

RADIOHUB OVERVIEW

Project 25 Conventional Radio Systems today provide multiple levels of services. Fixed networks are built around permanent radio sites networked together with expensive backhaul networks. Coverage and capacity can be improved only through expensive upgrades to radio equipment, sites, and backhaul. Tactical, transportable communication is typically done by moving radio infrastructure into an area and using these temporary radios nodes to provide communication. A lack of network infrastructure with this approach limits the ability of users to communicate and hampers coordination and control of resources in the field.

The RadioHub Tactical Voting system provides the ability to bridge the benefits of fixed infrastructure while providing advanced mobility to radio communication networks. Using a combination of COTS equipment connected and managed to the RadioHub core, radio repeaters are networked together with command-and-control capabilities providing a comprehensive communication network that address tactical and mobile communication needs.

OPERATIONAL CONFIGURATIONS

With a focus on the P25 DFSI interface standard RadioHub interfaces with and operates with a multitude of COTS equipment. P25 voice and data routing allows for a complete functional system to be deployed and operated. Operational options allow users to deploy RadioHub in a multitude of configurations:

- **In-Field Operation:**

The RadioHub server can operate locally at an incident site with local base station radios providing localized control and configuration of the network. This allows system operation when backhaul is unavailable or unreliable.

- **Back Office Operation:**

For environments where backhaul to the radio sites is available, the RadioHub Server can be operated from a central operations center (EOC). Monitoring, Dispatch and Control can be accomplished from the EOC, the remote site or anywhere with network connectivity to the EOC.

- **Cloud Operation:**

For events or incidents that may expand globally or over wide areas or multi-agency deployments, a cloud centric approach may be best. RadioHub can be operated as a cloud control point allowing resources and communication globally or nationwide.



SYSTEM COMPONENTS

Radio Hub consists of three applications that allow management, control, and communication across the system. These components are:

RADIOHUB CONTROL SERVER:

The Control Server provides call routing, voting, and control for all connected calls. Using advanced internal algorithms, the RadioHub Control Server automatically monitors the latency, jitter and packet loss on each connected node and adjusts the real-time voting parameters to maximize voice and data quality. The Control Server Voter will select the voice and data packets from multiple receivers with the lowest bit error rate in real-time and provide a single output for dispatch and repeater retransmission.

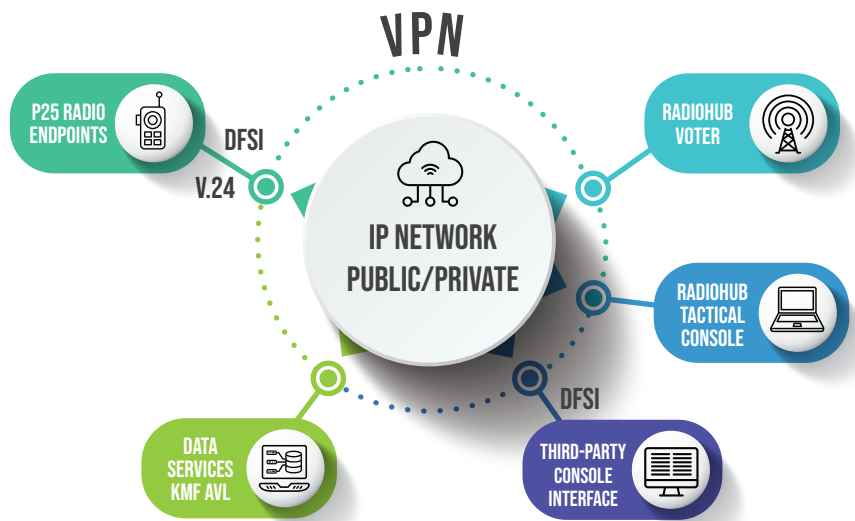
An internal data router delivers incoming data packets to an appropriate gateway based on the data type (SAP). Responses from the data gateway are automatically routed back to the appropriate base station allowing a single KMF or data server port to be used with multiple Voters and base stations. All P25 data types are supported, and OTAR operation has been successfully tested and validated on multiple KMF servers including the US Federal KMF.

RADIOHUB TACTICAL CONSOLE:

The RadioHub tactical console provides voice services to active voice channels. The console is self-configuring, it recognizes which channels are active and automatically builds a call path for each active channel. It also provides full recording of all calls traffic and automatic call replay of all calls.

SYSTEM CONFIGURATOR:

The system configurator provided the capability to manage radio and console inventory as well as managing the configuration of communication channels. It provides a simple intuitive point for entering the operational attributes of each connected radio, console, and data interface points. Once saved, configuration information is stored in the RadioHub system. If multiple servers make up the system, changes or new entries are pushed to each server, thus keeping all control points up to date with the latest configurations.



COMMAND & CONTROL

User have the option use both the RadioHub Tactical Console or they can also provide access though to third-party console using an available P25 DFSI compliant console interface.

SECURITY

RadioHub provides multi-layered security. The RadioHub network transports all P25 traffic with its end-to-end encryption intact. This ensures all voice and data communication within the network is never decrypted or modified by RadioHub network devices.

Management of subscriber encryption keys is accomplished through the RadioHub data port providing connection into third party KMF servers providing OTAR capabilities.

Additional security is provided though the RadioHub ability to support transport via VPN or SD-WAN security within the IP network. This provides an additional layer of encryption which is critical when utilizing networks outside of a user's control, such as LTE, satellite or the public internet.

Where available, RadioHub supports administration and control through integration with Microsoft Active Directory. The ability of Active Directory to control authentication and authorization of RadioHub administer ensures that only the proper personnel can access Tactical Dispatch or system administration and configuration tools.

NETWORK CONNECTIONS

RadioHub subscribes to the Bring Your Own Network concept of transport. Local Networks, Private Wire Area Networks, VPNs and SD-WANs are supported. The low bandwidth requirements of P25 DFSI traffic, combined with the RadioHub automatic management of latency and jitter support a wide variety of backhaul technologies, including:



FEATURES & CAPABILITIES

Server Configuration - Up to 3 system core servers of any type that provide coordination and gracefully recovery of system failures, plus multiple additional servers of any type

Network Types - Operates with any combination of IPV4 or IPV6 network transport technologies (DFSI links only support IPV4)

Network Security - Operates on Private networks or VPN/SD-WAN over public network

Fault Tolerance - Graceful recovery of failures with multiple servers operating in the system

Configuration Management - All changes to operational configurations are automatically synchronized to all servers on the network.

Supported channels - up to 20 independent channels/voters supported per server.

VOTER

Number of Radio Nodes per Channel - 25 Radios per channel

Latency and jitter - up to 1.2 seconds of latency and jitter per link

Ability to que / replay missed calls when simultaneous calls are received

CONSOLE

Third-Party Console Interfaces - 1 DFSI console interface per channel

Tactical Console - Up to 25 consoles positions per server

Automatic configuration download to track current server channel/radio configuration

Replay for missed transmissions

INTERFACES

P25 Voice and Data

Support for DFSI V1 /V2

V.24 with appropriate V.24 to DFSI Gateway

OPERATING SYSTEMS

Windows 10 /11, Windows Server 2019, 2022

Linux (server only)