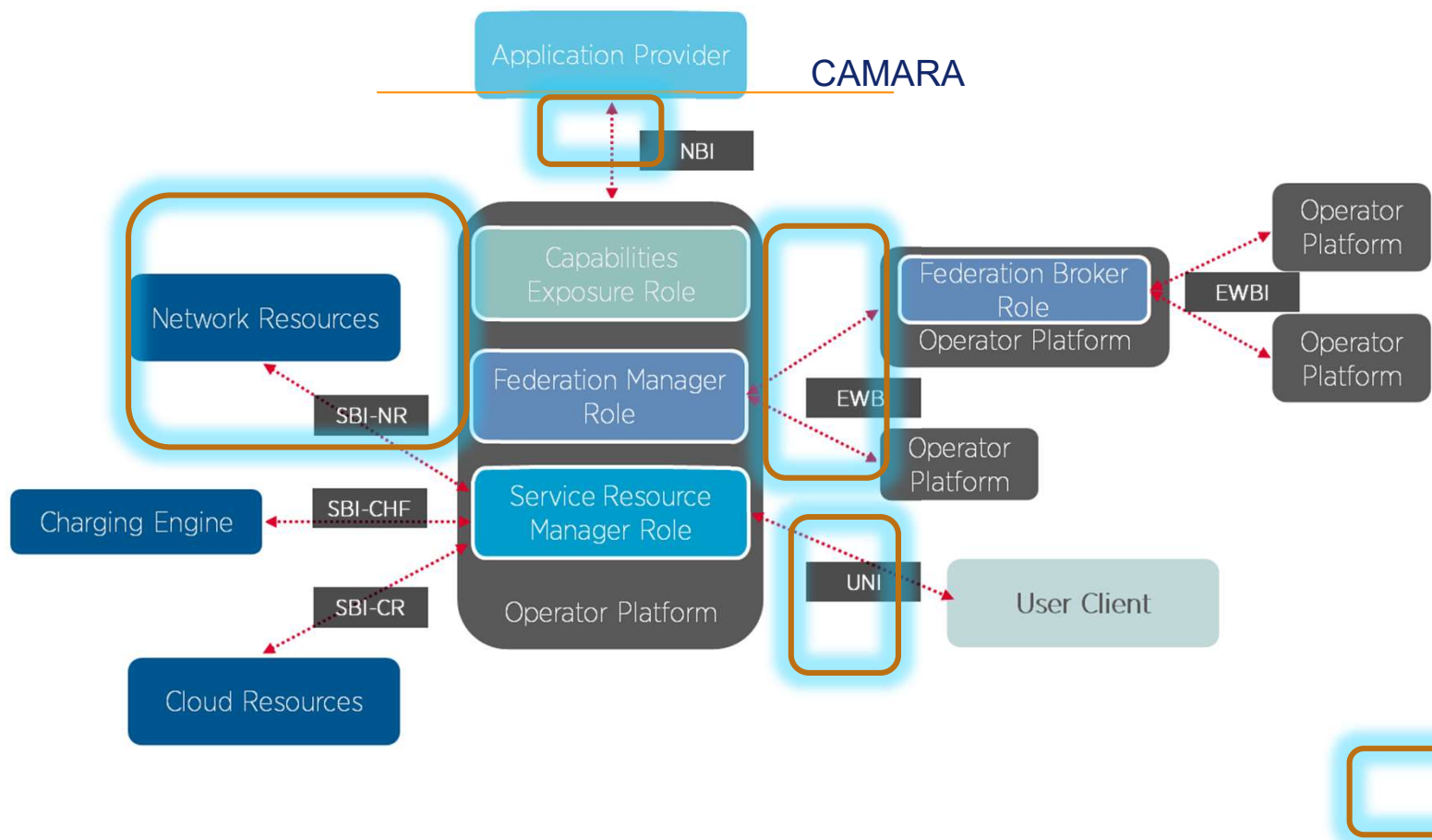
Can link of capabilities of different operators

- Similar to voice calls between subscribers on different operators
- Edge applications serving subscribers on different networks may have to interact
 - e.g. gaming against each other or automotive applications cooperating to improve accuracy

Disconnects service offering from capabilities

- Similar to voice call service relying on multiple network capabilities
- Developers may need an offering combining different capabilities
 - e.g. Edge with NaaS and/or slicing
- OP providing access to all capabilities allows to break silos and merge capabilities into a single offering

OP offers clear differentials



Key platform differentials are in federation, network integration and northbound exposure capabilities

Priority in ensuring interface definition for these concepts

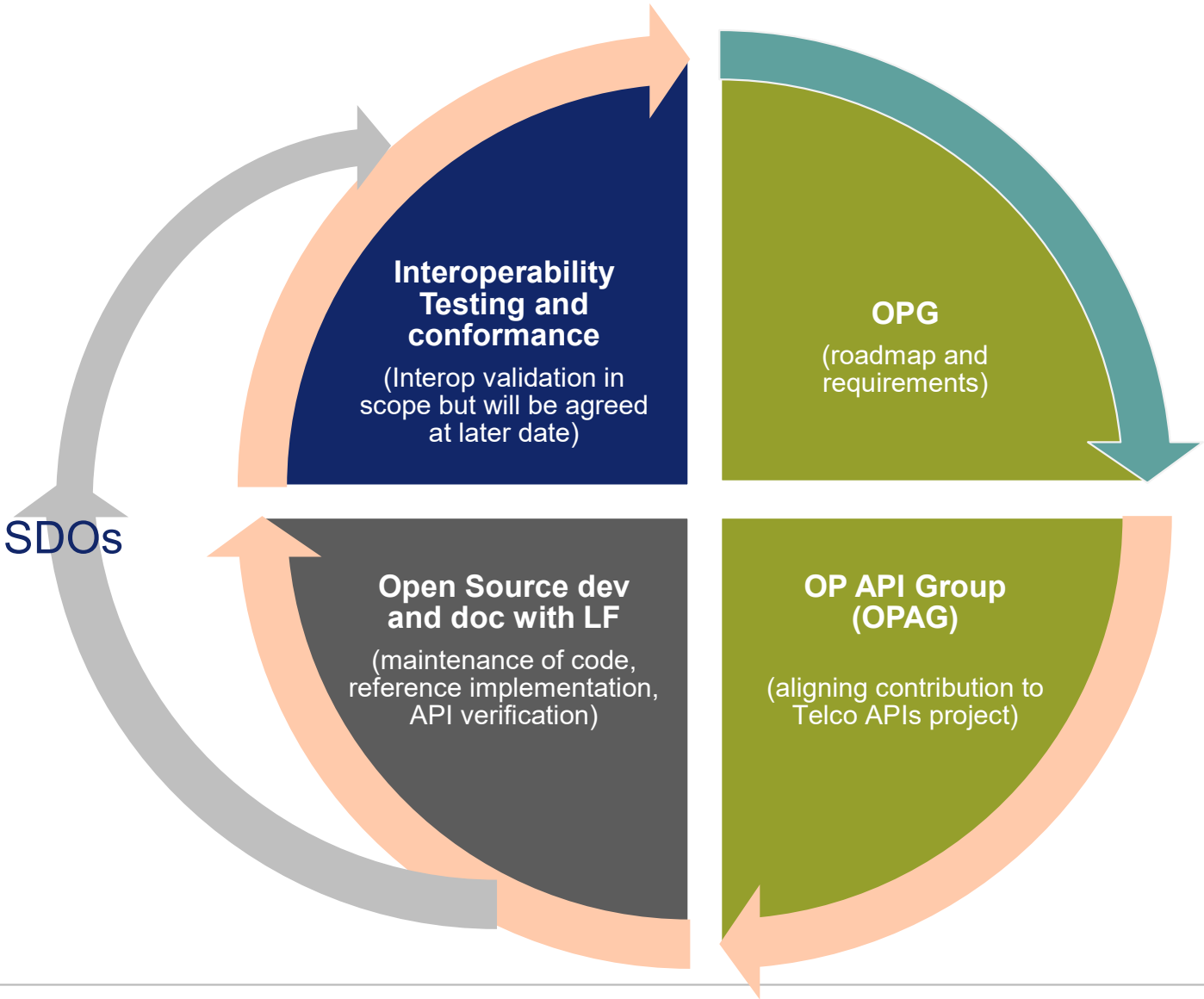
CAMARA relevance for OPAG

OPAG is in charge of defining the interfaces required by the Operator Platform concept. Northbound capability is one of the main differentiator where service APIs shall be built to foster platform adoption and usage by customers or developer community.

Collaboration with CAMARA is by OPAG as the way for service APIs and northbound definition and ensure that GSMA priorities and demand can be met.

A review of GSMA priorities should be done. A first northbound API package shall be tackled as a blue print in order to validate way of working and process between CAMARA and the GSMA

Against a life cycle towards service API development



NOTE: API Subgroup and CAMARA Development output is to deliver a harmonized set of APIS for interfaces and where appropriate functional blocks, and **NOT** a full platform.

To support standardisation efforts, SDOs will receive two drops:-

- 1) Requirements after publishing
- 2) update based on additional requirements and/or documentation on APIs from implementation

Interop testing may cover standards when available.

OP NBI: APIs

OPAG identified following APIs as part of the OP’s Northbound Interface:

API	Description
Application onboarding and image management	Provide and manage application images to be deployed on resources within the operator network
Application Instance Management (Resource Life-Cycle Management)	use reserved compute resources within the operator network for the deployment of applications on VMs or Containers
Telemetry	Track usage and load of resources/capabilities used within the operator network
Notifications	Be informed about events related to reserved/used resources/capabilities
Network Events	Be informed about events related to users/subscribers using the reserved/used resources/capabilities
Trouble Ticketing	Inform network(s) of issues arising around resource/capability reservation/usage
Application Resource Catalogue	Retrieve information on available resources and capabilities
Ordering	Reserve the use of resources/capabilities
Charging	Access charging capabilities of the network
Billing	Retrieve bill/billing data
QoS Management	Control QoS profiles used for user/subscriber access to application
Traffic Influence	Influence routing and mobility policies for traffic associated to application
Managing Service availability in LADN	Manage area where application should be available
Application relocation	Manage the relocation of a user session to another resource
Confirm User Location	Confirm whether the user is at a given location



Background: Prioritisation

OPAG prioritised the APIs to propose to CAMARA resulting in the following:

Priority	Topic
1	Application onboarding and image management
2	Application Instance Management (Resource Life-Cycle Management)
3	QoS Management
4	Telemetry
5	Traffic Influence
6	Network Events
7	Confirm User Location
8	Notifications
9	Application Resource Catalogue
10	Charging
11	Application relocation
12	Billing
13	Trouble Ticketing
14	Ordering
15	Managing Service availability in LADN

Process

Collaboration process to be built. To be covered in commonalities?

OPAG will highlight the system/ network API mapping to be considered.

Process for service API to network API definition?

Priority APIs for GSMA handling?

Proposal

Based on priorities, OPAG will look into proposing APIs for edge applications to CAMARA

- Image and application instance lifecycle management
- Used as blue print to kick things of

Will be taken up once activities on defining APIs for federation have completed

- Current timeline estimation: from May onwards

Proposal to start an edge work stream to handle such contributions and align them

Build process on the findings made from the exercise

Further topics would then follow later

Decided to implement
a sub project for
Edge Cloud APIs

Proposals for API sub projects



Vodafone will send a proposal for

- Customer identification
- Roaming status



TM Forum API Mapping will

- Be addressed to commonalities working group



Telus will send a proposal for

- Sovereign route
- Emergency response API family

GitHub
issue #33



CAMARA

The Telco Global API Alliance

A0B