

Emerging Technology Group: Private Network Blueprints

Ravi Sinha (Chair-ETG/Jio)
Prabhakar Chitrapu (Chair-SCF)



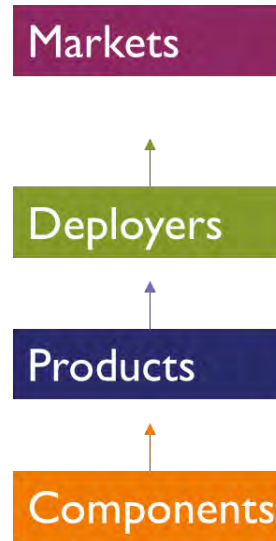
MOBILIZING
ENTERPRISES &
COMMUNITIES



5G Enterprise Pvt NW Blueprint Initiative

- ❑ Small Cell Forum is developing a series of technical and deployment blueprints that will address an important gap in the mobile networks market.
- ❑ These Blueprints will provide common reference designs and deployment processes that reduce the time, cost and risk of developing a small cell network.
- ❑ While based on standard specifications, the blueprints will be specific to certain roll-out scenarios that are not currently addressed by the frameworks of other organizations

Small Cell Ecosystem



SCF Initiatives

Market forecast
Market advisory council

Hosted Open RAN
Private Network Blueprints



RF Reference design





5G Private NW Blueprint: Multiple Communities Common Goal

- ❑ SCF has published its FAPI/Network-FAPI Specs in June 2021. This release provides an opportunity for the industry to build a disaggregated 5G open-RAN around Split 6.
- ❑ This is a steppingstone to not only 5G Service based NW design and Product Packaging, but also to cloud native infrastructures.
- ❑ SCF has initiated baseline research and strategy framework to develop Private Cellular Network Blueprints and System & Test framework in partnership with the Small Cell industry, MNOs, OEMs, Hyperscalers, Integration and Test Vendors, Infra and Component vendors.
- ❑ Presentation briefly expounds on these concepts of 5G Private Cellular Network Blueprints and highlights the partnership ecosystem. The Blueprints are developed for IaaS, PaaS, NFaaS, System Integration and Test Frameworks.

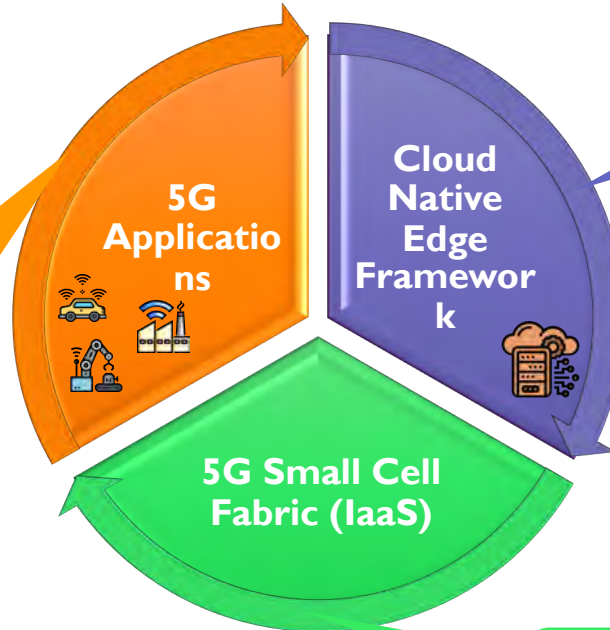
| Ecosystem Stakeholders | SCF's Blueprint Value-Proposition |
|------------------------|--|
| MNO | Interfaces, IaaS, PaaS, NFaaS, MaaS, TaaS, SaaS, MVP, Certification and Badging Framework, Governing Body, Product Packaging, BP |
| OEM | Interfaces, IaaS, PaaS, NFaaS, MaaS, TaaS, MVP, Certification and Badging Framework, BP |
| Test Solution Vendors | TaaS, MVP & Market Place |
| System Integrators | SaaS, TaaS, Product Packaging, Reference Design, Market Place |
| Automation Vendors | MaaS, TaaS Framework, Market Place |
| Infrastructure Vendors | IaaS, PaaS, MaaS, SaaS, TaaS Framework, Market Place |
| Component Vendors | Part of IaaS or PaaS, NFaaS, TaaS Framework, MVP, BP, Market Place |

5G Private NW BP : Scope and Framework



PN blueprint and Framework will help the industry build a package out of our contribution and Partnership

Multiple Verticals can be initiated within SCF ETG to cater each section of the Application framework: Automotive, Industry 4.0, Infotainment etc.



Private NW BP and its Edge asset will focus on Cloud native framework

Private NW Blueprint will create a complete Ecosystem around the Small Cell Fabric.



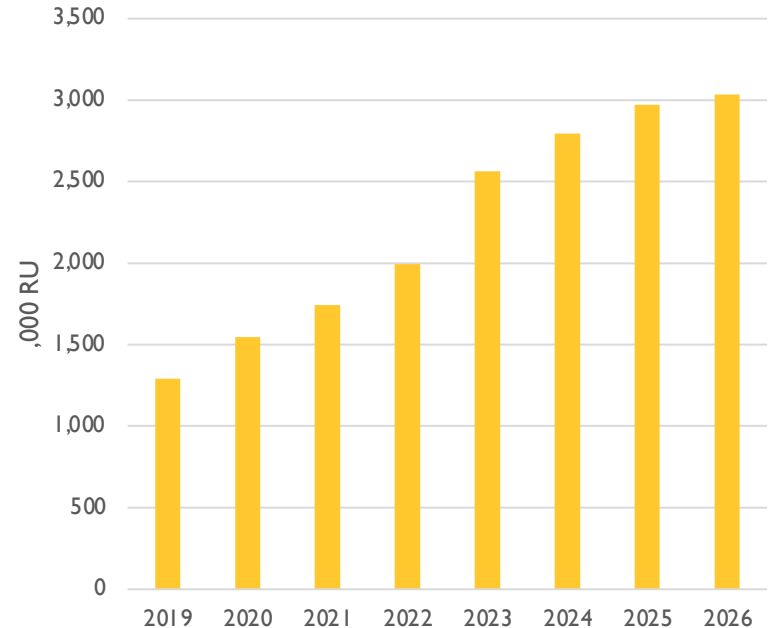
Constituents of Blueprints – Component, Module and E2E

| Blueprint level | Document proposed | Description |
|-----------------------------------|------------------------------------|---|
| Product | Minimum viable Offering (MVO) | Optimal features needed to package a blueprint for initial proof of concept or trials |
| Component | Product requirement document (PRD) | Product specifications to meet the engineering product development needs and further split into SSRD (Sub-System Requirement Document) |
| Module | Reference design | Baseline subsystem design (HW+FW+SW) as a building block for a complete platform |
| E2E (Use case & Service Offering) | Individual blueprints | Use case description and blueprint for one or more service offerings (e.g. IaaS). Each blueprint consists of E2E functional and protocol stack architecture and links to reference designs (as above) |

Private networks have high potential for small cells, and blueprints could help unlock that



- The fastest growing area of small cell deployment is in private enterprise networks (SCF forecast – see right)
- However, there are barriers. 36% of deployers said they would roll out more quickly if more plug-and-play deployment were enabled.
- Enterprises are accustomed to certification in other networks and will demand the same for cellular



Ref: SCF's survey of operators and other deployers, and its *2021 Market Forecast*

Comparing selected industry blueprint initiatives focused on cellular and/or private networks

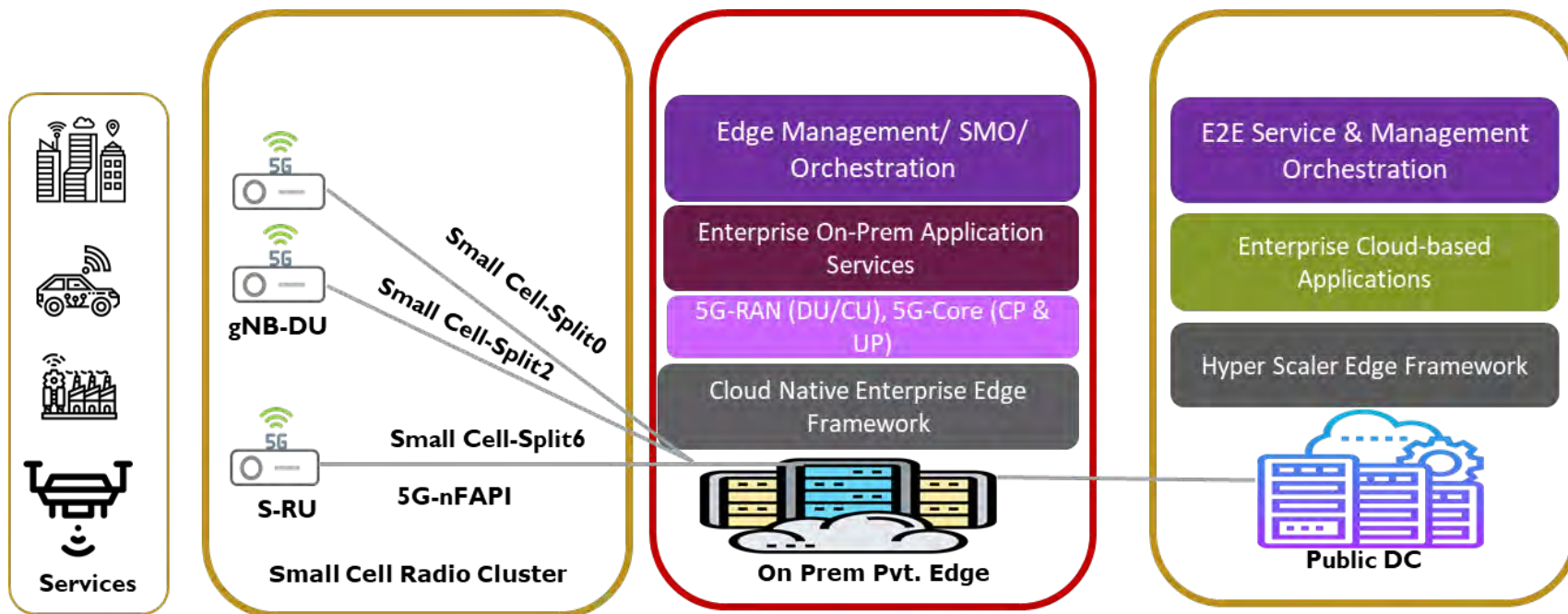


| Industry Blueprints (Private networks) | Difference to SCF's blueprints |
|---|--|
| Telecom Infra Project (TIP) Private Networks Blueprint | Focused on Split 7.2 (O-RAN) and macro solutions |
| OAISA Private Networks Blueprint | Focused on Split 7.2 and on macro or micro base stations. An opensource initiative with academic and PoC focus |
| 5G Automotive Association (5GAA) Private Networks Blueprint | Edge architecture for automotive, focused on vehicle unit and surrounding infrastructures |
| MulteFire Alliance Uni5G Blueprints | Focused on common PLMN ID for industry networks in shared spectrum |

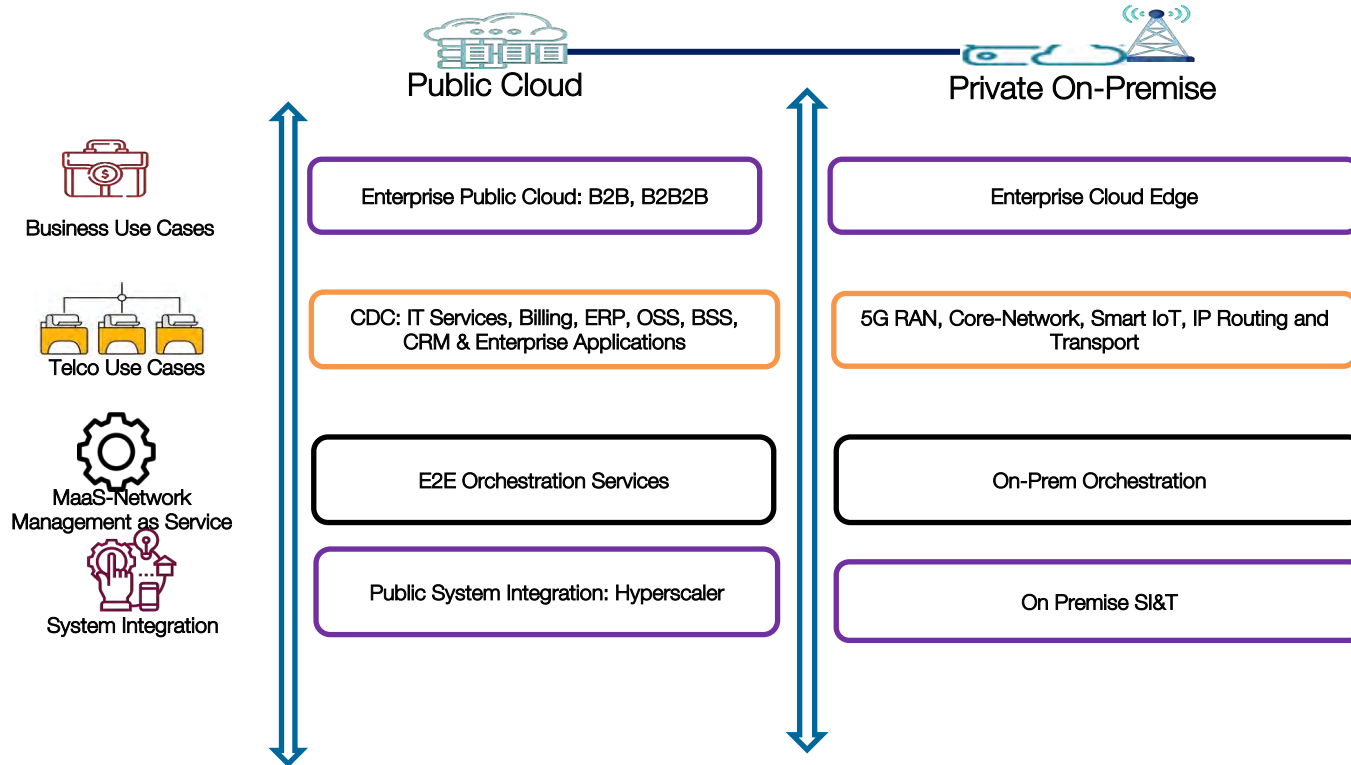
There is a clear gap for a private network blueprint focused on small cells



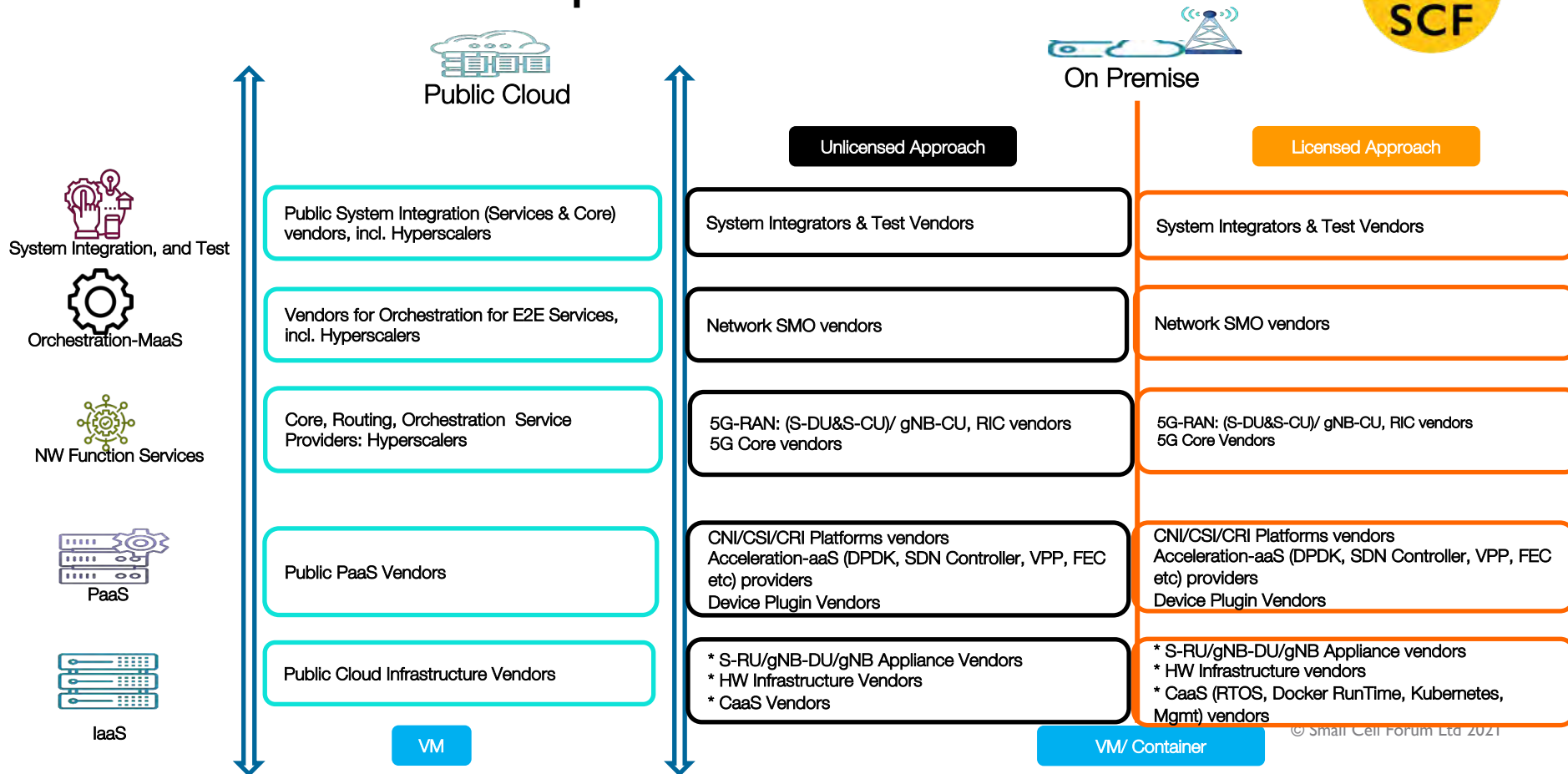
Functional layout of Dedicated Enterprise Pvt SC NW



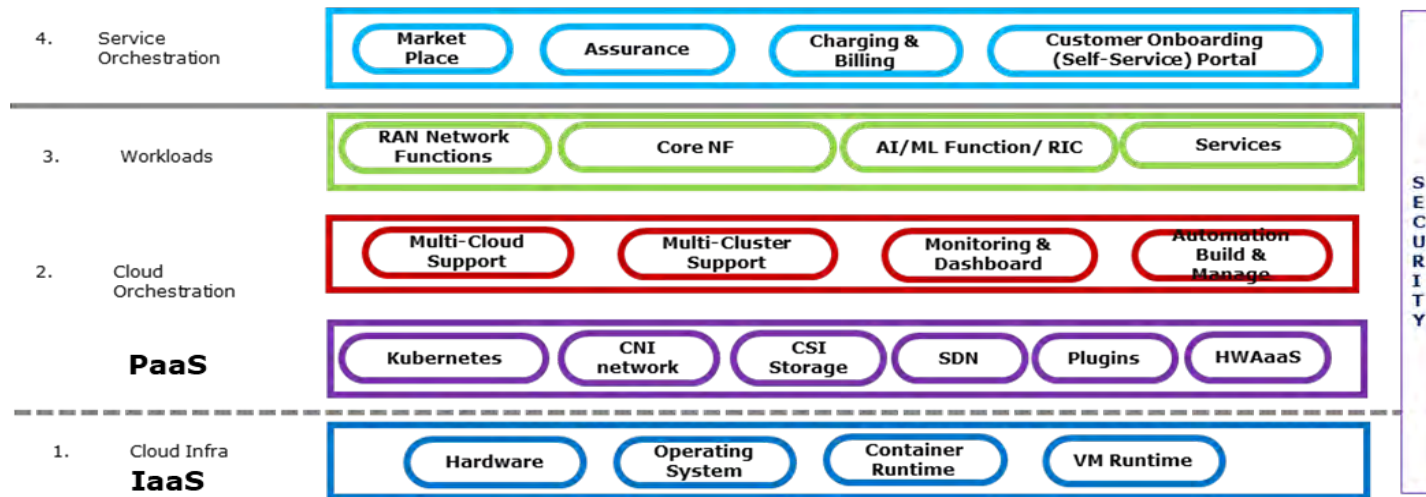
Business Case Opportunities Enabled by Pvt NW BP



Enterprise 5G Private Cellular Network (Phase I): Solution Framework w/ Example Stakeholders



SCF Cloud Native Framework for 5G Network Functions and Services



5G Cloud Native Stack



Disruptive Service Slicing with SCF's Lower Layer Split

5G Pvt Enterprise Network Blue-Print –Status



1. 5G Pvt Ent NW BPWG is working on the MVO Architecture and content.
2. Year 2022 already had 19 weeks of discussion and contribution to form the teams, defining the framework of documents, which will feed to the MVO and assigning it to different sub-groups and collaborating with SDO.
3. In these 19 weeks we have already worked heavily on MVO Architecture, structure of the document, Content and how to integrate the MVO to the set of MVPs from SCF components like FAPI, nFAPI, 5G Sub 6GHz Reference Design, Neutral Host as well as Open6 Design and Deployment platforms as well as positioning the individual MVPs coming from Cloud infra/ Platform, Orchestration as well as Test, integration and Certification..
4. We have created 10 base line docs which will complement each other.
5. 40% work is completed.
6. Team is also working on collaboration with industry, academia and some of the forward-thinking Open interface and source forums to move this BP initiations to the next stage.



Deliverable Roadmap

• Phase-I

- Enterprise 5G Pvt NW (Isolated) IaaS, PaaS, NFaaS, MaaS, SaaS Sub-blueprint delivery.
- MVP, PRD, Ref Design,
- Test Frameworks.
- Badging and Certificates
- Projected Delivery TimeLine: Q3-2022.

Note: A complete Outline and Strategy for the Blueprint (Phase I) is the part of this presentation.

• Phase-2

- Enterprise 5G Pvt NW (MNO) IaaS, PaaS, NFaaS, MaaS, SaaS Sub-blueprint delivery.
- MVP, PRD, Ref Design,
- Test Frameworks.
- Badging and Certificates
- Projected Delivery TimeLine: Q2-2023

Note: Team is working on the Outline and Strategy for the Blueprint (Phase II) and will be available soon.

• Future (→CV2X →Industry 4.0)

Thanks



MOBILIZING
ENTERPRISES &
COMMUNITIES