MOTOBRIDGE™ IP INTEROPERABILITY SOLUTION

PROVEN MISSION CRITICAL PERFORMANCE YOU CAN COUNT ON

MOTOROLA MOTOBRIDGE™ SOLUTION
THE PROVEN AND AFFORDABLE WAY TO BRIDGE THE GAPS IN YOUR COMMUNICATIONS

- **Interoperability** - Interoperate across wide range of disparate networks and user devices. Extend radio network coverage through the IP network
- **IP Dispatch** - Over-IP dispatch and control. Simple graphical user interface. Advanced control features. Remote dispatch
- **Over-IP Radio Voting** - Efficiently communicate with required destination while saving system resources and cover "dead spots"
- **Designed to Survive** - Distributed architecture with no single point of failure
- **Superior Audio Quality** - Fast PTT and reliable audio over IP. Audio encryption. Advanced radio and voice signaling
- **Highly Scalable** - Easily expandable from a portable, on-scene solution to a city, county or statewide solution
- **Security** - Digital encryption and optional firewall

MOTOROLA MOTOBRIDGE™ MAIN MARKETS
CONNECTS YOU TO THE FUTURE

MOTOBRIDGE™ is an easy and fast way to establish communications between disparate systems in support of day-to-day utilities operations, fleet management and emergency services.

MOTOBRIDGE™ Utilities

- Public safety
- Electricity
- Oil & Gas
- Water
- National/Municipal disaster center
- Fire brigade
- Emergency Medical Services (EMS)
- Transportation (trains, buses, road assistance)
- More common utilities

The MOTOBRIDGE™ advanced IP interoperability enables the operator ability to extend its radio network coverage through the IP network, to perform smooth radio network transition (upgrade) and more.
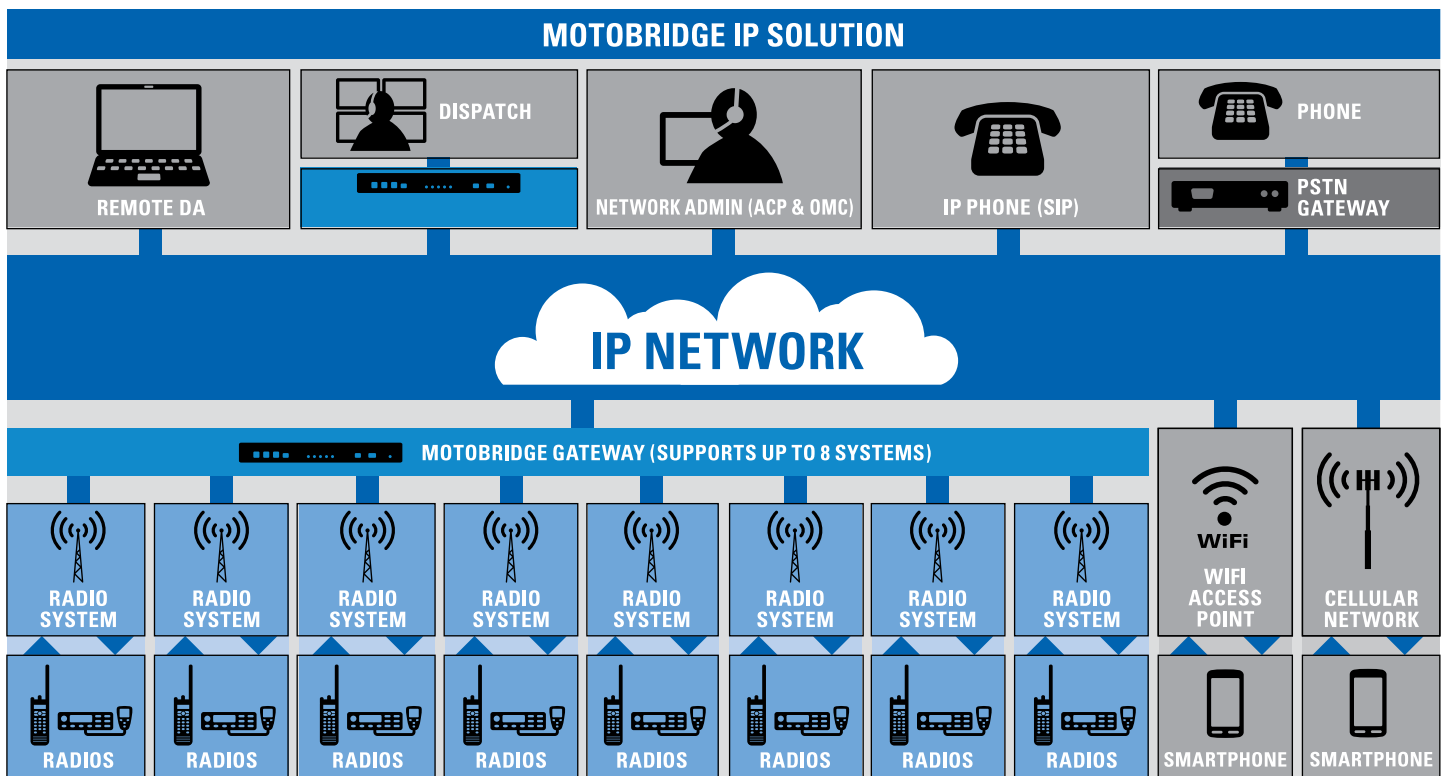
WIDE INTEROPERABILITY

Communication interoperability is a well-recognized imperative for public safety, utilities, homeland security, law enforcement, or any other organization that has a need to share intelligence, coordinate plans, and mount successful joint operations with others operating on disparate systems.

- Adaptable solution for interoperability across a wide range of networks and user devices
- Intelligent, robust gateways provide advanced radio and signaling capabilities to ensure mission critical performance
- Ability to transmit emergency alarm notifications between connected users (on networks that support this feature)
- Recognizes radio tones, such as accept and deny, from Motorola radios

In today's highly competitive world it is essentials to keep up the speed. There is no place or time for communication delays, interoperability issues, communication resources wastes or communication transition issues. The bottom line is what matters and the benefit is the only thing that counts.

The MOTOBRIDGE™ System

- Connect between different Radio types
- Connect between different services
- Bridge between communication systems on different dimensional spaces
- Overcome communication geographical boundaries
- Extend radio coverage through the IP network

- Smooth radio network transition
- Rich IP dispatch control features
- Incident control from site
- VoIP telephony and conferencing
- Over-IP radio voting

MOTOBRIDGE IP SOLUTION

REMOTE DA — DISPATCH — NETWORK ADMIN (ACP & OMC) — IP PHONE (SIP) — PHONE / PSTN GATEWAY

IP NETWORK

MOTOBRIDGE GATEWAY (SUPPORTS UP TO 8 SYSTEMS)

RADIO SYSTEM (×8) — WIFI ACCESS POINT — CELLULAR NETWORK

RADIOS (×8) — SMARTPHONE — SMARTPHONE

FLEXIBLE IP DISPATCH

MOTOBRIDGE™ provides state-of-the-art software tools for a range of uses and environments to enable the right people to communicate and make decisions, regardless of where they are at the time of an incident. Featuring an intuitive, easy to learn graphical user interface, the dispatch applications can be customized for use by personnel in a dispatch center, office setting or mobile command center.Users in the field have the flexibility to connect via PCs or Smartphones over IP, WiFi or 3G/4G.

Supported communication networks for interoperability

- Radio - P25, Analog, Conventional, Trunked, ASTRO, MOTOTRBO, TETRA, non-Motorola Radio (TX, RX & PTT)
- VoIP (Including SIP)
- Cellular
- Satellite phones
- Wire-line
- PSTN

MOTOROLA *SOLUTIONS*

4/8 PORT GATEWAY UNIT (RGU/WSGU)

The gateway unit is the primary hardware component required to create a MOTOBRIDGE™ interoperability network and can be configured to serve as either a Radio Gateway Unit (RGU) or a WorkStation Gateway Unit (WSGU).

RADIO GATEWAY UNIT

The RGU is used to connect up to 4/8 disparate radio systems into the MOTOBRIDGE™ solution. The RGU is small and robust which makes it possible to be mounted at a remote tower site, at the master site, or in a small radio closet at the command center.

RGU Main Tasks

- Connects radio equipment to the system
- Performs all audio buffering and signal processing
- Performs VoIP packet-distribution that allows all users to get a replica of the audio from each radio
- Supports up to 4 or up to 8 access radios
- Connected to peers over LAN or IP
- Encrypts audio over the IP network

WORKSTATION GATEWAY UNIT

Workstation Gateway Unit (WS-GU) Main Tasks

- Perform dispatching functionality and/or interfaces with the Dispatch Console PC
- Can be defined also as RGU (RGU/WSGU) in small systems
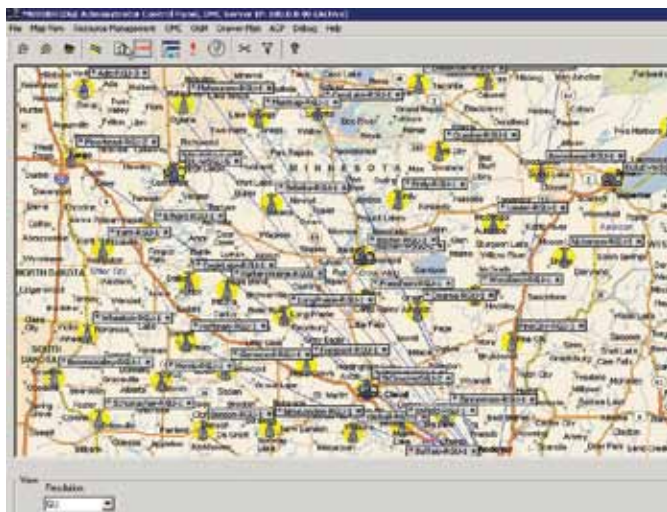
DISPATCH APPLICATIONS

State-of-the-art, intuitive, and easy to use GUI, which uses the latest Microsoft technology, providing the ultimate graphic quality and user experience. This application allows the dispatcher to view all radio resources available for interoperability and control the communication through the networks.

Local dispatcher on the Dispatch Console PC that is connected to the WSGU allows control over dispatch remote radios, intercom connections, audio conferences and phone calls.

The Dispatch Application (DA) is intended for mission critical user and it is most robust application, runs on Microsoft Windows operating system.

The Dispatch GUI Offers

- Intuitive drag-and-drop operation
- Enhanced for touch screen
- Customizable sizing and layout
- Multi language support
- IP camera support

ADMINISTRATOR CONTROL PANEL (ACP) CLIENT PC & OPERATIONS MANAGEMENT CENTER (OMC) SERVER

ACP provides a user level interface to the OMC and is used to view and monitor the status of the entire MOTOBRIDGE™ distributed network stored in OMC such as active patches, conferences and security parameters. ACP overrides any commands made at the dispatcher level for improved resource utilization. The ACP's reports and alarm statistics can be instantly recalled for post-mortem evaluations and protocol assessments. OMC provides control, administrative functions and network management tools.

SESSION INITIATION PROTOCOL (SIP) PROXY SERVER

SIP proxy server communicates with the gateway units in the system (RGU, WSGU) which implement the SIP User Agent (UA) portion of the standard which complies with the IETF-RFC3261 standard for multimedia call routing and telephony services on the Internet.

MOBILE WIRELESS DISPATCH APPLICATION (MWD)

- Provides dispatching capabilities from an Android OS based Smartphone
- Operating over Wi-Fi and 3G/4G network connections
- The MWD user can monitor, control and patch various radio types and communicate with other dispatchers by creating intercom connections
- Mainly used by senior commanders

MOTOBRIDGE™ leverages prior investments in systems, towers, dispatch centers, radios and other equipment. As field user keeps their familiar, radios training costs will be minimized

POWERFUL FLEXIBILITY

More than a simple audio patch, traditional IP gateway, or pure software solution, MOTOBRIDGE™ is a flexible solution with capabilities that allow it to fulfill a more advanced role in an organization's interoperability strategy.
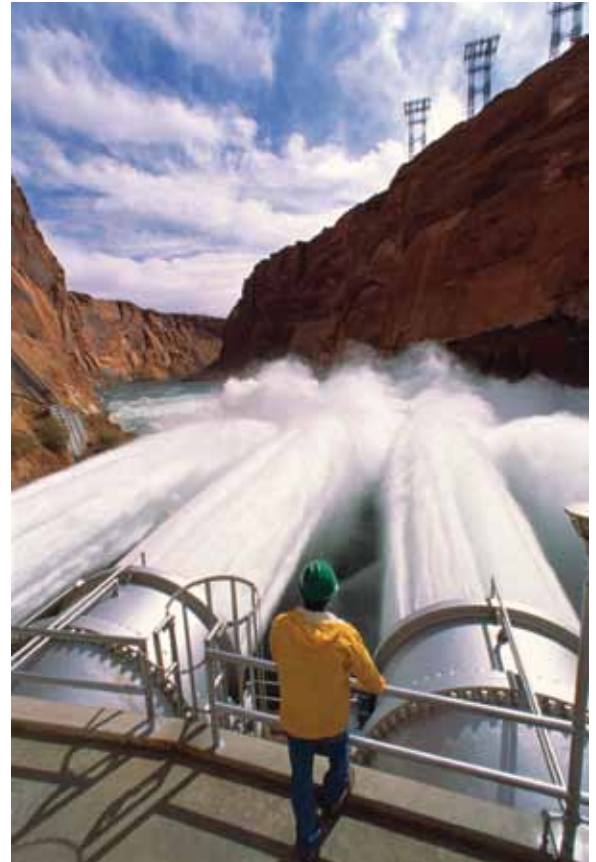
In addition to providing interoperability across disparate networks, MOTOBRIDGE™ provides

- IP dispatch functionality

- Full-duplex conferencing (depends on network capabilities)

- Direct phone (PSTN, Mobile, SIP) access to radio networks

- Proxy Multicast functionality

- Over-IP radio voting

- Network management

- Standards-based IP connectivity

DISASTER SURVIVAL ABILITY

MOTOBRIDGE™ features a robust, fully distributed architecture of VoIP gateways for peer-to-peer based interoperability services. It is expertly designed by Motorola to assure the highest possible level of survivability and reliability, with maximum fault tolerance and built in redundancy. The MOTOBRIDGE™ distributed architecture has no single point of failure. If a piece of equipment is damaged, or if the power goes out, redundant equipment takes over.

HIGH AVAILABILITY

The distributed MOTOBRIDGE™ gateways handle all the audio processing and advanced signaling with no central audio switch. Dispatch commands and voice are processed immediately, regardless of how busy the system becomes.

Established talk-paths are sustained by the MOTOBRIDGE™ gateways and are not impacted in the event of a PC or management server failure.

MOTOBRIDGE™ is optimized to operate on existing standard SIP-based customer networks without modifications, special multicast routers or proprietary network hardware.

SUPERIOR AUDIO QUALITY

MOTOBRIDGE™ gateways are designed with on-board security and sophisticated audio and signal processing in real time. Users experience fast PTT and reliable audio over IP, plus QoS support ensuring real-time audio gets highest priority over other types of traffic.

Dedicated processors manage different resources simultaneously

- Audio encryption processor handles more than 1000 AES-256 packets per second (encryption is an option)

- Voice communications are clear with minimum delay

- Three communication processors control and manage the three LAN segments present in each gateway

- Data processor handles all of the radio data in/out from up to eight radios connected per gateway, maximizing voice availability

INTEGRATION WITH MOTOROLA SYSTEMS

All Motorola radio features are available at the dispatcher station using the same user interface through the Dispatch Application GUI. "Virtual control heads" allow the dispatch work-station screen to emulate the familiar controls found on the user's Motorola mobile radio.

MOTOBRIDGE™ SYSTEM CAPABILITIES

GATEWAY UNIT CAPACITY AND PERFORMANCE FACTORS

SPECIFICATION	CAPACITY
Total radio ports per RGU	8 in 8-port GU, 4 in 4-port GU
Talkpaths per radio port	15 (Each radio connected to an RGU can be involved in 15 patches, including patches to other radios and to other Dispatch Console PCs)
Talkpaths per RGU	60 (due to a processing power limitation. Without this limitation the capacity would be 15 talkpaths per radio x 8 radios per RGU=120 talkpaths)
Talkpaths per Voter	15
Proxies connecting to IRC	10
IRC Proxies per WS-GU (that also serves as DA)	4
IRC Proxies per WS-GU (dedicated WS-GU)	10
Software Only DAs connecting to IRC Proxy	100
Conference bridge participants	8
Talkpaths per WSGU (Conference, intercom, radio, and phone talkpaths) assuming 1 DA is connected	24
WSGU soft phones	4
Number of connected RDA to single WSGU	7
BSI or Phone connections per RGU radio port (BSI and phone connections are utilizing RTP talkpath)	1
Speakers per WSGU on 8-port GU	9 (1mono in stereo jack + 8 mono)
Speakers per WSGU on 4-port GU	5 (1 mono + 4 mono)
Resources per speaker: Resources in "Select" or "Unselect" groups Other resources	16 8
Voters per RGU	4
Voting Nodes per Voter	64 (64 is the maximum when a single Voter is configured)
Audio encryption key length	256 bits maximum
Audio Replay duration per WSGU talkpath	60 seconds
Vocoders	G.711 and G.729 (RDA, Software Only DA, and Radio PTT are G.711 only)

OPERATING AND ENVIRONMENTAL SPECIFICATIONS FOR THE GATEWAY UNIT

SPECIFICATION	DETAILS
Dimensions	**Height:** 1.75 inches (1 rack unit) **Width:** 19 inch rack mountable, 17 inch desk mount **Depth:** 9.5 inches
Environment	**Operating temperature:** 0° C to 50° C (32° F to 122° F) **Storage temperature:** -20° C to 80° C (-29° F to 176° F) **Humidity:** 10% to 90%
Power	**RGU input power:** +22-26VDC (24VDC nominal), non-isolated. The F2840A input power is +20 to +60 VDC, and -20 to -60 VDC **Maximum Input Current:** 1.7 A **Dissipassion:** 20W
Audio	**Headset, MIC, and SPK:** MIC mono input impedance: 1.5KΩ @Vbias=10V; MIC stereo input impedance: 0.5KΩ@Vbias=10V; Output impedance to headset: 50Ω (unbalanced); Output impedance to headset: 100Ω (balanced); Output voltage to headset: 3Vpp; Output impedance to SPK: 1KΩ; Output voltage to SPK: 3Vpp **Radio:** Output impedance unbalance to radio: 240Ω (unbalanced); Output impedance to radio: 480Ω (balanced); Output power to radio: -25dBm to +10dBm @ 600Ω (The F2840A output audio is +10dBm); Input impedance from radio: 10,000Ω (unbalanced); Input impedance from radio: 20,000Ω (balanced); Input voltage from radio: 20mV to 3VRMS @ 10KΩ
Communications/Ports	1 PTT connection, 1 mono headset connection, 1 stereo headset/microphone connection, 1 10/100Base T LAN monitor port (for technician PC connection), 1 RS232 port, 2 10/100Base T LAN ports (1 for IP backbone, 1 for future use), 1 USB 2.0 host connection (for future use), 1 10/100Base T LAN port (for dispatch PC), 8 DB25 audio ports, 1 speaker output
Regulatory-EMC	FCC part 15 class A
Safety	EN60950-1
Green Product	RoHS
Encryption standards	AES, IPSec (Encryption is an option)
Vocoders	G.711 and G.729

For further information please contact your account/regional sales manager or BMS052@motorolasolutions.com

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