MOTOTRBO™

APPLICATION SERVICES & TOPOLOGIES OVERVIEW

VERSION 02.03

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1 Introduction

1.1 Purpose of this Document

This document is a high level overview of the MOTOTRBO application services. The document detail level is intended to provide a fundamental understanding of MOTOTRBO's application services capabilities, architecture, and topologies as well as to aid in the conceptualization of a feasible application solution.

1.2 Intended Audience

This technical communication product is for software and hardware engineering professionals with an interest in developing end-to-end solutions for the MOTOTRBO product portfolio. Readers of this document are expected to be knowledgeable about serial communications, IP networking, two-way radio equipment and systems as well as to be familiar with the different operational modes of MOTOTRBO.

1.3 Overview of MOTOTRBO

MOTOTRBO is an ETSI DMR Tier 2 compliant digital two-way Professional Radio with robust voice quality, scalable system topologies, and advanced data capabilities. The MOTOTRBO radio system uses a 2-slot TDMA air interface which allows for two simultaneous calls, whether voice or data, per physical channel.

Voice calls in the MOTOTRBO system are speech coded with the DVSI AMBE+2 vocoder for the injection and recovery of high quality voice as used in a low-bandwidth TDMA channel. MOTOTRBO is optimized for reliable data delivery and efficient channel utilization of low-to-medium sized "bursty" data transmissions.

MOTOTRBO is an IP-based communications system. Voice and data calls are routed through the system and a networked customer enterprise using an IP addressing schema. A unique IP address identifies each component of a MOTOTRBO system including subscribers, repeaters, data servers, and tethered by-wire or -wireless devices.

Fundamentally, MOTOTRBO supports an IP socket interface for data communications. Native data type support includes text messaging, location, and remote I/O. User-defined raw data may be sent through the MOTOTRBO system as well. Additionally, MOTOTRBO features a command & control interface that allows for customized operation of the MOTOTRBO subscribers to expand the customer experience and design of the product beyond the standard feature set.

1.4 MOTOTRBO System Topologies

MOTOTRBO supports six unique system topologies with different coverage and capacity profiles.

- **6.25e Direct Mode**

  6.25kHz equivalent Direct Mode operation provides subscriber-to-subscriber communication without use of infrastructure. Two TDMA timeslots are available for every 12.5kHz bandwidth channel.

- **Single Site Conventional**

  In the Single Site Conventional system topology, the MOTOTRBO system is comprised of a single repeater. A controller is not required to operate this system topology.

- **IP Site Connect**

  The IP Site Connect system topology provides coverage. This MOTOTRBO system topology is a multi-site network of repeaters connected via IP with each repeater constituting a site in the network. A controller is not required to operate this system topology.

- **Capacity Plus**

  The Capacity Plus system topology provides capacity. This MOTOTRBO system topology is a single site of multiple repeaters connected via IP. A controller is not required to operate this system topology.

- **Linked Capacity Plus**

  The Linked Capacity Plus system topology provides coverage and capacity. This MOTOTRBO system topology is a multi-site network of multiple repeaters at each site. A controller is not required to operate this system topology.

- **Connect Plus**

  The Connect Plus system topology provides coverage and capacity with managed channel efficiency. This MOTOTRBO system topology is a multi-site network of multiple repeaters at each site. A controller is required for every site in this system topology and is responsible for subscriber mobility management and call routing.

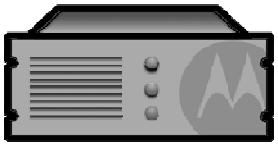
1.5 Abbreviations and Terms

Abbreviation	Terms
ACM	Abstract Control Model
APME	Asia Pacific & Middle East
ARS	Automatic Registration Service
AS	Analytics Service
BT	Bluetooth
CCS	Command & Control Service
CDC	Communications Device Class
CSBK	Control Signaling Block
DDMS	Device Discovery & Mobility Service
EA	Europe & Africa
ECMS	Extended Control & Management Service
GOB	Generic Option Board
JTS	Job Ticketing System
LACR	Latin America & Carribean Region
LE	Link Establishment
LRRP	Location Request & Response Protocol
MBXML	Motorola Binary XML
MCDD	Multi-Channel Device Driver
MNIS	MOTOTRBO Network Interface Service
MSI	Motorola Solutions, Inc.
NA	North America
NAI	Network Application Interface
PAN	Personal Area Network
PDS	Peer Discovery Service
RCEM	Remote Call Event Monitoring
RDAC	Repeater Diagnostics, Alarms, & Controls
RNDIS	Remote Network Driver Interface Specification
SPP	Serial Port Profile
SSI	Synchronous Serial Interface
TMS	Text Messaging Service
TIOP	Telemetry I/O Protocol
XCMP	Extended Control & Management Protocol

1.6 Symbols

MOTOTRBO Portable Subscriber

MOTOTRBO Mobile Subscriber



MOTOTRBO Repeater

2 Application Services

The MOTOTRBO system is extensible through defined application services for 3rd party developer use. The MOTOTRBO Application Services enable the creation of a custom solution to meet a customer need.

The MOTOTRBO Application Services are described by protocol specifications and development guidelines that are used as technical references by the 3rd party developer. The technical references of each interface detail the specific domain knowledge required to successfully implement a 3rd party application for the MOTOTRBO system.

2.1 Data Services

MOTOTRBO natively supports proprietary data application protocols for Device Discovery, Location, Text Messaging, and Telemetry I/O. Since MOTOTRBO is an IP-based product, it is also possible to send raw data through the MOTOTRBO network.

- **Device Discovery Service**

  Presence and capability information for subscriber radios in the network is available for the Wireless and Wireline Application Topologies. Through the Device Discovery Service, an application can use knowledge of radio presence and capability to optimize the delivery of data to and from the MOTOTRBO subscriber.

Device Discovery

- **Location Service**

  Location data for a GPS-enabled MOTOTRBO subscriber radio may be reported upon an immediate request, a pre-defined trigger, or an emergency call. Positioning information includes latitude, longitude, altitude, or speed. The Location Service is provided through **LRRP**. **LRRP** uses XML to define fields and attributes in the location requests and reports. To optimize the size of the XML document for transport through the network, **LRRP** is further transcribed into **MBXML**, a format which tokenizes XML tags in order to reduce the overall size of the information payload.

GPS

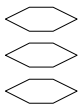
- **Text Messaging Service**

  Full display subscribers are text message capable for one-to-one or one-to-many short messaging. Select MOTOTRBO subscriber models further support **JTS** which is an enhanced messaging feature optimized for work order management solutions. **TMS** provides short messaging and job ticketing capability to an application.

Text Messaging

- **Telemetry I/O Service**

  Remote I/O control and monitoring of logic level-based external devices is available through **TIOP**. Select MOTOTRBO subscriber models support **TIOP** by providing application access to the radio's accessory connector I/O pins.



Telemetry I/O

- **Raw Data Service**

  Since MOTOTRBO is an IP-based communications system, generic UDP/IP communications for **Raw Data** is inherently supported. Small-to-medium sized "bursty" data is an ideal payload to transport over-the-air using MOTOTRBO.

1010
1101
Raw Data

2.2 Audio Operation

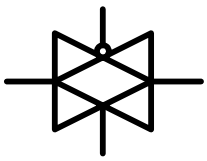
Audio Operation includes the communication, filtering, and enhancement of audio as it is transmitted and / or received within the MOTOTRBO radio system. Subscriber radios support the injection and recovery of audio in the analog domain via the radio accessory connectors as well as in the digital domain via an Option Board.

Audio Operation

Wireline (or control room) voice dispatch consoles are available as sold solutions from Motorola Solutions, Inc. Please contact the MSI regional channel or product team for more information.

2.3 Extended Control & Management Service for Subscriber

The Extended Control & Management Service is typically used to extend the capabilities of the MOTOTRBO subscriber radios' standard feature set. **XCMP** enables a 3rd party application to have direct interaction and control with the radio's features and ergonomics in order to supplement the user experience of the radio. **Audio Operation** applications are enabled by the use of separate connections for audio in conjunction with **XCMP**.



XCMP

2.4 Infrastructure Application Services

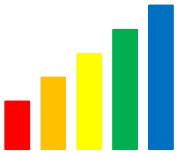
Infrastructure Application Services are only available through a UDP/IP connection to the MOTOTRBO infrastructure. These interfaces are sub-classified into **Gateway Application Services** and **Repeater Application Services** and are available for all modes of MOTOTRBO system operation. Gateway Application Interfaces require the 3rd party application to connect to the MOTOTRBO system via an IP gateway. For the Repeater Application Services, a direct connection to each repeater in the MOTOTRBO system is permitted for the 3rd party application.

- **Data Services**

  All Data Services, including Device Discovery, Location, Text Messaging, Telemetry I/O, & Raw Data, are available as Gateway Application Services.

- **RSSI Reporting Service**

  The RSSI Reporting Service measures the signal strength of inbound RF signals during the reception of data by the system from fielded subscriber units. The measured signal strength is encapsulated into a report with associated identifiers (such as system type, source IP, site ID, etc.) that is generated by the **MNIS**. This service is only available to a wireline application. The RSSI Reporting Service is a type of Analytics Service.



RSSI

- **Link Establishment**

  Before accessing any of the other Repeater Application Services, the 3rd party application must connect to each repeater of interest through **LE**. Once the link is successful, the specific service from the repeater must be requested within the **LE** protocol.

LE

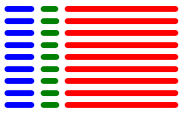
- **Control Signaling Service**

  The Control Signaling Service is used to process special signaling in the MOTOTRBO system such as Radio Check, Radio Inhibit, and Emergency. The Control Signaling Service is a type of Network Service

CSBK

- **Remote Call Event Monitoring Service**

  The **RCEM** interface allows a 3rd party application to log the events of all call types for voice and data. Call events include the start and end of voice calls for group, private, or emergency as well as the occurrence of data calls such as text messaging, as an example. Voice audio is not available through this interface. The **RCEM** Service is a type of Network Service.



RCEM

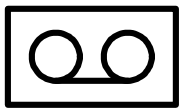
- **Extended Control & Management Service for Repeater**

  The Extended Control & Management Service for repeater focuses on **RDAC,** a subset of **XCMP**. This interface is specialized for the diagnosis and alarm reporting of repeater status as well as the control of repeater operation within the MOTOTRBO system. Voice audio is not available through this interface.

RDAC

- **Audio Recording Service**

  The Audio Recording Service enables a wireline application to record audio activity on any given channel in the system. This service only permits the recovery of audio from the system; injection of audio is not supported. The Audio Recording Service is a type of Console Service which is available through the Network Application Interface (**NAI**).



Audio Recording

  Wireline (or control room) voice dispatch consoles are available as sold solutions from Motorola Solutions, Inc. Please contact the MSI regional channel or product team for more information.

3 Application Topologies

The MOTOTRBO system is interoperable with multiple types of application topologies. An application topology is the composition of different components that are necessary to enable and form an application solution.

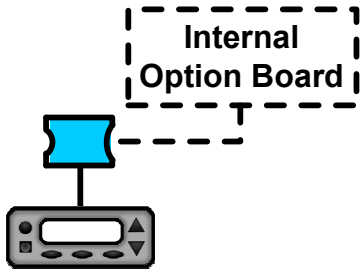
There are two general categorizations of an application topology – **Wireless Applications** and **Wireline Applications**.

3.1 Wireless Applications

A Wireless Application is recognized as a solution that uses a MOTOTRBO subscriber radio as a "donor" (i.e. control station) to access the MOTOTRBO system as well as extends the functionality of the MOTOTRBO subscriber radio beyond its standard feature set.

- **Option Board**

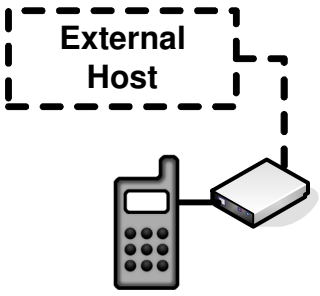
  An **Option Board** is an embedded host platform that integrates with the MOTOTRBO subscriber radio internally. Option boards permit the flexibility to not only extend the software features but also the hardware capabilities beyond what is standard in the radio. An Option Board application may support **Audio Operation**, the **Extended Control & Management Service**, and/or **Data Services**. The Option Board interface is available on MOTOTRBO portable and mobile radios.



  For the Option Board interface, three different implementation approaches are available to deploy an application. A third party developer may choose to (1) create a custom option board including all hardware and software, (2) source the **GOB** from Motorola Solutions and install the **GOB** with customized software into a MOTOTRBO radio, or (3) distribute customized software that can be flashed into select MOTOTRBO subscriber models that are factory-built with a **GOB** pre-installed. The **GOB** chipset includes an Atmel AVR32UC3B0512 microprocessor, a 64Mbit serial flash, and a 3-axis accelerometer.

- **External Host**

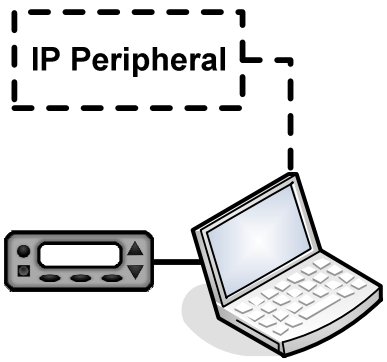
  An **External Host** is typically an embedded host platform that integrates externally, only using USB as a data transport, to the MOTOTRBO subscriber radio's accessory connector. In this topology, the External Host is expected to operate as a USB Host while the radio operates as a USB Device. An IP stack is not used in this topology. The MOTOTRBO subscriber radios are USB 1.1 hardware



and software compliant. An External Host application may support the **Extended Control & Management Service** and/or **Data Services**. **Audio Operation** is also supported through separate signal connections for analog audio. The External Host interface is available on MOTOTRBO portable and mobile radios.

- **IP Peripheral**

  In this topology, a PC connects to the radio via IP over USB. For the USB link, the PC is expected to operate as a USB Host while the radio operates as a USB Device. However, for the IP link, the radio acts as a DHCP server and is responsible for leasing an IP address to the PC.

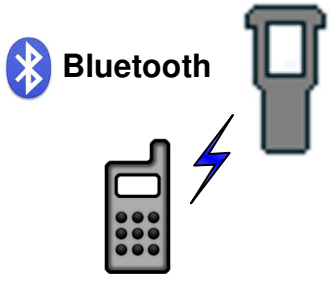


  The MOTOTRBO subscriber radio supports TCP and UDP sockets over the IP connection. The TCP/IP connection is used for the **Extended Control & Management Service** whereas the UDP/IP connection is used for **Data Services**. Separate connections for analog audio are used for the **Audio Service**.

  For Windows OS-based Wireless Applications, a **MOTOTRBO USB Driver** for establishing an IP socket connection to MOTOTRBO is available for reference, re-use, and re-distribution. Specifically for conventional systems with multiple channels, including single site repeater systems and IP Site Connect systems, a **MCDD** is available to the **Data Services** application for managing subscriber mobility within the network.

- **Bluetooth Device**

  The MOTOTRBO subscriber radios are Bluetooth 2.1 hardware and software compliant. The supported Bluetooth profiles for 3rd party application use are SPP and PAN. Specifically for PAN, the MOTOTRBO subscriber radios operate as a PAN Access Point while the expected operation of the 3rd party application is as a PAN User Client. A Bluetooth application may support the **Extended Control & Management Service** and/or **Data Services**.



  Select MOTOTRBO subscriber models support the Bluetooth interface natively.

3.2 Wireline Applications

The key attribute of a Wireline Application is the direct connectivity to the MOTOTRBO system's infrastructure via an IP connection. A Wireline Application supports **Data Services**, **Extended Control & Management Service**, **Peer Discovery Service**, **Network Services,** and **Console Service**.

In controller-less MOTOTRBO systems, subscriber radio presence, capability, and mobility is provided by the **DDMS**. The **MNIS** acts as a gateway and enables access to the **Data Services** in the MOTOTRBO network. Access to the **Extended Control & Management Service** as well as **Network Services** is through a 1-to-1 connection between the application and each repeater in the system.

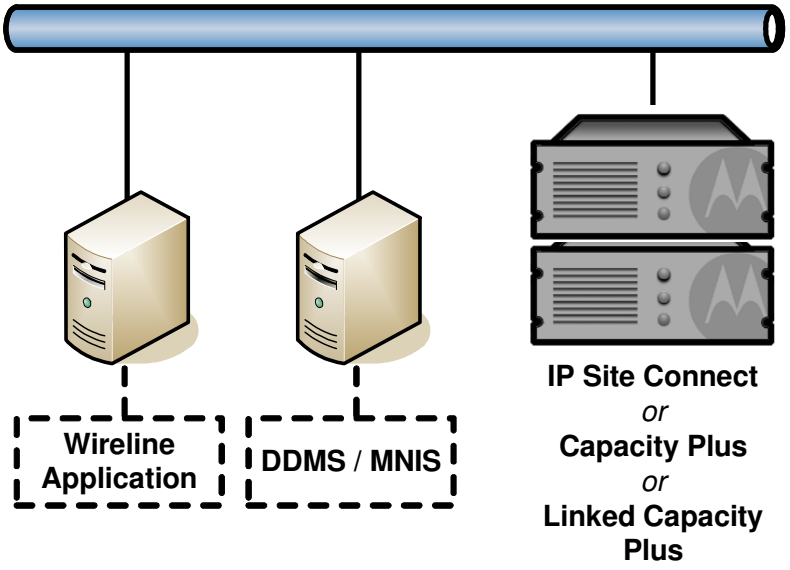


Figure 3-1 Wireline Application Topology for Controller-less Systems

In controller-based MOTOTRBO systems, subscriber radio presence, capability, and mobility are provided by the **XRC Controller** while select **Data Services** are supported by the **XRC Controller** and also the **XRT Gateway**. The **XRT Gateway** also provides **Network Services** to the **Wireline Application**. Access to the **Extended Control & Management Service** is through a 1-to-1 connection between the application and each repeater in the system.

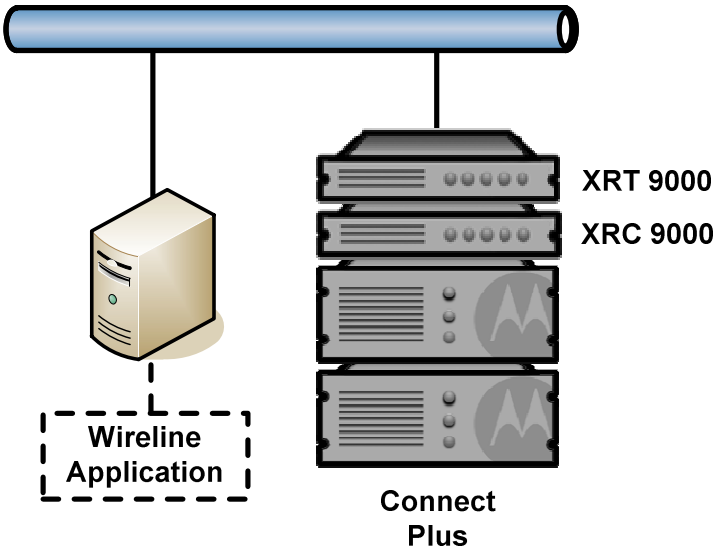


Figure 3-2 Wireline Application Topology for Controller-based Systems

4 Solution Topologies

Solutions created by 3rd party developers generally fall into three broad categories – **Data Server Solutions**, **Radio Control Solutions**, or **Network Management Solutions**.

4.1 Data Server Solutions

MOTOTRBO is an IP-based communication system and is usable as an IP network to transport data between a client and server. The data server may physically connect into the MOTOTRBO network through one of two ways – either by an IP connection to a MOTOTRBO subscriber radio, acting as a transparent donor into the RF network, or by an IP connection to the **MNIS** for controller-less systems, such as IP Site Connect, Capacity Plus, Linked Capacity Plus, or the MOTOTRBO **XRC Controller** or **XRT Gateway** for controller-based systems, specifically Connect Plus. The **MNIS**, **XRC Controller**, and **XRT Gateway** are IP gateways that perform low-level channel negotiation and call management for the delivery of data within the network.

Figure 4-1 depicts the typical topologies for a MOTOTRBO data server application in a controller-less system as well as the data interfaces available for 3rd party developer use. Figure 4-2 shows the typical topology for a MOTOTRBO data server application in a controller-based system along with the data interfaces for 3rd party application development.

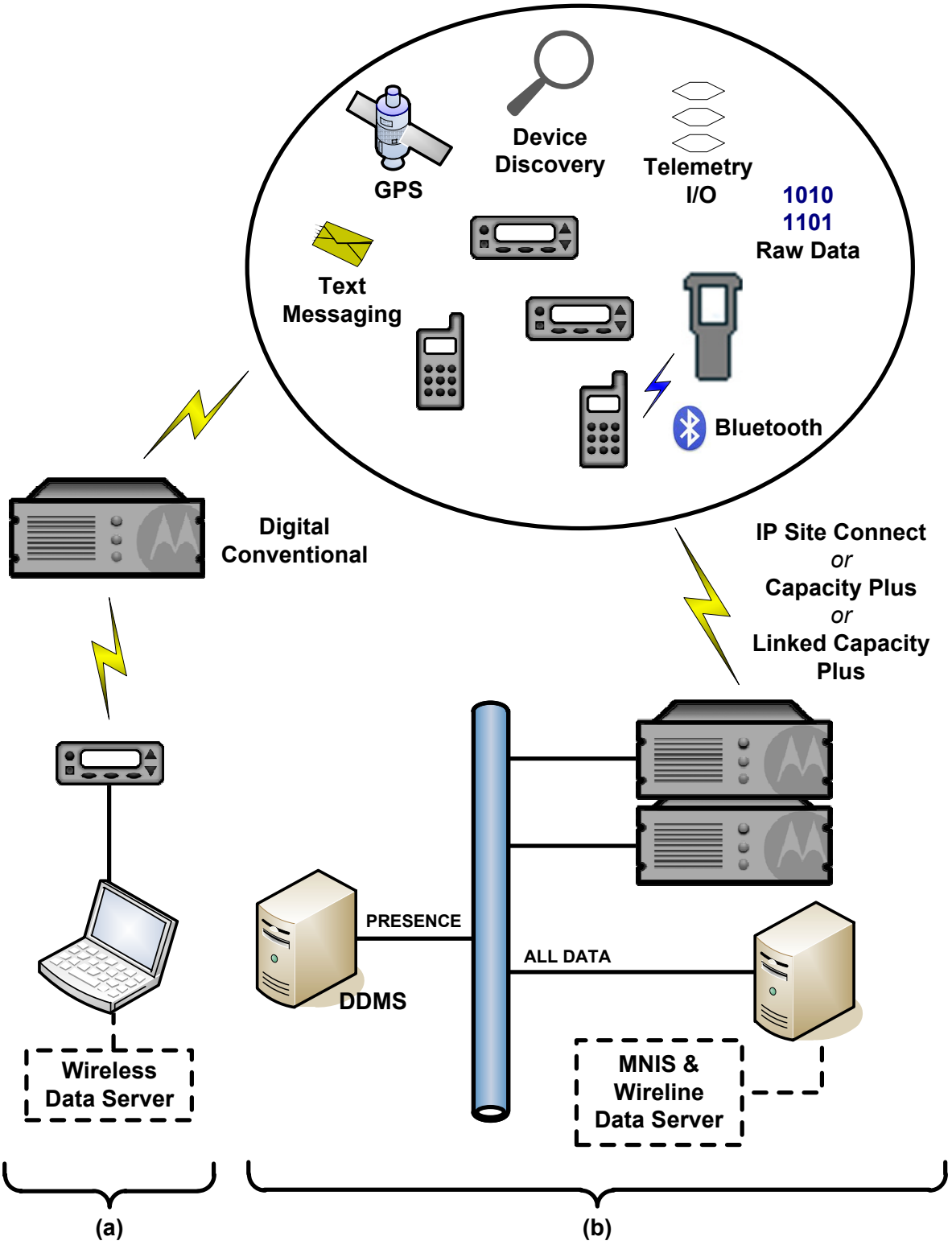


Figure 4-1 Typical Data Server Solution Topology Examples for Controller-less Systems – (a) Wireless Data Server and (b) Wireline Data Server

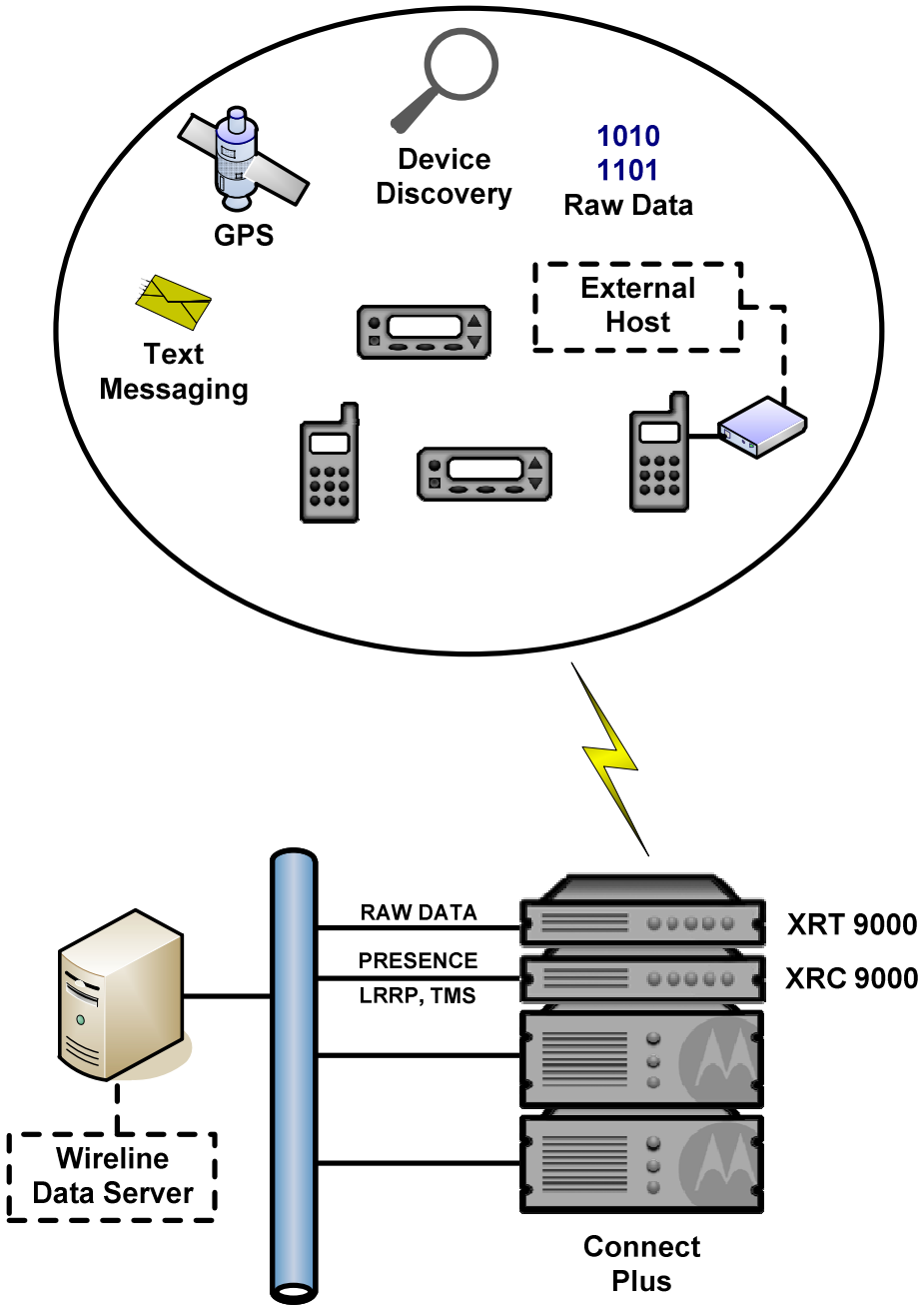


Figure 4-2 Typical Data Server Solution Topology Example for Controller-based Systems – Wireline Data Server

4.2 Radio Control Solutions

Radio Control Solutions extend the capabilities of the MOTOTRBO subscriber radios' standard feature set. All of the Wireless Application types – Option Boards, External Hosts, IP Peripherals, and Bluetooth Devices – are realizations of this solution topology. The Command & Control Service is used by wireless applications to directly interact with the subscriber radio. Connectivity to the radio may be over a serial link, IP socket, or Bluetooth.

The Command & Control Service focuses primarily on enabling applications to add new radio product experiences (e.g. signaling systems or user ergonomics) and secondarily on extending IP proxy-based data transport functionality to non-IP native applications.

Radio Control Solutions may operate in digital talkaround mode without MOTOTRBO infrastructure (i.e. 1-to-1 or 1-to-n subscriber-based communication) or within a MOTOTRBO system environment (controller-less or controller-based).

Figure 4-3 depicts a sample of the supported interoperability between MOTOTRBO product capabilities and Radio Control Solutions within a MOTOTRBO digital system-based environment as well as in MOTOTRBO Digital Talkaround.

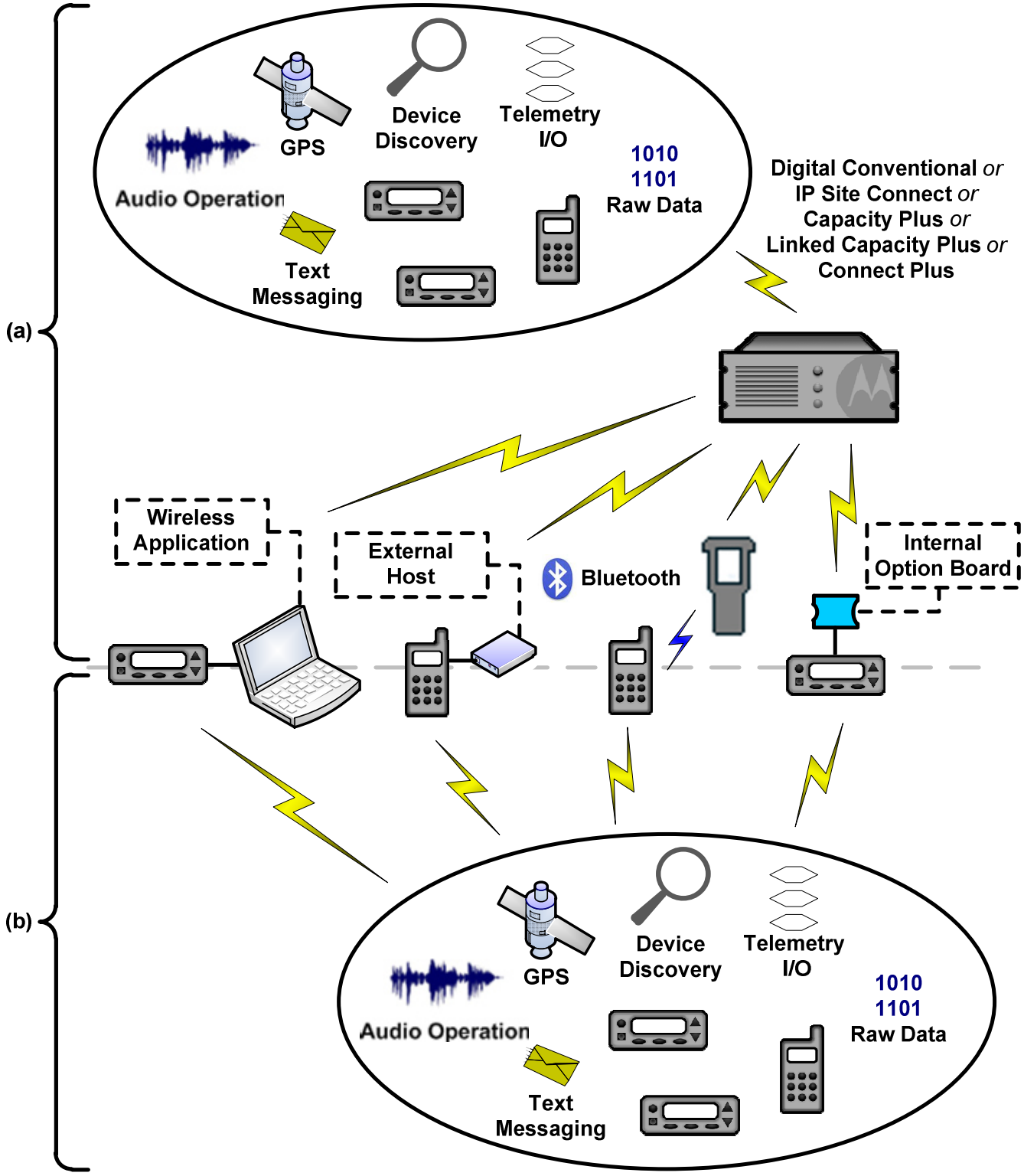


Figure 4-3 Interoperability Examples of Radio Control Solution Topologies – (a) MOTOTRBO Digital System-based and (b) MOTOTRBO Digital Talkaround

4.3 Network Management Solutions

Network Management Solutions are focused on the operation, monitoring, and health of the MOTOTRBO system. In controller-less systems, a network management application connects via IP to each repeater for access to **Network Services**, such as the Control Signaling Service, RCEM Service, and **Extended Command & Control Services**, i.e. the RDAC Service. For controller-based systems, a network management application accesses **Network Services** via an IP connection to the **XRT Gateway** while the **Extended Command & Control Service** remains accessible from each repeater.

A Network Management Solution is a Wireline Application in the MOTOTRBO system.

Figure 4-4 illustrates an example topology for a MOTOTRBO network manager in a controller-less system and the multiple connections required for the Extended Control & Management Service and Network Services.

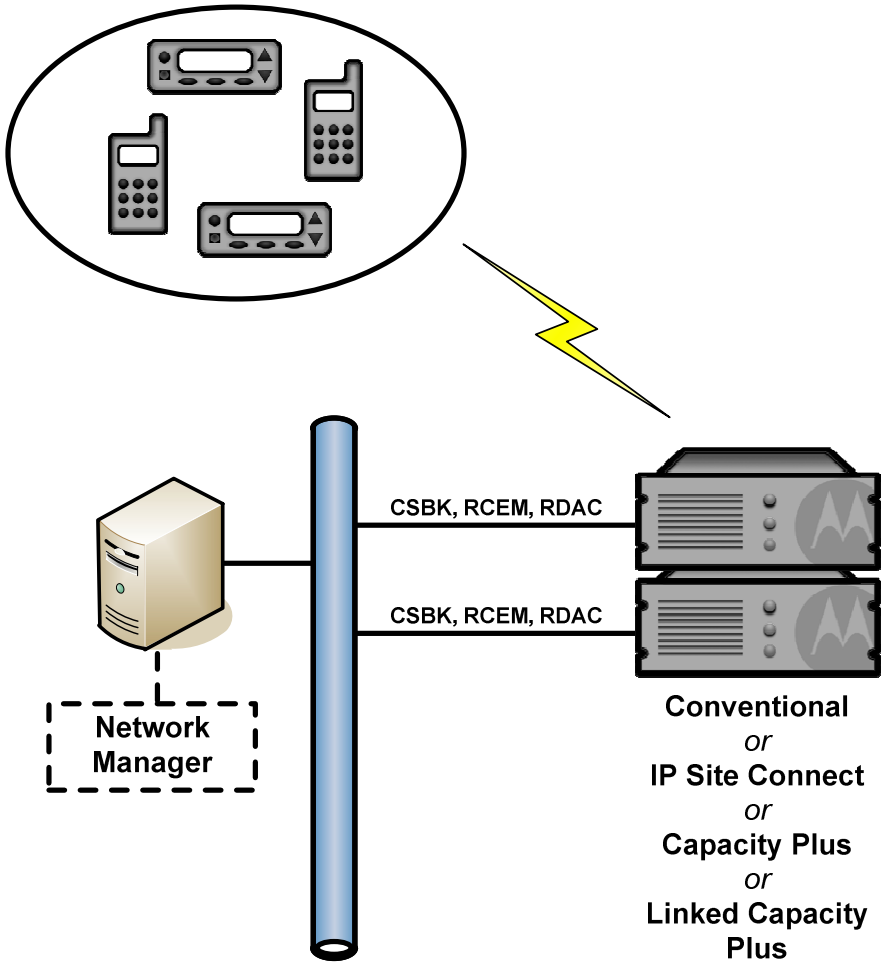


Figure 4-4 Typical Network Management Solution Topology Example for Controller-less Systems

Figure 4-5 depicts the typical topology for a MOTOTRBO network manager in a controller-based system as well as specifies the connectivity for the Extended Control & Management Service and Network Services.

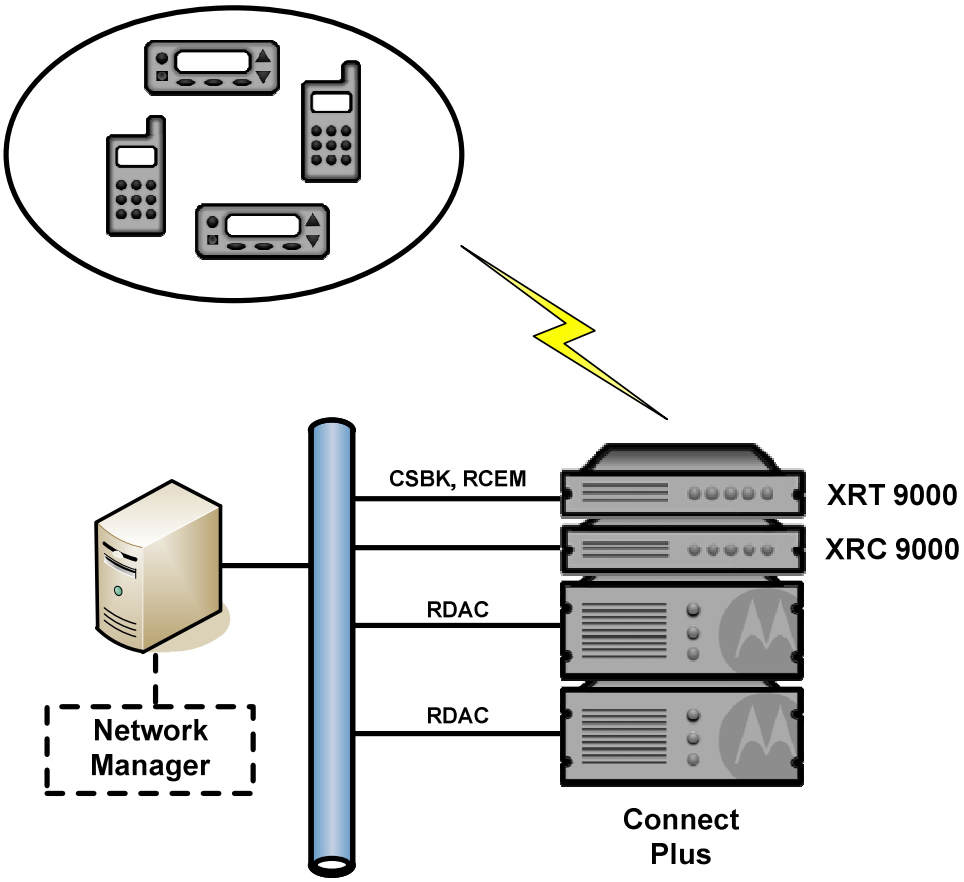


Figure 4-5 Typical Network Management Solution Topology Example for Controller-based Systems

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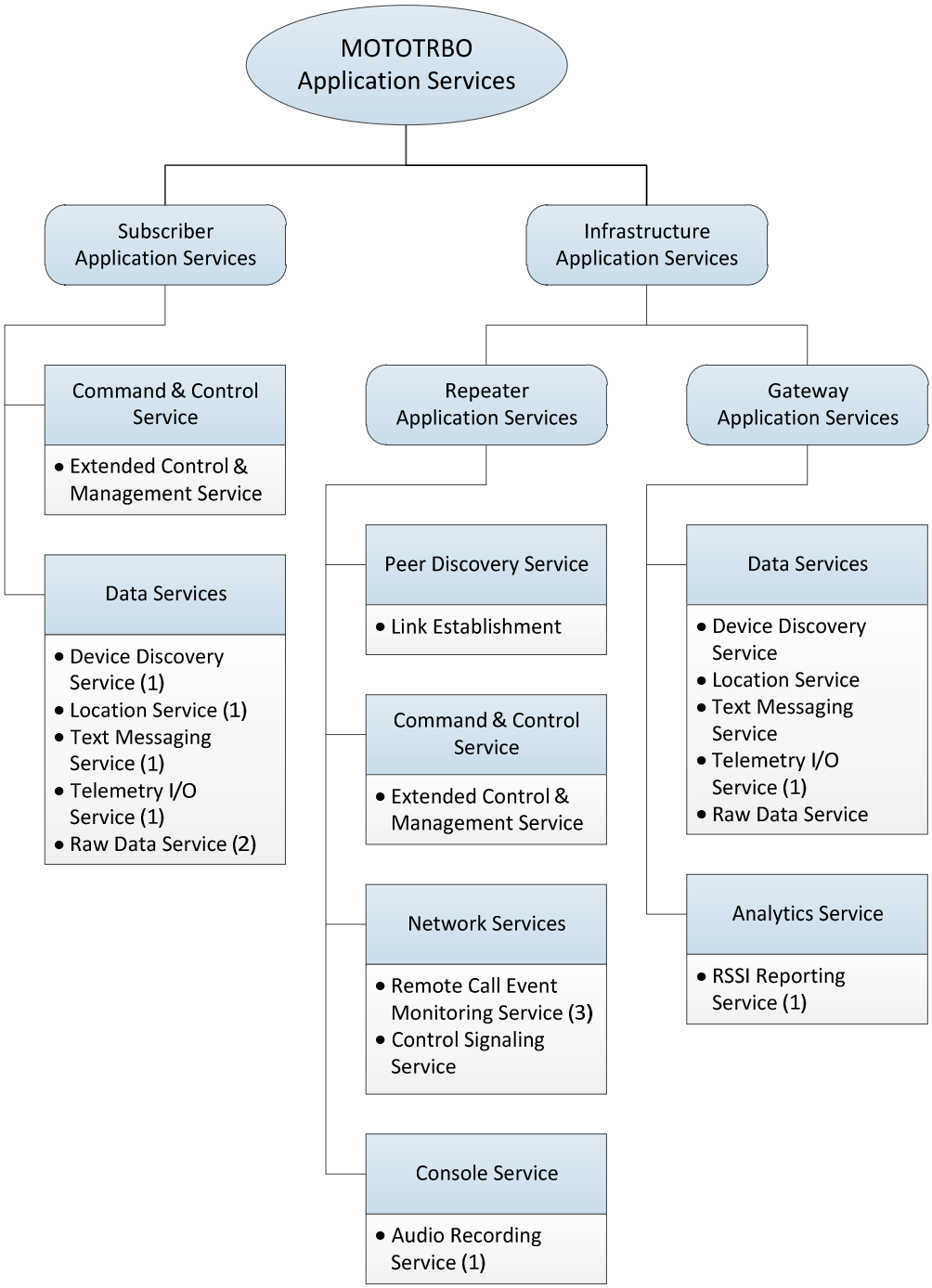
Appendix A MOTOTRBO Application Services

A.1 Application Services Taxonomy



1. Not supported in Connect Plus mode.
2. For Connect Plus mode, indirectly supported via Command & Control Service.
3. Supported as a Gateway Application Service in Connect Plus mode.

A.2 MOTOTRBO Subscriber Product Family by Region – Portables

	Commercial		Entry Professional	Professional	Professional - Specialized
					
APME	XiR P3688	SL1M	XiR P6600	XiR P8200	Not Available
EA	DP1000	SL1600	DP2000	DP3000	Not Available
LACR	DEP450	SL500	DEP500	DGP4000 & DGP6000	Not Available
NA	CP200d	SL300	XPR3000	XPR6000	XPR6580 IS [1]

	Professional Enhanced			Professional Enhanced - Specialized
				
APME	XiR P8600	SL1K	XiR E8600	Not Available
EA	DP4000	SL4000	DP3441	DP4000EX ATEX
LACR	DGP8000 & DGP5000	SL8550	DGP8050 Elite	DGP8550EX
NA	XPR7000	SL7500	Not Available	XPR7550 IS [1]

1. Available in Canada only.

A.3 MOTOTRBO Subscriber Product Family by Region – Mobiles

	Commercial	Entry Professional	Professional	Professional Enhanced
				
APME	XiR M3000	XiR M6660	XiR M8200	XiR M8600
EA	DM1000	DM2000	DM3000	DM4000
LACR	DEM400 & DEM300	DEM500	DGM6000 & DGM4000	DGM8000 & DGM5000
NA	CM	XPR2500	XPR4000	XPR5000

A.4 Application Services Accessibility

	Extended Control & Management Service	Data Services	Peer Discovery Service	Network Services	Audio Operation
Direct Access / Indirect Access / No Access					
Option Board / Generic Option Board	▲	■ [1]	●	●	▲
External Host	▲	■ [1]	●	●	▲
Bluetooth Device	▲	▲	●	●	■ [2]
IP Peripheral	▲	▲	●	●	▲
Wireline Application	▲	▲	▲	▲	■ [3]

1. Accessed by proxy via Extended Control & Management Service.
2. Supported by commercially available Bluetooth Devices with Headset Profile (HSP).
3. Audio Recording is accessible for qualified licensees. Voice Dispatch solutions are only available from MSI Sold & Supported suppliers.

A.5 Enhanced Data Delivery Support for Data Server Solutions

Full Support
Partial Support
No Support

	CONVENTIONAL SINGLE SITE	IP SITE CONNECT MULTI-SITE	CAPACITY PLUS MULTI-SITE	LINKED CAPACITY PLUS MULTI-SITE	CONNECT PLUS MULTI-SITE
Full Data Revert – Offload Traffic	Partial [1]	Partial [1]	Full	Full	Full [2, 3]
Scheduled GPS – Synchronize Reports	Partial [1, 4]	Partial [1, 4]	Full	Full	No
Single CSBK – Increase Throughput	Partial [5]	Partial [5, 6]	Partial [5]	Partial [5, 6]	No

1. Location Service only
2. Optimized by controller
3. Telemetry Service not supported
4. Device Discovery Service not supported
5. Device Discovery Service, Location Service, and Raw Data Service only
6. IP Peripheral-based Data Service solutions support Single CSBK Location Service from a single site only. MNIS-based Data Server solutions are fully supported at all sites

Appendix B Subscriber Application Development Specifications

B.1 Application Service Support for Portables – Controller-less Systems

	Commercial		Entry Professional	Professional	Professional - Specialized
▲ Full Support ■ Partial Support ● No Support					
Device Discovery Service	●	●	●	▲	▲
Location Service	●	●	●	▲	▲
Text Messaging Service	●	●	●	▲	▲
Telemetry I/O Service	●	●	●	▲	▲
Raw Data Service	■ [5]	●	●	▲	▲
Extended Control & Management Service	■ [4]	●	●	▲	▲

	Professional Enhanced			Professional Enhanced - Specialized
▲ Full Support ■ Partial Support ● No Support				
Device Discovery Service	▲	▲	▲	▲
Location Service	▲	■ [1]	▲	▲
Text Messaging Service	▲ [2]	▲ [2]	▲	▲ [2]
Telemetry I/O Service	▲	■ [3]	▲	▲
Raw Data Service	▲	▲	▲	▲
Extended Control & Management Service	▲	▲	▲	▲

1. Internal GPS not supported; use subscriber to send location triggers & receive location reports only
2. Supports Job Ticketing System (JTS)
3. Internal telemetry I/O not supported; use subscriber to control and query remote telemetry & receive telemetry notifications only
4. Available on select models; full support for Option Board topologies; partial support for IP Peripheral topologies
5. Available on select models; supported by proxy via Extended Control & Management Service

B.2 Application Service Support for Portables – Controller-based System

	Commercial		Entry Professional	Professional	Professional - Specialized
Full Support Partial Support No Support					
Device Discovery Service	● [1]	● [1]	● [1]	●	●
Location Service	● [1]	● [1]	● [1]	●	●
Text Messaging Service	● [1]	● [1]	● [1]	●	●
Telemetry I/O Service	● [1]	● [1]	● [1]	●	●
Raw Data Service	● [1]	● [1]	● [1]	■ [2]	■ [2]
Extended Control & Management Service	● [1]	● [1]	● [1]	▲	▲

	Professional Enhanced			Professional Enhanced - Specialized
Full Support Partial Support No Support				
Device Discovery Service	●	●	●	●
Location Service	●	●	●	●
Text Messaging Service	●	●	●	●
Telemetry I/O Service	●	●	●	●
Raw Data Service	■ [2]	■ [2]	■ [2]	■ [2]
Extended Control & Management Service	▲	▲	▲	▲

1. Radio models not supported on controller-based systems
2. Supported by proxy via Command & Control Service

B.3 Application Topology Support for Portables – All Systems

	Commercial		Entry Professional	Professional	Professional - Specialized
▲ Full Support ■ Partial Support ● No Support					
Option Board / Generic Option Board	●	●	●	■ [1] GOB 1.0	■ [1] GOB 1.0 CSA
External Host	●	●	●	▲	▲
IP Peripheral	●	●	●	▲	▲
Bluetooth Device	●	●	●	●	●

	Professional Enhanced			Professional Enhanced - Specialized
▲ Full Support ■ Partial Support ● No Support				
Option Board / Generic Option Board	■ [1] GOB 1.5	■ [1,2] GOB 1.5 SL	■ No GOB Support	■ [1,3] GOB 1.5 ATEX
External Host	▲	●	▲	▲
IP Peripheral	▲	▲	▲	▲
Bluetooth Device	▲ [4,5]	▲ [4,5]	▲ [4]	▲ [4,5]

1. Not supported on Connect Plus-enabled models
2. Integrated GOB only; no support for accelerometer at this time
3. Integrated GOB only
4. Bluetooth 2.1, HSP, SPP, and PAN profiles only
5. No support for Bluetooth SPP profile on Connect Plus-enabled models

B.4 Application Service Support for Mobiles – Controller-less Systems

	Commercial	Entry Professional	Professional	Professional Enhanced
Full Support Partial Support No Support				
Device Discovery Service	●	▲	▲	▲
Location Service	●	▲	▲	▲
Text Messaging Service	●	▲	▲	▲
Telemetry I/O Service	●	▲	▲	▲
Raw Data Service	●	▲	▲	▲
Extended Control & Management Service	●	▲	▲	▲

B.5 Application Service Support for Mobiles – Controller-based Systems

	Commercial	Entry Professional	Professional	Professional Enhanced
Full Support Partial Support No Support				
Device Discovery Service	● [1]	● [1]	●	●
Location Service	● [1]	● [1]	●	●
Text Messaging Service	● [1]	● [1]	●	●
Telemetry I/O Service	● [1]	● [1]	●	●
Raw Data Service	● [1]	● [1]	■ [2]	■ [2]
Command & Control Service	● [1]	● [1]	▲	▲

1. Radio models not supported on controller-based systems
2. Supported by proxy via Command & Control Service

B.6 Application Topology Support for Mobiles – All Systems

	Commercial	Entry Professional	Professional	Professional Enhanced
Full Support Partial Support No Support				
Option Board / Generic Option Board	●	■ [1] GOB 1.5	■ [1] GOB 1.0	■ [1] GOB 1.5
External Host	●	●	▲	▲
IP Peripheral	●	▲	▲	▲
Bluetooth Device	●	●	●	▲ [2,3]

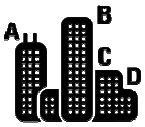
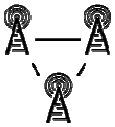
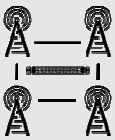
1. Not supported on Connect Plus-enabled models
2. Bluetooth 2.1, HSP, SPP, and PAN profiles only
3. No support for Bluetooth SPP profile on Connect Plus-enabled models

B.7 Application Service Connectivity by Topology

		Wireless Applications			
		Option Board / Generic Option Board	External Host	IP Peripheral	Bluetooth Device
Data Services	Device Discovery Service	Not Supported	Not Supported	UDP / IP via USB RNDIS	BT PAN
	Location Service	Via ECMS	Via ECMS	UDP / IP via USB RNDIS	BT PAN
	Text Messaging Service	Via ECMS	Via ECMS	UDP / IP via USB RNDIS	BT PAN
	Telemetry I/O Service	Via ECMS	Via ECMS	UDP / IP via USB RNDIS	BT PAN
	Raw Data Service	Via ECMS	Via ECMS	UDP / IP via USB RNDIS	BT SPP or BT PAN
Audio	Audio Operation	OB SSI	Analog Audio I/O	Analog Audio I/O	BT HSP
CCS	Extended Control & Management Service	OB SSI	USB CDC-ACM	TCP / IP via USB RNDIS	BT PAN

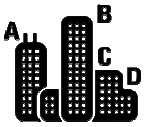
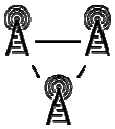
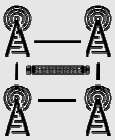
Appendix C Infrastructure Application Development Specifications

C.1 Application Service Support

	CONVENTIONAL SINGLE SITE	IP SITE CONNECT MULTI-SITE	CAPACITY PLUS MULTI-SITE	LINKED CAPACITY PLUS MULTI-SITE	CONNECT PLUS MULTI-SITE
▲ Full Support ■ Partial Support ● No Support					
Device Discovery Service	▲	▲	▲	▲	▲
Location Service	▲	▲	▲	▲	▲
Text Messaging Service	▲	▲	▲	▲	■ [1]
Telemetry I/O Service	▲	▲	▲	▲	●
Raw Data Service	▲	▲	▲	▲	▲
RSSI Reporting Service	▲	▲	▲	▲	●
Link Establishment	▲	▲	▲	▲	▲
Extended Control & Management Service	▲	▲	▲	▲	▲
Remote Call Event Monitoring Service	▲	▲	▲	▲	▲
Control Signaling Service	▲	▲	▲	▲	▲
Audio Recording Service	▲	▲	▲	▲	●
Voice Dispatch Service	MSI Sold & Supported	MSI Sold & Supported	MSI Sold & Supported	MSI Sold & Supported	MSI Sold & Supported

1. Job Ticketing System (JTS) not supported at this time

C.2 Application Topology Support

DDMS MNIS XRC Controller XRT Gateway Repeater	CONVENTIONAL SINGLE SITE 	IP SITE CONNECT MULTI-SITE 	CAPACITY PLUS MULTI-SITE 	LINKED CAPACITY PLUS MULTI-SITE 	CONNECT PLUS MULTI-SITE 
Device Discovery Service					
Location Service					
Text Messaging Service					
Telemetry I/O Service					Not Supported
Raw Data Service					
RSSI Reporting Service					Not Supported
Link Establishment					
Extended Control & Management Service					
Remote Call Event Monitoring Service					
Control Signaling Service					
Audio Recording Service					Not Supported
Voice Dispatch Service	MSI Sold & Supported	MSI Sold & Supported	MSI Sold & Supported	MSI Sold & Supported	MSI Sold & Supported

C.3 Application Service Connectivity by System

		Wireline Applications	
		Controller-less Systems	Controller-based System
Data Services	Device Discovery Service	TCP / IP	TCP / IP
	Location Service	UDP / IP	UDP / IP
	Text Messaging Service	UDP / IP	UDP / IP
	Telemetry I/O Service	UDP / IP	Not Supported
	Raw Data Service	UDP / IP	TCP / IP
AS	RSSI Reporting Service	UDP / IP	Not Supported
PDS	Link Establishment	UDP / IP	UDP / IP
CCS	Extended Control & Management Service	UDP / IP	UDP / IP
Network Services	Control Signaling Service	UDP / IP	UDP / IP
	Remote Call Event Monitoring Service	UDP / IP	UDP / IP
	Command & Control Service for Repeater	UDP / IP	UDP / IP
Console	Audio Recording Service	UDP / IP	Not Supported
	Voice Dispatch Service	MSI Sold & Supported	MSI Sold & Supported

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Appendix D Technical Documentation Catalog

New Major Revision	Last Obsolete Version
MOTOTRBO Application Services & Topologies Overview, Version 02.00 or later	ADK Overview, Version 01.05
MOTOTRBO Data Services Overview, Version TBD	Data Services Overview, Version TBD
MOTOTRBO Data Services Overview for Connect Plus, Version TBD	Data Services Overview for Connect Plus, Version TBD Third Party Raw Data Specification for Connect Plus, Version TBD
MOTOTRBO Development Specification – Automatic Registration Service, Version 02.00 or later	ARS Specification, Version 01.08
MOTOTRBO Application Manual – Device Discovery & Mobility Service, Version 01.02 or later	Device Discovery & Mobility Service-to-Watcher Interface Protocol Specification, Version 01.01
MOTOTRBO Development Specification – Presence Notification Service for Connect Plus, Version 02.00 or later	Presence Notifier-to-Watcher Specification for Connect Plus, Version 01.02 Presence Notifier-to-Watcher Specification, Version 02.00 Presence Notifier User Guide, Version 02.00
MOTOTRBO Application Manual – MOTOTRBO Network Interface Service, Version 01.02 or later	MOTOTRBO Network Interface Service ADK Guide, Version 01.01
MOTOTRBO Development Specification – Location Service, Version 02.00	Location Data Guide, Version TBD LRRP Specification, Version TBD Motorola Binary XML Encoding Specification, Version TBD
MOTOTRBO Development Specification – Location Service for Connect Plus, Version 02.00	Location Data Guide for Connect Plus, Version TBD LRRP Specification for Connect Plus, Version TBD Motorola Binary XML Encoding Specification, Version TBD
MOTOTRBO Development Specification – Text Messaging Service, Version 02.00	Text Messaging Guide, Version TBD Text Messaging Specification, Version TBD
MOTOTRBO Development Specification – Text Messaging Service for Connect Plus, Version 02.00	Text Messaging Guide for Connect Plus, Version TBD Text Messaging Specification for Connect Plus, Version TBD
MOTOTRBO Development Specification – Telemetry I/O Service, Version 02.00	Telemetry Guide, Version TBD Telemetry Specification, Version TBD 3rd Party Peripheral Cable Guide, Version TBD
MOTOTRBO Development Specification – Extended Control & Management Service for Subscriber, Version 03.00	XCMP/XNL Development Guide, Version TBD XCMP/XNL Development Specification, Version TBD Expanded Portfolio Language Character Range Specification, Version TBD
MOTOTRBO Development Specification – Extended Control & Management Service for Repeater, Version 02.00	Repeater XCMP/XNL Development Guide, Version TBD Repeater XCMP/XNL Development Specification, Version TBD
MOTOTRBO Development Specification – Link Establishment, Version 01.02 or later	Link Establishment Protocol Specification, Version 01.01

New Major Revision	Last Obsolete Version
MOTOTRBO Development Specification – Remote Call Event Monitoring Service, Version 02.00	Repeater Call Monitoring Protocol Specification, Version TBD MOTOTRBO Airtime Billing Specification for Connect Plus, Version TBD
MOTOTRBO Development Specification – Control Signaling Service, Version 01.01 or later	Network Application Interface – Control Signaling Services ADK, Version 01.00
MOTOTRBO Engineering Handbook – Generic Option Board, Version 02.00	Generic Option Board SDK Guide, Version TBD GOB 1.0 Schematic GOB 1.5 Schematic GOB 1.5 ATEX Schematic GOB 2.0 Schematic
MOTOTRBO Topology Guide – Option Board, Version 03.00	Option Board Development Guide, Version TBD Motorola Standard Tin, Bright Acid Bath Plating Motorola Standard Nickel Coating, Sulfamate Process
MOTOTRBO Topology Guide – External Host, Version 02.00	Non-IP Peripheral Guide, Version TBD 3rd Party Peripheral Cable Guide, Version TBD
MOTOTRBO Topology Guide – Bluetooth Device, Version 02.00	Bluetooth Development Guide, Version TBD
MOTOTRBO Topology Guide – IP Peripheral, Version 02.00	XCMP-Based IP Peripheral Guide, Version TBD 3rd Party Peripheral Cable Guide, Version TBD
MOTOTRBO Topology Guide – Wireline Application, Version TBD	TBD
MOTOTRBO Development Specification – Audio Recording Service, Version 01.01 or later	Network Application Interface – Audio Recording Service ADK, Version 01.00

Revision History

Version	Date	Page	Section	Notes
02.03	11/24/2014	A-2	A.2	Added SL Commercial Series Radio to subscriber chart
		A-4	A.5	Changed “Enhanced GPS” to “Scheduled GPS”
		B-1 – B-3	B.1 – B.3	Updated tables with SL Commercial Series Radio
		B-4	B.5	Corrected Application Service Support for Professional & Professional Enhanced Radio tiers
		D-1 – D-2	D	Updated last obsolete version number for Audio Recording Service ADK, Control Signaling Services ADK, Presence Notifier-to-Watcher Specification for Connect Plus, Device Discovery Mobility Service-to-Watcher Interface Protocol Specification, Link Establishment Protocol Specification
02.02	05/30/2014	2-3	2.1	Added description for RSSI Reporting Service
		2-4	2.1	Added description for Audio Recording Service
		3-2	3.2	Added support for Console Service
		A-1	A.1	Added Analytics Service / RSSI Reporting Service and Console Service / Audio Recording Service to MOTOTRBO Application Services diagram
		A-2 – A-3	A.2 – A.3	Added new MOTOTRBO Subscriber Product Family by Region tables
		A-3	A.4	Added service accessibility information for RSSI Reporting Service, Audio Recording Service
		B-1, B-2, B-4	B.1 – B.2, B.4 – B.5	Added new Application Service Support tables
		B-3, B-5	B.3, B.6	Added new Application Topology Support tables
		C-1	C.1	Added RSSI Reporting Service, Audio Recording Service, Voice Dispatch Service to Application Service Support table
		C-2	C.2	Added RSSI Reporting Service, Audio Recording Service, Voice Dispatch Service to Application Topology Support table
		D-1	D	Updated last obsolete version number for ARS Specification – replaced by MOTOTRBO Development Specification – Automatic Registration Service, Version 02.00
02.01	12/04/2013	C-1	C.1	Clarified Application Service support of Control Signaling Service for Connect Plus
		C-2	C.2	Clarified Application Topology support of Control Signaling Service for Connect Plus
		C-3	C.3	Clarified Application Service Connectivity support of Control Signaling Service for Connect Plus

Version	Date	Page	Section	Notes
02.00	12/03/2013	All	All	New overview of MOTOTRBO Application Services & Topologies; replaces MOTOTRBO ADK Overview

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