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POWERING AUTONOMOUS MINING

Mavenir's Private Network Solution for Continuous Mining enables mining customers to increase productivity in mines and bring new levels of reliability, operational efficiency, safety, and automation.

Mavenir is partnering with mining customers to deliver a superior connectivity solution that provides **session continuity with zero downtime** for autonomous mining operations, distributed subscriber databases **to avoid re-provisioning**, and enhanced safety through **mission critical push-to-talk services**.

Zero downtime for autonomous mining operations with 4G and 5G wireless networks

Mavenir's Private Network Solution for Continuous Mining is inherently open, flexible, and future-proofed to take advantage of the rapidly developing 5G technologies.

It ensures a failover recovery time of fewer than five seconds, which is so instantaneous that no manual intervention is needed, and vehicles experience no downtime in case of a network issue (Figure 1).

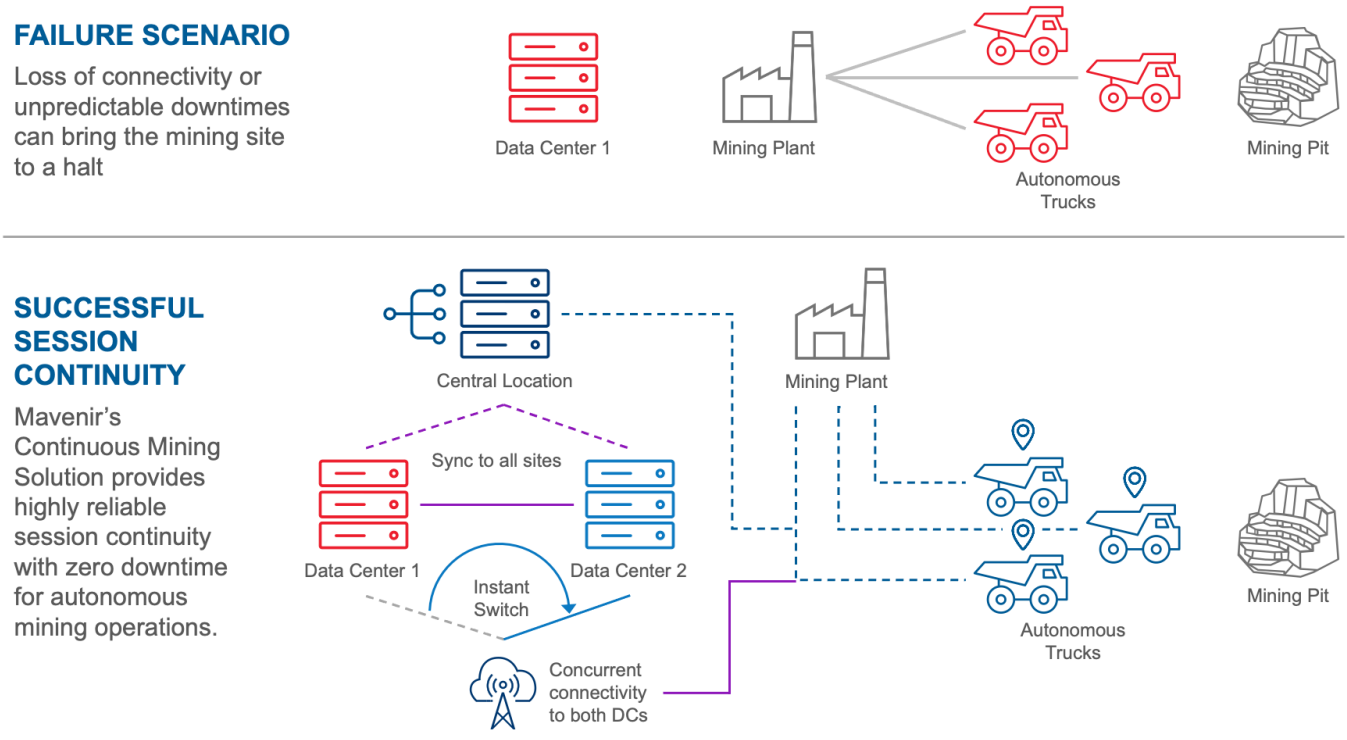

Figure 1: Session and production continuity

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Avoid re-provisioning with distributed subscriber database and policy functions

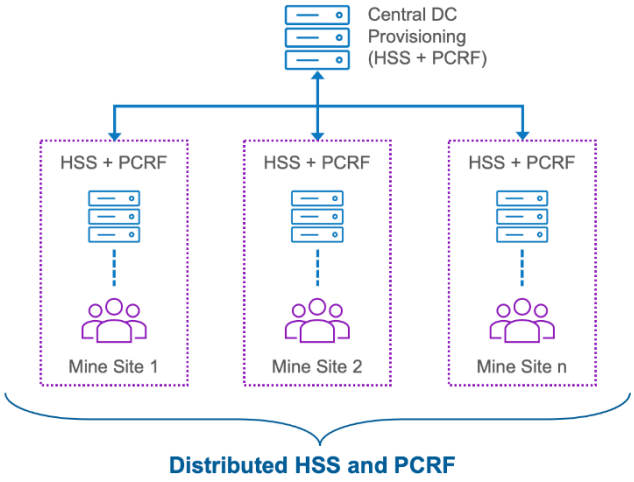

Figure 2: Distributed HSS and PCRF

A Home Subscriber Server (HSS) is the master database that contains user/miner profiles and performs authentication and authorization of the user (miner). It also provides the miner's physical location and list of subscribed services. To avail services at all mine sites, miners need to be registered at each site.

A **distributed HSS eliminates the need for mine workers to re-provision** their SIM cards when moving between mine sites. All sites are centrally provisioned and synchronized to provide seamless services to all registered miners. Network priority queues defined in the Policy and Charging Rules Function (PCRF) remain consistent at all mine sites (Figure 2).

Mission-critical communications services to ensure site safety

The **5G-Equipment Identity Register (EIR)** enables SIM card and device locked pairing that prevents misuse of SIM cards and helps mining operators protect their network from unauthorized devices. Local instances of EIR and HSS at each site ensure smooth operation in the event of a disconnection from a data center (Figure 3).

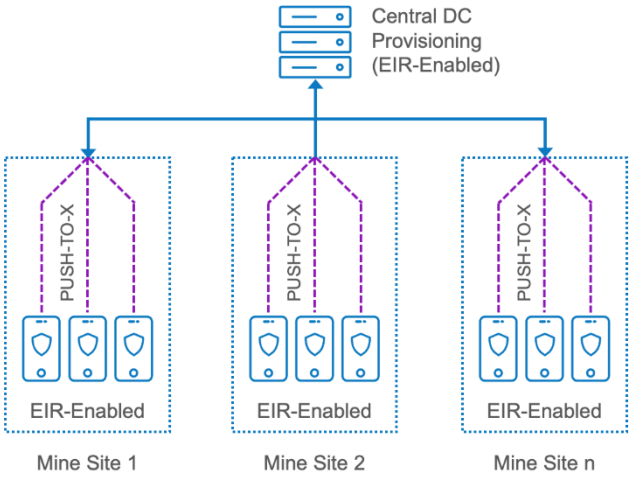

Figure 3: EIR-Enabled

Applications like **Mission Critical Push-To-Talk (MC-PTT)** can be securely used on Mavenir's distributed network. Mining communication systems are important to achieve effective communication and ensure safety. When miners are in the field, even seconds matter, and with Mavenir's Continuous Mining Solution, mining operators have access to powerful and reliable communications at critical times.

Figure 4: Benefits of Mavenir's Private Network Solution for Continuous Mining

Mavenir's Private Network Solution for Continuous Mining delivers varied capabilities needed for the mining industry (Figure 4).

- Autonomous vehicles transmit their location, direction, and speed several times each second, enabling acute situational awareness.
- Reliable session continuity depends on redundancy across data centers to safeguard the connected vehicles and the employees who work in the area. The Mavenir architecture and design, which ensures a failover recovery time of fewer than five seconds, is so instantaneous that no manual intervention is needed, and vehicles experience no downtime in case of a network issue

Mavenir's Private Network Solution for Continuous Mining includes:

> **Converged Packet Core** Mavenir's cloud-native Converged Packet Core accelerates the move to 5G with multi-generational support for 2G, 3G, 4G, and 5G, providing an evolutionary path with minimal risk. Build an open, automated network with greatly improved speed and reliability using a fully containerized core that can scale up or down and be deployed on any cloud.

> **Open vRAN** Mavenir's Open vRAN supports all generations (2G, 3G, 4G, 5G) and is built from the ground up to be cloud-native, with fully containerized microservices allowing it to be deployed easily on any cloud – private, hybrid or public. Performance tests have shown Open vRAN to match or exceed the performance of legacy/proprietary closed RAN.

> **Cloud-Native IMS** Mavenir's Cloud-Native IMS helps CSPs evolve their voice services in the 5G era and modernize operations with Kubernetes-based automation that is deployable as a VNF or CNF in either private or public clouds.

> **5G OpenBeam radio portfolio** Mavenir OpenBeam provided the largest portfolio of O-RAN-compliant radio products spanning RRUs through mmWave and mMIMO AAUs.

Mavenir's in-house designed OpenBeam portfolio is specifically designed for the growing needs of CSPs to be cost-efficient and intelligent to meet current and future network demands.

These features are designed on a fully software-based, open, 100% cloud-native, services-based architecture (SBA).

Powering autonomous mining through productivity, efficiency, and safety

The proven connectivity of Mavenir's Private Network Solution for Continuous Mining maximizes productivity, creates a safer environment, reduces costs, and improves sustainability. It provides a flexible 5G SA upgradable network, that guarantees session continuity, is secure, deploys distributed network components with central management and enables mission critical communication services.

About Mavenir

Mavenir is building the future of networks and pioneering advanced technology, focusing on the vision of a single, software-based automated network that runs on any cloud. As the industry's only end-to-end, cloud-native network software provider, Mavenir is transforming the way the world connects, accelerating software network transformation for 250+ Communications Service Providers in over 120 countries, which serve more than 50% of the world's subscribers.

For more on Mavenir solutions please visit our website at www.mavenir.com

