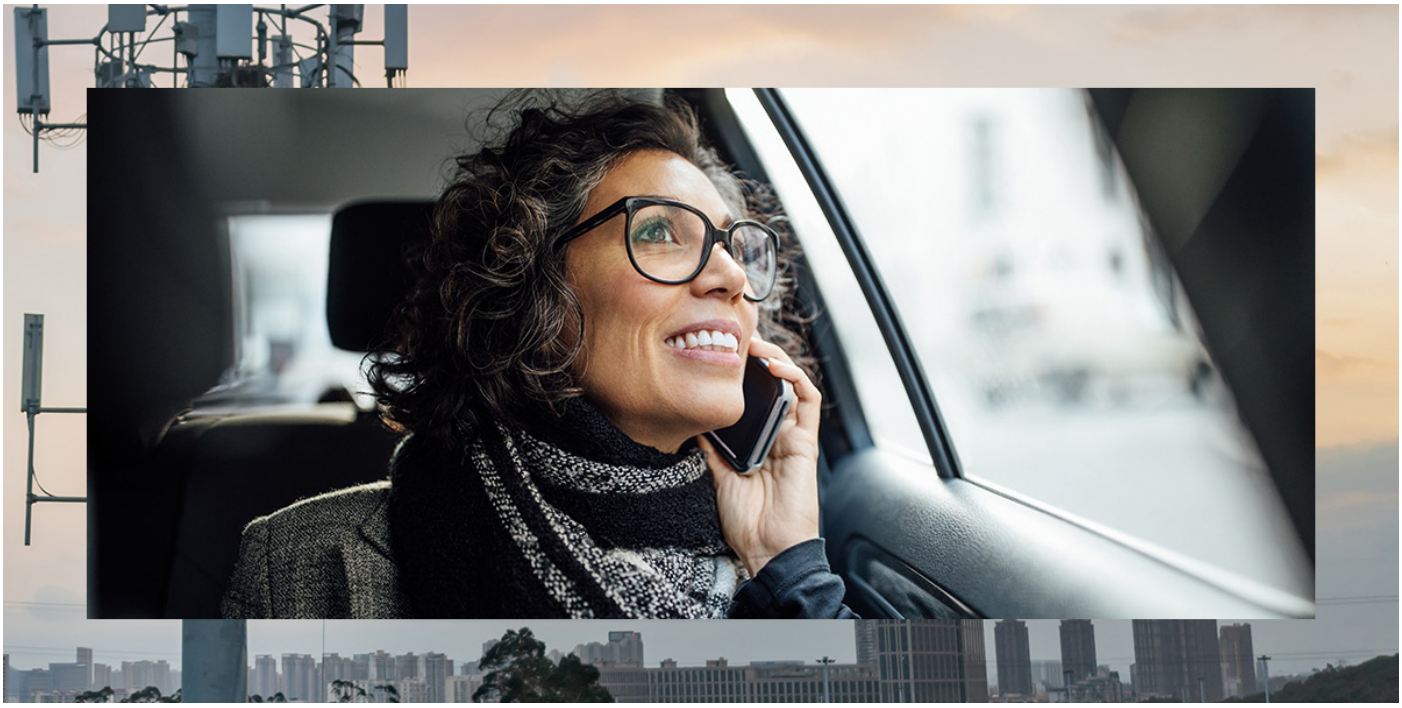
# Private mobile networking solution from HPE for Federal and State and Local Agencies

Offer flexible private networking solutions for diverse agency needs and use cases



**Private Mobile Networks (PMNs) have become a high-value connectivity option for organizations across multiple verticals—and a compelling new connectivity option for military and civilian agencies. With solutions from Athonet, a Hewlett Packard Enterprise acquisition, they can leverage a flexible, comprehensive PMN solution to meet diverse customer requirements and deliver networks at scale.**

## New requirements at the edge

Organizations in every industry are deploying new edge applications to digitally transform their business. These applications can unleash valuable new business capabilities—connecting remote equipment, automating operations, applying real-time AI-driven decision-making, and more.

At the same time, many new edge applications bring more specialized and stringent connectivity requirements. Depending on the use case, governmental agencies may require:

- **Wide-area coverage**, with the ability to transmit and receive over greater ranges
- **High-speed mobility** to connect robotics and automated vehicles indoors and out
- **Ultra-reliable connectivity** to keep mission-critical applications online, even without access to public networks
- **Policy-driven performance, latency, and quality** to support next-generation edge applications such as autonomous vehicles and real-time AI decision-making
- **Spectrum flexibility** to protect critical applications from local RF interference
- **Enhanced security and privacy** with the ability to use dedicated networks
- **Device level control** with subscriber identity module (SIM)-based authentication

Federal, state, and local agencies can't meet these new edge requirements with Wi-Fi networks alone. Private 4G/5G networks offer an excellent solution to complement Wi-Fi infrastructures and tailor connectivity for diverse use cases.

## Customized PMN solution from HPE

HPE can provide a highly flexible, customizable PMN solution to address a wide range of industries and use cases. Based on award-winning Athonet mobile core technology, it combines a comprehensive 4G, 5G, and IP Multimedia Subsystem (IMS) feature set to support deployments of any size. The solution also offers a variety of flexible hardware choices, architectural models, and deployment options (Figure 1).

Whether choosing a preintegrated PMN offering or working with HPE to build their own, based on our mobile core technology, organizations can leverage:

- **Stand-alone "5G in a box" solutions** that enable autonomous operation—even without access to the internet or a public cellular network—for tactical and remote deployments
- **Distributed private 4G/5G networks** that address specialized latency, performance, and resiliency requirements for edge applications
- **Virtual dedicated networks** over public cellular infrastructure, effectively enabling network slicing for service providers that have not yet migrated to 5G stand-alone networks

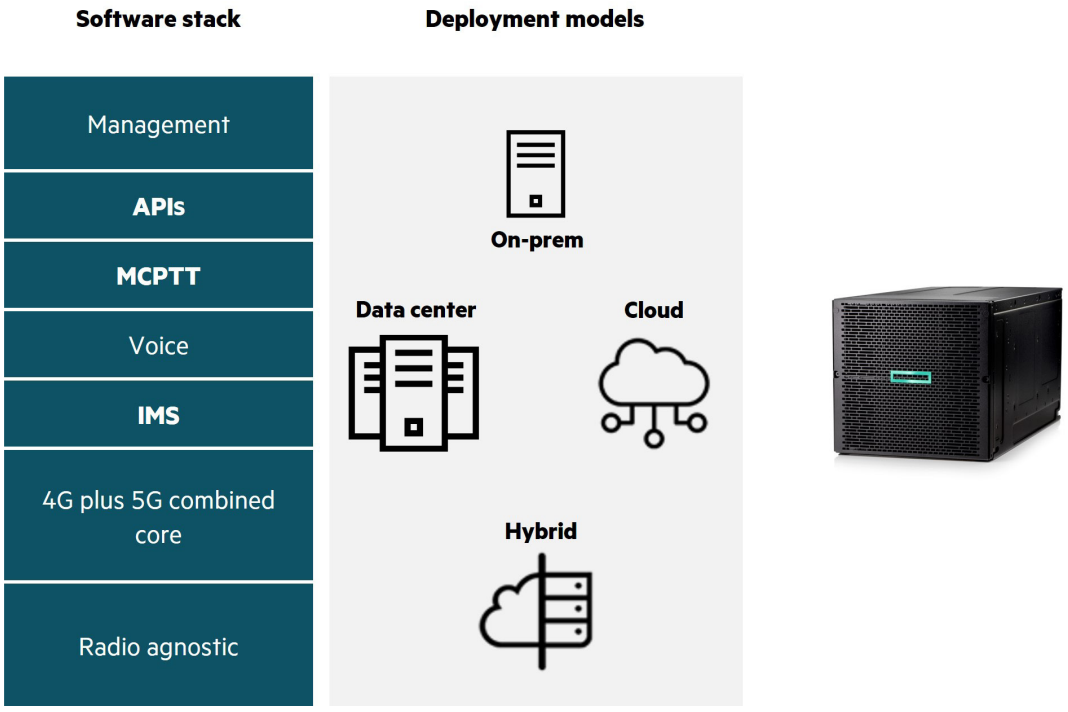



**Figure 1.** A complete, modern private mobile networking that's extensible and customizable to any use case

For all deployment types, the solution's complete 4G/5G/IMS core stack delivers ascertain mission-critical connectivity and voice quality for a broad range of use cases and customers. The solution provides:

- **Deployment simplicity:** PMN solution from HPE provides greater flexibility to address centralized cloud deployments, fully autonomous stand-alone networks, and everything in between. Agencies can also leverage configuration blueprints for networks to simplify deployments. By pushing out a blueprint to a new site, federal, state, and local governmental agencies and military units can have a fully configured, working local network up and running in hours. Meanwhile, the solution's northbound interface backhauls detailed parameters for each local network, so that administrators can manage distributed networks centrally as a single virtual network.
- **Performance at scale:** A virtualized software solution, our PMN can connect from 50 up to 500,000 devices and achieve speeds up to 40 Gbps while requiring a fraction of the hardware resources of other PMN solutions.
- **Flexible radio options:** PMN from HPE can use any 3GPP-standard radio under a **bring-your-own-radio-access-network** (BYORAN) model to support diverse use cases. Agencies can take advantage of the full range of 4G or 5G features, with the ability to help minimize RF interference for critical applications by customizing local spectrum allocation.
- **Mission-critical voice services:** With optional integrated IMS, the solution can deliver verified voice quality and push-to-talk / text / multimedia (PTX) connectivity for demanding tactical use cases. Even if a network's internet connection fails, the solution's patented Athonet technology can automatically scale down to an autonomous network to maintain voice and PTX connectivity for local users.
- **High availability:** PMN solution from HPE makes it simple to enable redundancy and resiliency for both infrastructure and applications. The solution's 4G/5G/IMS network functions (NFs) can use standard 3GPP redundancy capabilities or clustering. For organizations that require the highest levels of availability, the solution can also support full georedundancy for distributed deployments, protecting customer data, SIM cards, and other components with as few as four servers.

## A comprehensive customizable private network solution

Customized PMN solutions from HPE are built on mobile core technology from Athonet. Some organizations opt to create custom offerings using Athonet's open, cloud-native mobile core, while others leverage additional HPE components: 4G/5G/IMS NFs, mission-critical PTX services, network configurations—everything except the radio itself (Figure 2).

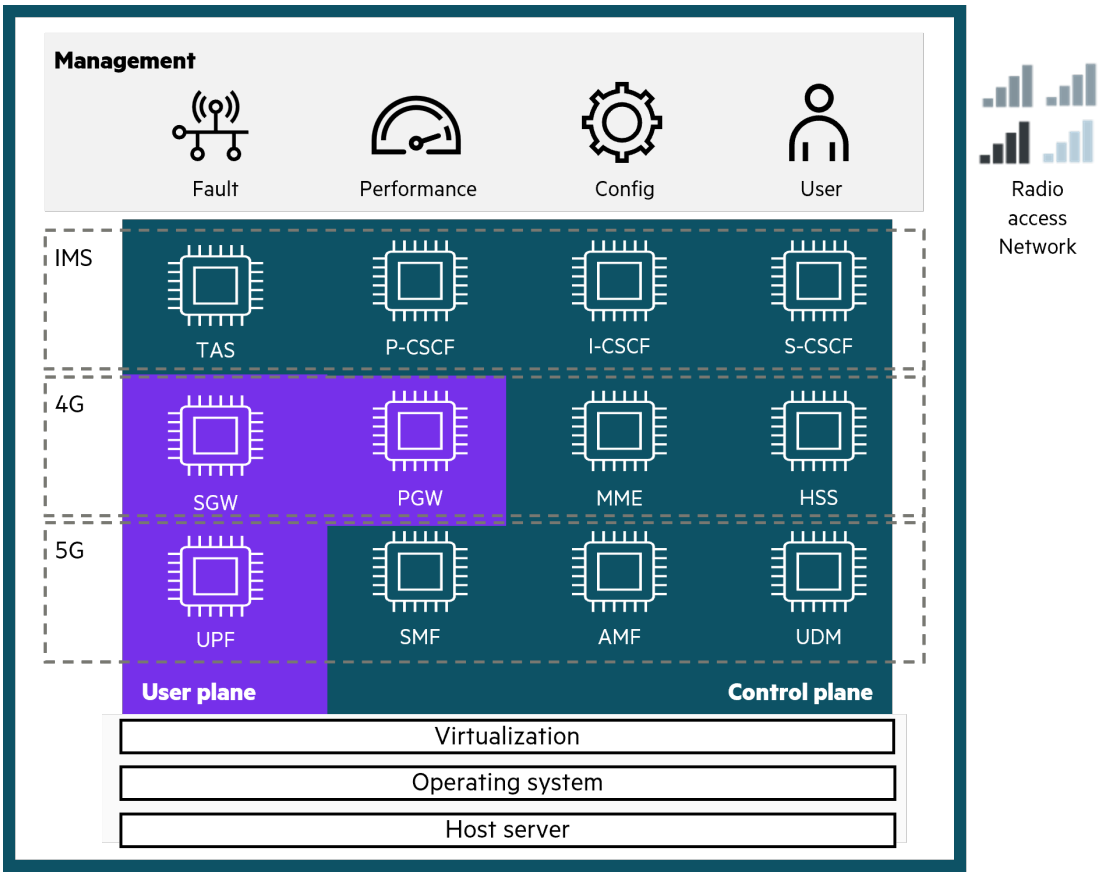



**Figure 2.** Full mobile core functionality of 4G, 5G, and IMS, complete management, and ultimate scalability

The PMNs components from HPE include:

- **Full set of 4G/5G network functions:** The Athonet mobile core included NFs enable support for diverse customers and use cases. The solution's comprehensive NFs span 4G/LTE Evolved Packet Core (EPC) networks, 5G Standalone (5G SA), 5G Non-standalone (5G NSA), and many others. (See sidebar for a full list of supported NFs.)
- **IMS:** The solution also includes optional IMS to support mission-critical voice, data, and PTX services—especially important for stand-alone deployments.
- **Pre-bundled User Plane Function (UPF):** With its included UPF, and the ability to deploy it anywhere between edge and core, the solution also comes ready to support diverse low-latency use cases. These could include a variety of scenarios such as autonomous vehicles, drones, public safety, and wide area coverage in outdoor spaces.
- **SIMs/eSIMs:** For easier deployment, SIM or eSIMs are available depending on your requirements.
- **Management dashboard with API extensibility:** The solution's full multitenant dashboard includes API extensions and user role-based access control (Figure 3).

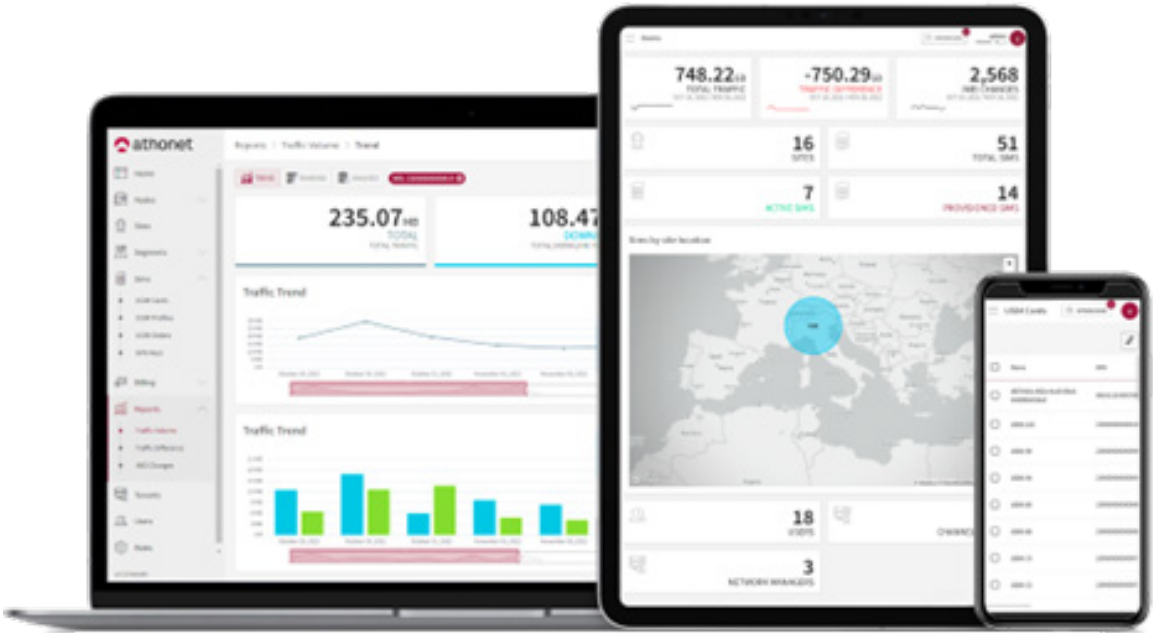



**Figure 3.** Intuitive, cloud-native dashboards for ease of management

With this range of included capabilities, the customizable PMNs solution from HPE offers both flexibility and innovation.

Most PMN solutions are either complex, build-your-own projects based on a scaled down carrier core, or solutions geared for smaller agencies, supporting only specific radios and cloud-only architectures. Alternatively, our comprehensive mobile core is designed for the enterprise with zero touch provisioning and configuration wizards all managed by a cloud-native dashboard for ease of use.

**Comprehensive 4G/5G/IMS mobile core stack**

- **4G network functions:** MME; SGW-C; PCRF/PCF; EIR; AMF; PGW-C/SMF; PGW-U/SGW-U/UPF; UDR; HSS/UDM; AUSF; NRF; CHF; SMSC; EIR
- **5G network functions:** AMF; SMF; UPF; UDR; UDM; AUSF; NRF; PCF; CHF
- **IMS network functions:** SBC: P-CSCF; IMS-AGW; CSCF: I-CSCF; S-CSCF; E-CSCF; BGCF; MMTel-AS; IP-SM-GW; VMS; AS; GMSC; PSTN-GW; XCAP; IBCF; DNS/ENUM; MRF; HSS

## Flexible architecture and deployment options

Designed for ultimate flexibility, the PMN solution from HPE can accommodate multiple architectures to suit different customer requirements. Organizations can deploy user plane, control plane, and management functions in different locations as easily as deploying a virtual machine (VM). As a result, they can support a wide range of customers, verticals, and applications with the same solution (Figure 4).

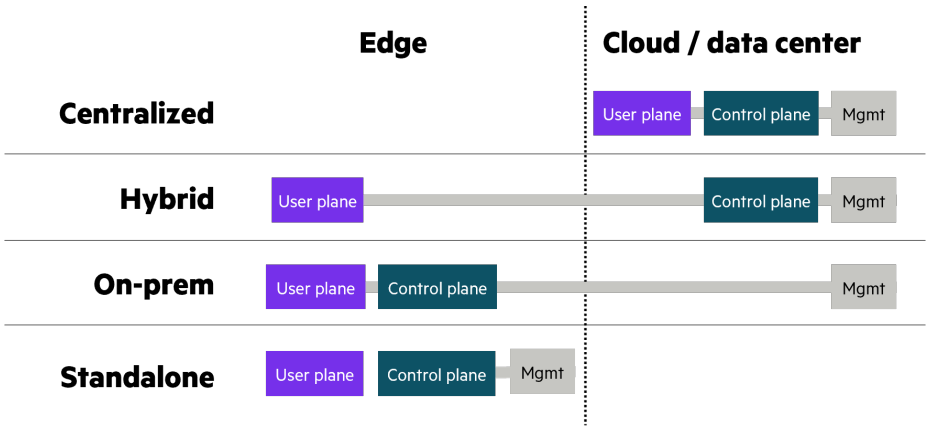



**Figure 4.** A wide range of deployment models with a PMN solution run from multiple locations across the edge and cloud

Depending on the use cases, they can support multiple deployment types:

- **Centralized:** For less critical use cases with lower traffic volumes (such as a narrowband Internet of Things [IoT] application that periodically collects data from distributed equipment), organizations need only deploy local radios. Everything else can be handled in the cloud and benefit from cloud scalability, availability, and economics.
- **Hybrid/on-premises:** Organizations can distribute user plane functions out to the edge to keep application traffic and packet-switching close to users and equipment on-premises. This model enables lower latency, customizable QoS, and seamless integration with the local infrastructure while keeping sensitive customer data on-site. At the same time, organizations can benefit from cloud scale and automation for control plane functions such as authentication and SIM provisioning, management functions, or both.
- **Stand-alone:** At the opposite end of the spectrum from centralized deployments, our PMN solution also supports fully autonomous networks for tactical and mission-critical use cases. For example, a military unit in the field or emergency responders coordinating rescue efforts after a disaster could maintain voice and push-to-talk connectivity, even when no public cellular network is available. Or consider a tactical hospital deployment. If the internet connection fails, PMN from HPE can automatically scale down to a fully autonomous network, so that clinicians can still place local calls and reach on-site colleagues.

## Critical communications for command center and tactical units

Our PMN solution is designed using a federated model that enables military units to communicate securely and reliably with the command center and among themselves. By using role-based access control, organizations can control administrative access and grant access so that administrators can only access the network resources designated to them.

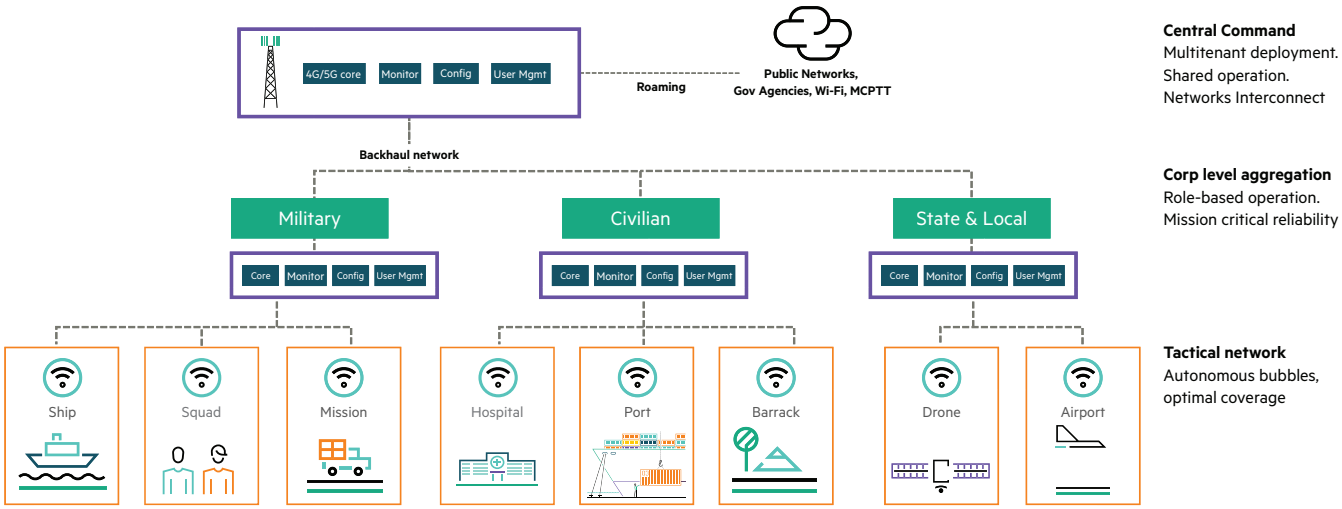



**Figure 5.** Multitenant hierarchical deployment

## Why HPE?

Federal, state, and local governments can take advantage of private cellular networks to augment their existing Wi-Fi in order to deliver wider area coverage, high-speed mobility, deterministic access, and traffic segmentation. Using private mobile networks, built on proven technology from Athonet, a Hewlett Packard acquisition, organizations can benefit from deployment simplicity, performance at scale, flexible radio options, and mission-critical voice services.

## Learn more at

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