



PRIVATE NETWORKS: WHAT ARE THE KEY COMPONENTS REQUIRED?

Deploying private network is complex and requires different components and capabilities from the supply side ecosystem. In this article, we explore what these components and capabilities are in more detail.

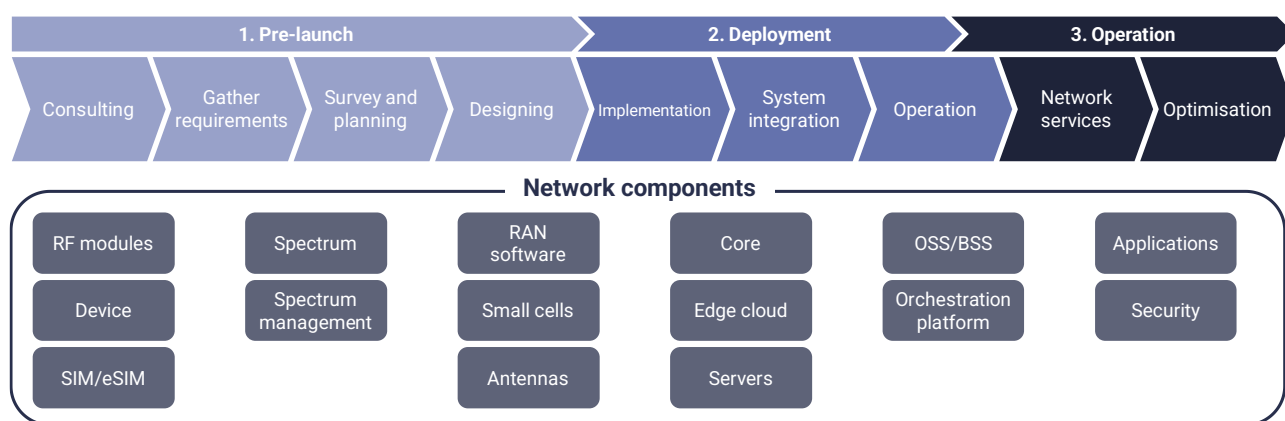
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What are the components that go into building a private network?

Building, deploying and managing a private network is an inherently complex process. Private networks require customisation to customers' requirements. There are many activities (and parties) that are involved and also many pieces that make up a private network.

In our recent report [The private networks ecosystem: Who to partner with](#), we highlight the activities and network components in the diagram below:

Figure 1: Private network activities and network components



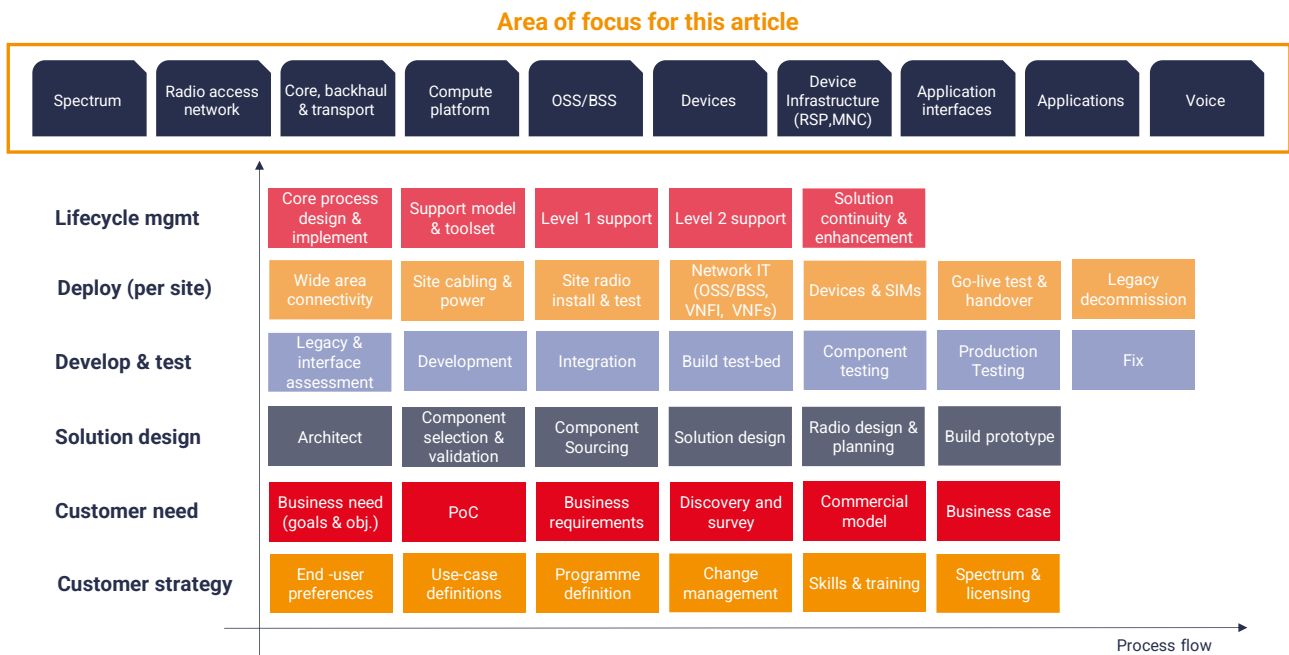
We outline these many elements below, including:

- **Spectrum:** Can be shared spectrum (e.g. in the US with CBRS), public spectrum (e.g. via mobile network operator), unlicensed spectrum or industrial spectrum (allocated by the regulator specifically for industrial use)
- **Radio access network:** Small cells and other types of radio access equipment are critical components in the private network infrastructure. In most cases, the small cells are deployed on premise but with the emergence of hybrid models, the enterprise customer can leverage a dedicated slice of the public radio access network
- **Mobile packet core:** either a 4G evolved packet core (EPC) or 5G standalone core, which can be deployed via a dedicated model on the customer premise or can utilise a shared core. Although a significant proportion private network deployments are primarily LTE-based and have used virtualised but not cloud based mobile cores, upcoming deployments are leveraging cloud based cores
- **Compute platform:** on-premise platform (edge or dedicated private cloud), edge cloud platform or the public cloud
- **OSS/BSS:** Associated software to manage the private network operations, typically can be fairly lightweight and potentially cloud-delivered given the scope of the network and number of users is significantly lower than most public networks. This will increasingly become more important as enterprises start to think about multi-tenancy for their private networks, traffic prioritisation of certain mission-critical devices or even eventually slicing their own private network for this.
- **Devices:** These are application specific but can include smartphone-type devices, IoT sensors and modules and more, and have to be available in the specific spectrum band(s) used for the private network.

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- **Device infrastructure:** Includes device management platforms, remote SIM provisioning (RSP), MNC (mobile)
- **Applications and application interfaces:** Can include more horizontal use cases like push-to-X (talk, video, message) to more vertical specific use cases like remote gantry crane operations in ports or
- **Other:** Professional services and systems integration, voice support (e.g. where telephony or push-to-talk applications are required, own IMS and VoLTE may be required for the private network),

Figure 2: A detailed view on the step by step activities



In a separate article, we will dive into the different architectural models for private networks.

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