

MOTOTRBO™



Network Application Interface / Radio Management (including OTAP)



MOTOROLA SOLUTIONS LEARNING

SECTIONS



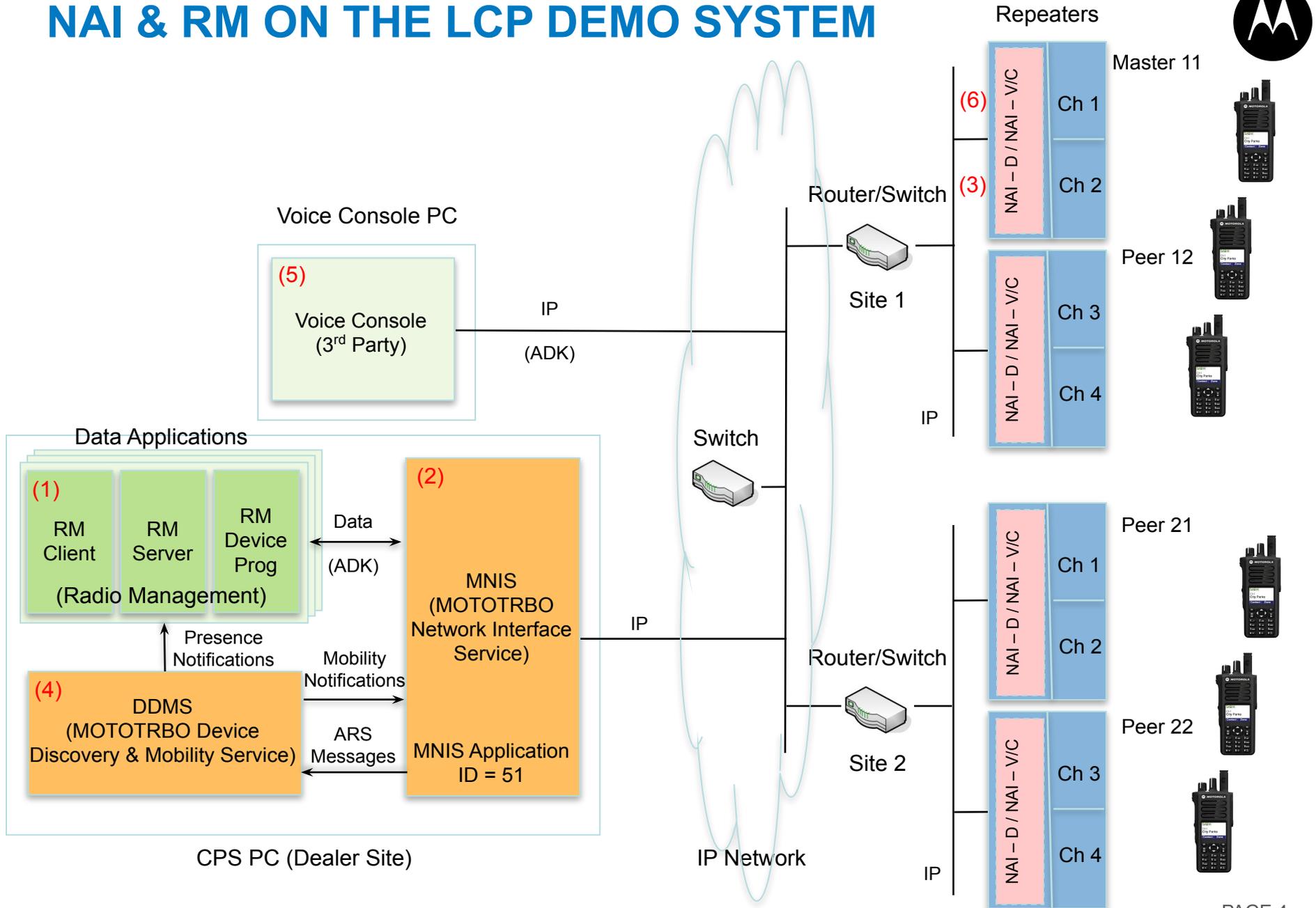
- 1. Introduction:**
 - High Level Overview / Demo**
 - Network Application Interface (NAI)**
 - Radio Management (RM)**

- 2. Technical:**
 - Network Application Interface (NAI)**
 - Radio Management (RM)**



INTRODUCTION

NAI & RM ON THE LCP DEMO SYSTEM





NETWORK APPLICATION INTERFACE (NAI)

FEATURE SUMMARY



Network Application Interface

- The Network Application Interface is an IP based interface on the repeater that enables Voice Consoles and Data Gateways to transmit and receive voice/CSBK and data calls directly through the repeater.

MOTOTRBO Network Interface Service (MNIS)

- The MNIS is Motorola Solutions supplied windows application, which acts as Data Gateway (middleware) between the data applications (including the DDMS) and the radio system.
- Data messages between the data applications (including the DDMS) and the radio system are routed through the MNIS.

MOTOTRBO Device Discovery and Mobility Service (DDMS)

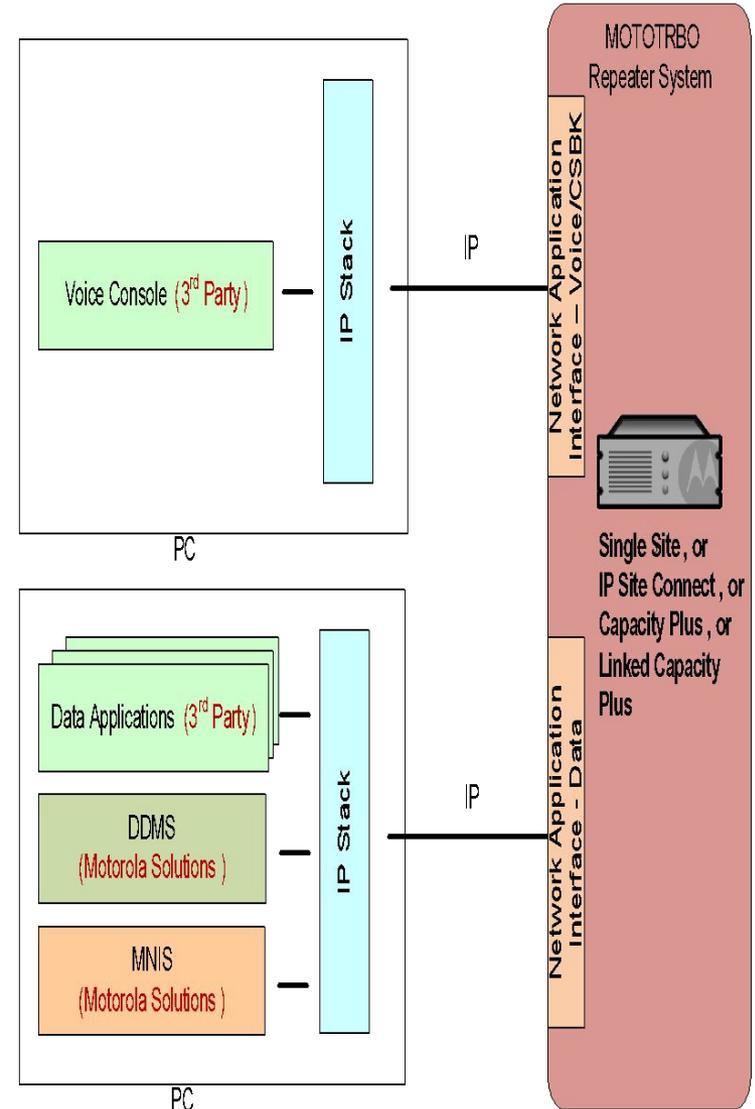
- The DDMS is Motorola Solutions supplied application, which replaces Presence Notifier (PN) application and provides radio presence and mobility tracking services.
- The DDMS interfaces to the radio system through the MNIS.

Data Applications

- Data applications such as Text, Location, Telemetry, etc..
- These apps are primarily supplied by 3rd party vendors, but can also be Motorola Solutions supplied apps such as RM (OTAP).
- Data applications interface to the radio system through the MNIS.

Voice Console

- Voice consoles are supplied by 3rd party vendors and interface directly to the radio system (Motorola Solutions does not provide middleware for voice).



The RDAC, Remote Repeater Programming CPS and Call Monitoring Apps do not utilize the Network Application Interface.

FEATURE SUMMARY



- Requires a software upgrade of repeaters:
 - Repeaters must have 32MB of flash memory
 - Compatible with current and next generation MOTOTRBO radios

- Requires feature activation in the repeater:
 - HKVN4211A DR 3000 NAI for Voice/CSBK License Key
 - HKVN4212A DR 3000 NAI for Data License Key
 - HKVN4214A MTR3000 NAI for Voice/CSBK License Key
 - HKVN4215A MTR3000 NAI for Data License Key

- ADK documentation for the following interfaces is maintained and made available via the Application Developers Program:
 - Network Application Interface for Voice/CSBK*
 - MNIS interface (to access the Network Application Interface for Data)

- The MNIS / DDMS software is released via the MOTOTRBO MOL website

(* to selected 3rd party application developers)

NETWORK APPLICATION INTERFACE – VOICE/CSBK



- 3rd party Wireline Voice Consoles utilizing the Network Application Interface can support following types of calls:
 - Group Call
 - Private Call or Confirmed Private Call
 - All Call
 - Voice Privacy (Basic and Enhanced)
 - CSBK calls – Radio Check , Call Alert, Remote Monitor, Radio Inhibit/Inhibit, Voice Console Enable/Disable
- The Interface allows 3rd party Wireline Voice Consoles to interrupt or impolitely takeover on-going Voice calls.
 - Where a Wireline Voice Console is required to interface to a given system site then all Voice Capable repeaters at that site must have their “Network Application Interface for Voice/CSBK” feature enabled using the CPS. Where a Wireline Voice Console is not required to interface to a given system site, then repeaters at that site do not need to have this feature enabled.

NOTES:

- Voice Capable repeaters are all repeaters except for data revert repeaters and repeaters where both slots are GPS revert slots.
- A Wireline Voice Console counts as 1 site, so the total number of IPSC/LCP sites plus Wireline Voice Consoles should not exceed 15.
- Support for Telephone calls (similar to Digital Telephone Patch) via this interface is a future roadmap feature.

NETWORK APPLICATION INTERFACE – VOICE/CSBK



- A Wireline Voice Console is required to interface directly to the radio system.
 - Motorola Solutions does not provide middleware for Wireline Voice Consoles.

- A Wireline Voice Console is also required to support AMBE vocoding.

- The above requirements add complexity to the Wireline Voice Console, so to ensure high quality fully supported implementations, Motorola provides support to selected 3rd party application developers as follows:
 - By making available the “Network Application Interface for Voice/CSBK”.
 - By providing the necessary technical training and support.

NETWORK APPLICATION INTERFACE – DATA



- The Network Application Interface for Data is an internal interface between the MNIS and the Repeaters.
- The MNIS provides 3rd party vendors with an ADK for accessing the Network Application Interface for Data (i.e. 3rd party applications do not access the interface directly).
- The interface between a data application and MNIS is very similar to the interface between a data application and control station for the case where the data application uses the MCDD and MOTOTRBO Presence Notifier.

MNIS OVERVIEW



- The MNIS is supported by Windows XP, Windows 7, Windows Server 2003 & 2008
- The MNIS supports the following MOTOTRBO data features:
 - Layer 2 confirmed and unconfirmed data message delivery
 - Individual and Group data messages
 - Basic and Enhanced Privacy
 - Data message IP/UDP header compression
 - Data Precedence and Data over Voice Interrupt access priority
- Compared to Control stations, the advantages of using MNIS for data are:
 - The deployment is simpler – no extra hardware
 - The data application does not need to be within the RF coverage area of the system
 - Data revert channels can be configured to be local – **Increases GPS capacity**
 - MNIS connectivity with the system can be monitored via RDAC
- Customers not wishing to use the Network Application Interface for Data feature shall still have the option of using Control Stations.

MNIS OVERVIEW



- The MNIS connects with the repeater system using the Link Establishment procedure of the repeater system.
 - This requires the MNIS to be configured with the Master repeater's IP address and UDP port number.
 - Upon connection with the Master repeater, the MNIS discovers the IP addresses and port numbers of all the repeaters in the system then establishes links with all the repeaters in the system.
- Upon connection with the repeaters, the MNIS uses the repeater's Network Application Interface and its underlying services to support data transmit and receive through the repeaters.
- The Link Establishment and Network Application Interface procedures are transparent to the data application.
 - Where a MNIS is required to interface to a given system site then all repeaters at that site must have their "Network Application Interface for Data" feature enabled using the CPS. Where MINS is not required to interface to a given system site, then repeaters at that site do not need to have this feature enabled.
 - The MNIS Configuration GUI allows configuration of system link establishment parameters such as Master IP Address, Port, Peer ID, etc.

MNIS APPLICATION ID



- The MNIS has an identifier, called the MNIS Application ID.
- The ID is configured in the MNIS using the MNIS configuration GUI.
- The ID is used by the MNIS to receive and transmit on the radio network.
- Whenever a radio needs to communicate with the data application (or vice versa) the MNIS Application ID is used.
 - For example, the ARS and TMS Radio ID fields in a radio need to be configured with the MNIS Application ID such that data messages from a radio to the ARS or TMS applications contain the MNIS Application ID as the destination address.
 - Likewise, data messages from the ARS or TMS applications to a radio need to have the MNIS Application ID as the source address.
 - The MNIS application ID is akin to the Radio ID of a control station.
- **Fielded radios should not be configured with a Radio ID that matches the MNIS Application ID.**

DDMS OVERVIEW



- The DDMS is supported by Windows XP, Windows 7, Windows Server 2003 & 2008.
- The DDMS replaces the legacy Presence Notifier (PN) application.
 - The DDMS is backward compatible with the Presence Notifier such that existing applications that interface with the Presence Notifier do not require any changes to receive presence notifications from the DDMS.
- The DDMS can be deployed with a Control Station or the MNIS.
 - When deployed with a Control Station, the DDMS supports only radio presence notifications.
 - When deployed with the MNIS, the DDMS supports both presence notifications and mobility notifications.
- A presence notification indicates a radio's presence or absence in the radio system.
- A mobility notification indicates the channel/site from which a radio transmits its ARS Device Registration message.
- When transmitting messages to a radio from a data application, the MNIS uses a radio's mobility information (supplied by the DDMS) to determine the channel/site to use.
- Besides the MNIS, other applications can also receive a radio's mobility information from the DDMS.

DDMS WATCHER INTERFACE



- The DDMS maintains both the radio presence and mobility information.
- The DMMS provides a Watcher interface to enable applications to obtain radios' presence and mobility information and notifications of changes in radios' presence and mobility information.
- Presence Information:
 - The MNIS forwards a radio's ARS message to the DDMS which updates the radios presence information.
 - The DDMS notifies data applications that have subscribed for presence through the Watcher interface.
- Mobility Information:
 - The MNIS forwards a radio's ARS message to the DDMS which updates the radios mobility information.
 - The DDMS notifies data applications (including the MNIS) that have subscribed for mobility through the Watcher interface.



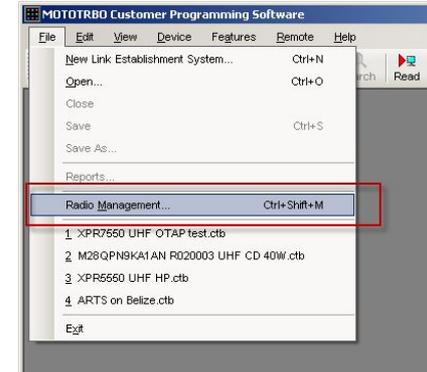
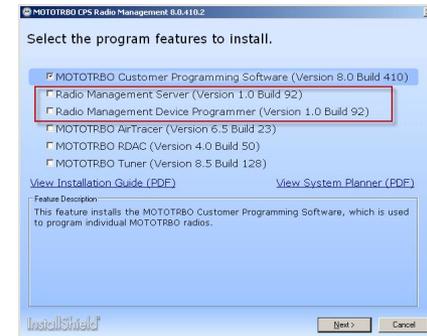
RADIO MANAGEMENT (RM)

All MOTOTRBO radios can be managed and programmed / read using a wired connection. Additionally, the 2000 series, DP3441, SL4000 and 4000 series radios can be programmed / read over the air (OTA).

RADIO MANAGEMENT OVERVIEW



- ❑ **Radio Management (RM)** is an extension of the MOTOTRBO CPS. RM maintains historical records of radio codeplug information for each device in a centralized server, with the ability to search, sort and group radios and apply programming templates to multiple units for unmanned programming. RM is also a data application that programs / reads radios OTA and via a wired connection.
- ❑ **RM Client** is a window into RM and is accessed through the CPS > File menu.
- ❑ **RM Server** stores codeplugs and templates and pre-processes jobs.
- ❑ **RM Device Programmer** acts as the programming interface to the radios.
- ❑ **MOTOTRBO Network Interface Service (MNIS)** is the NAI Data Gateway (middleware) between the data applications and the radio system.
- ❑ **MOTOTRBO Device Discovery & Mobility Service (DDMS)** replaces the Presence Notifier (PN) and provides radio presence and mobility tracking services.
- ❑ **Multi Channel Device Driver (MCDD)** tracks the location of radios as they move from channel to channel and updates the IP routing accordingly.



Note: All the above are included on the CPS DVD GMVN5141_ and are also available to download “Free of Charge” from Motorola Online.

RADIO MANAGEMENT (RM) SOFTWARE LICENSES



- ❑ The Radio Management (RM) Server can store and manage up to 5,000 radio codeplug archives
- ❑ Initial installation contains licenses for 10 radio archives by default
- ❑ To add additional radio archives to RM for Wired or OTAP management and programming – additional licenses have to be purchased
- ❑ HKVN4065A - block of licenses to add an additional 500 radio archives

IMPORTING RM LICENSES



Actions > Manage Licenses

File Edit View Device Features Window Help

Open Save Reports Delete Cut Copy Paste Search Read Write Clone Bluetooth 192.168.11.1

Radio Management License Summary

Feature Name	Capacity	Used	Unused
Radio Management	10	2	8

Add License from EID (Internet Connection Required)

Enter Entitlement ID

Entitlement ID	Feature Name	Purchased	Available	Enter Quantity
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View Expert View NUM

Total Available Entries

Total Entries Unused

Total Entries Used

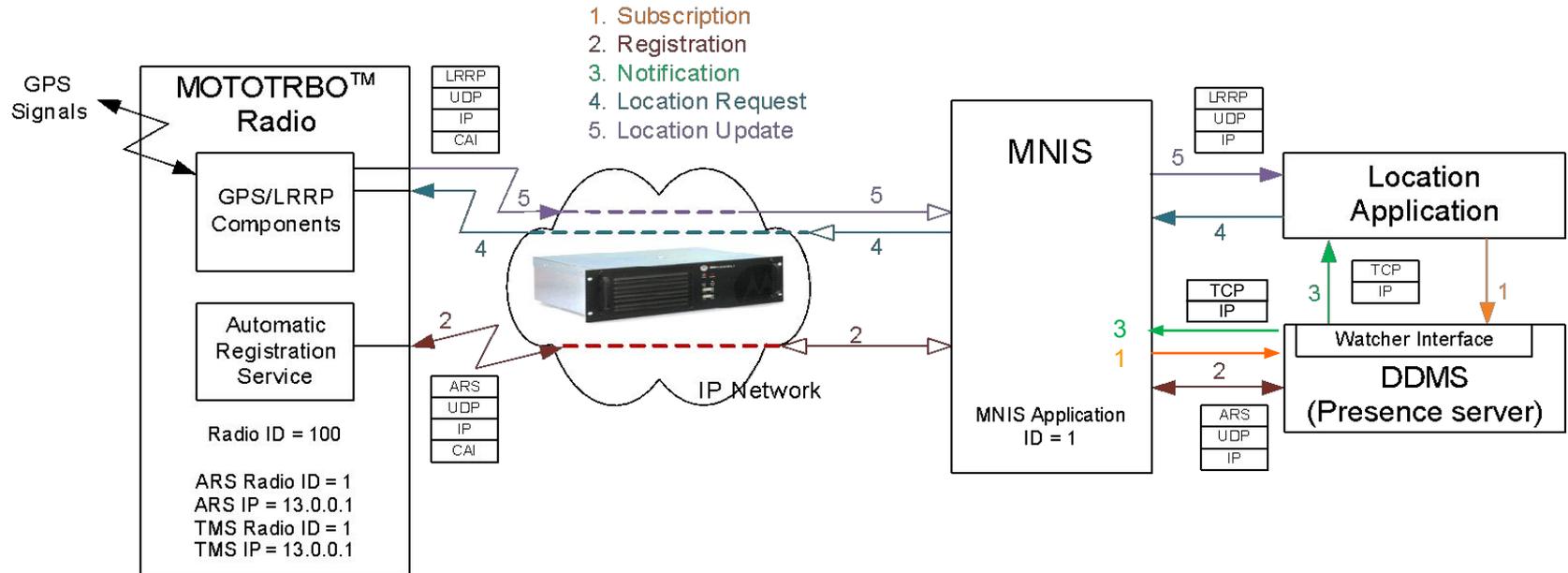


TECHNICAL



NETWORK APPLICATION INTERFACE (NAI)

DATA FLOW



1. The Location Application subscribes for radio presence information with the DDMS and the MNIS subscribes for radio mobility information with the DDMS.
2. Upon power up the radio transmits an ARS message to register with the DDMS. The ARS message is received by the repeater and sent to the MNIS. The MNIS then routes the data message to the DDMS.
3. The DDMS notifies the Location Application of the radio's presence and the MNIS of the radio's mobility.
4. The Location Application sends a Location Request which gets routed to the MNIS. The MNIS uses the radio's mobility information to determine where the Location Request needs to be transmitted and routes it to the appropriate repeater. The repeater then transmits the location request to the radio.
5. The radio transmits its Location updates which are received by the repeater and sent to the MNIS. The MNIS routes the location updates to the Location application.

SYSTEM CONFIGURATIONS



- The MNIS supports the following MOTOTRBO Digital system topologies: Single Site Conventional, IP Site Connect, Capacity Plus and Linked Capacity Plus.
- The MNIS supports the following MOTOTRBO Digital channel types: Single Site Conventional, IP Site Connect (Local and Wide Area), GPS Revert (Standard and Enhanced), Capacity Plus / Linked Capacity Plus (Trunked and Data Revert).
- The MNIS does not support the MOTOTRBO Digital Mixed Mode system configuration.
- The MNIS can connect with up to 8 conventional repeater systems, 1 Capacity Plus System or 1 Linked Capacity Plus system.
- Only 1 MNIS can be installed per PC.

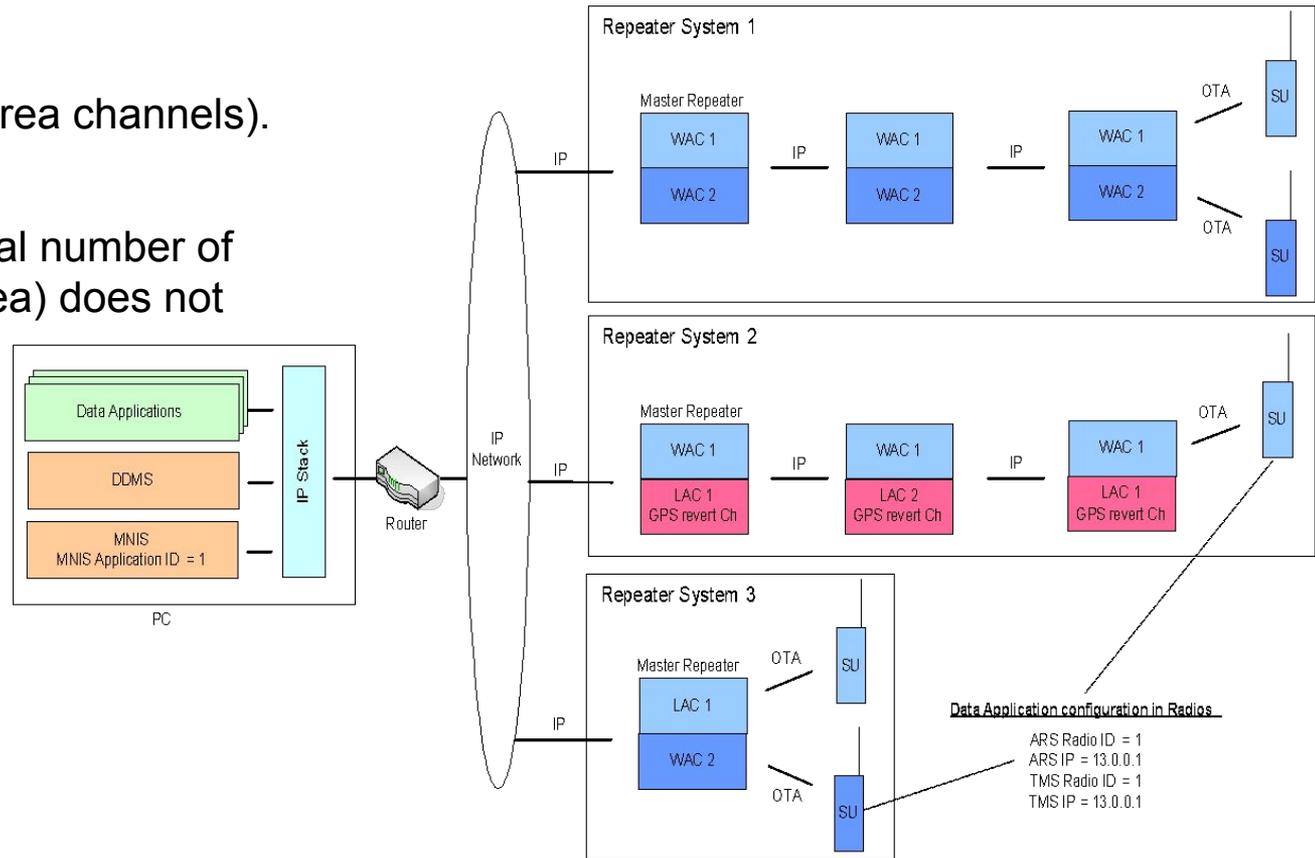
MULTIPLE CONVENTIONAL SYSTEMS TOPOLOGY



MNIS can connect with up to 8 conventional repeater systems (LE Domains) in any combination of:

- Single Site and
- IPSC (with local or wide area channels).

It is recommended that total number of channels (local or wide area) does not exceed 32.

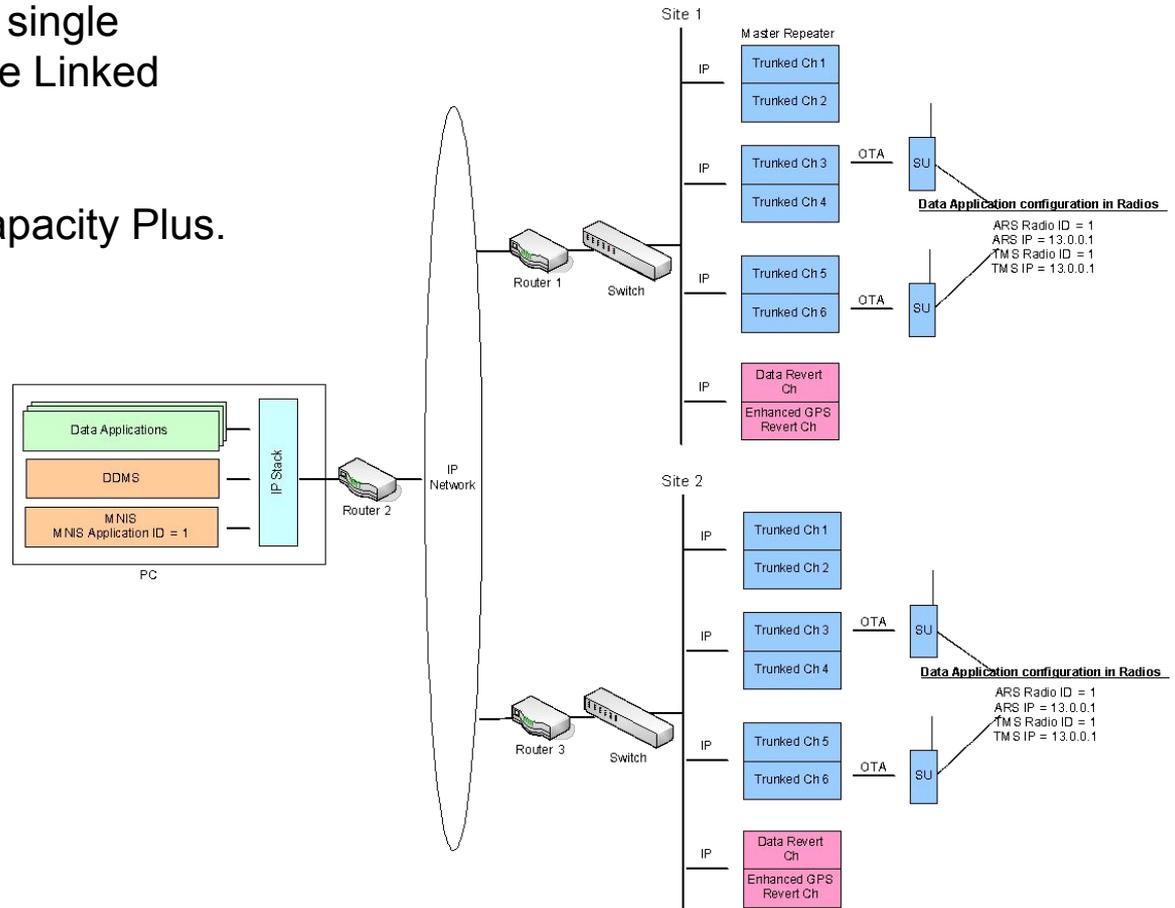


(LINKED) CAPACITY PLUS SYSTEM TOPOLOGY



MNIS can connect with either a single Capacity Plus system or a single Linked Capacity Plus system.

The system shown is Linked Capacity Plus.



SYSTEM TOPOLOGY WITH MULTIPLE MNIS



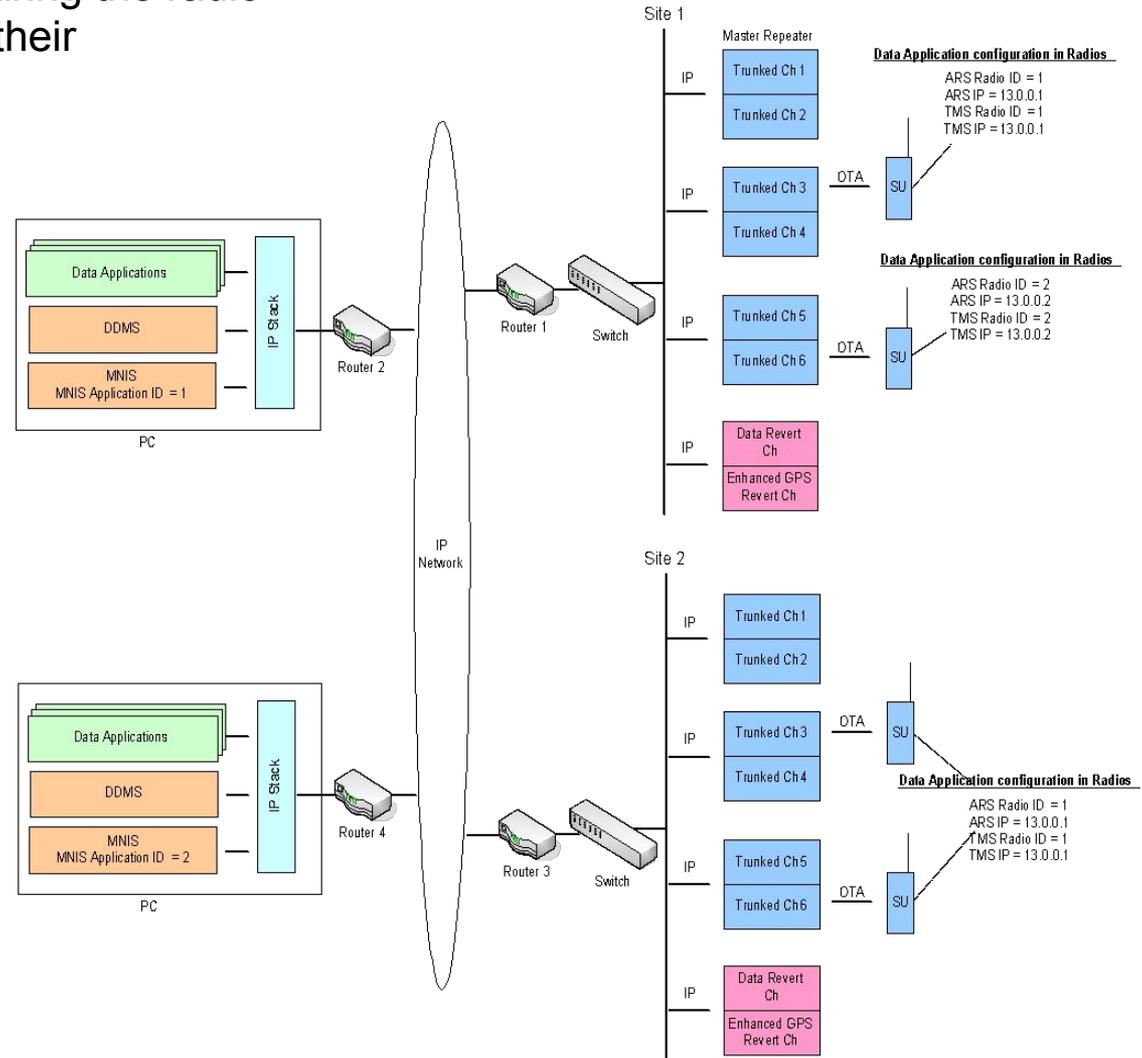
Where two or more agencies are sharing the radio system then each agency can have their independent MNIS deployment.

Up to 4 MNIS allowed_per system.

1 MNIS does not affect the maximum number of sites supported by IPSC / LCP systems.

For 2 or 3 MNIS, it is recommended that the maximum number of IPSC / LCP sites be reduced by 1.

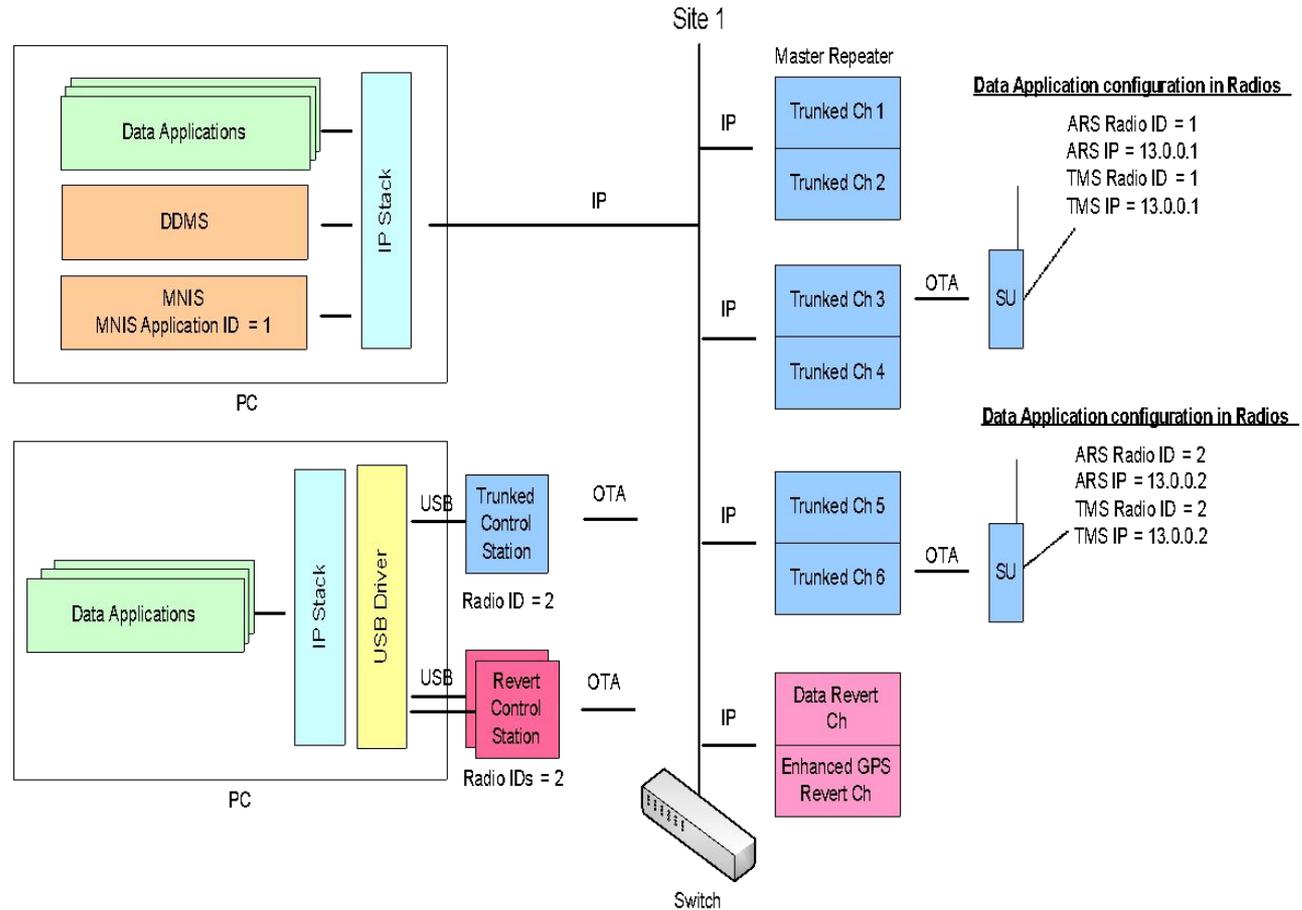
For 4 MNIS, it is recommended that the maximum number of IPSC / LCP sites be reduced by 2.



SYSTEM TOPOLOGY WITH MNIS AND CONTROL STATIONS



Both MNIS and Control Stations can be deployed in the system.

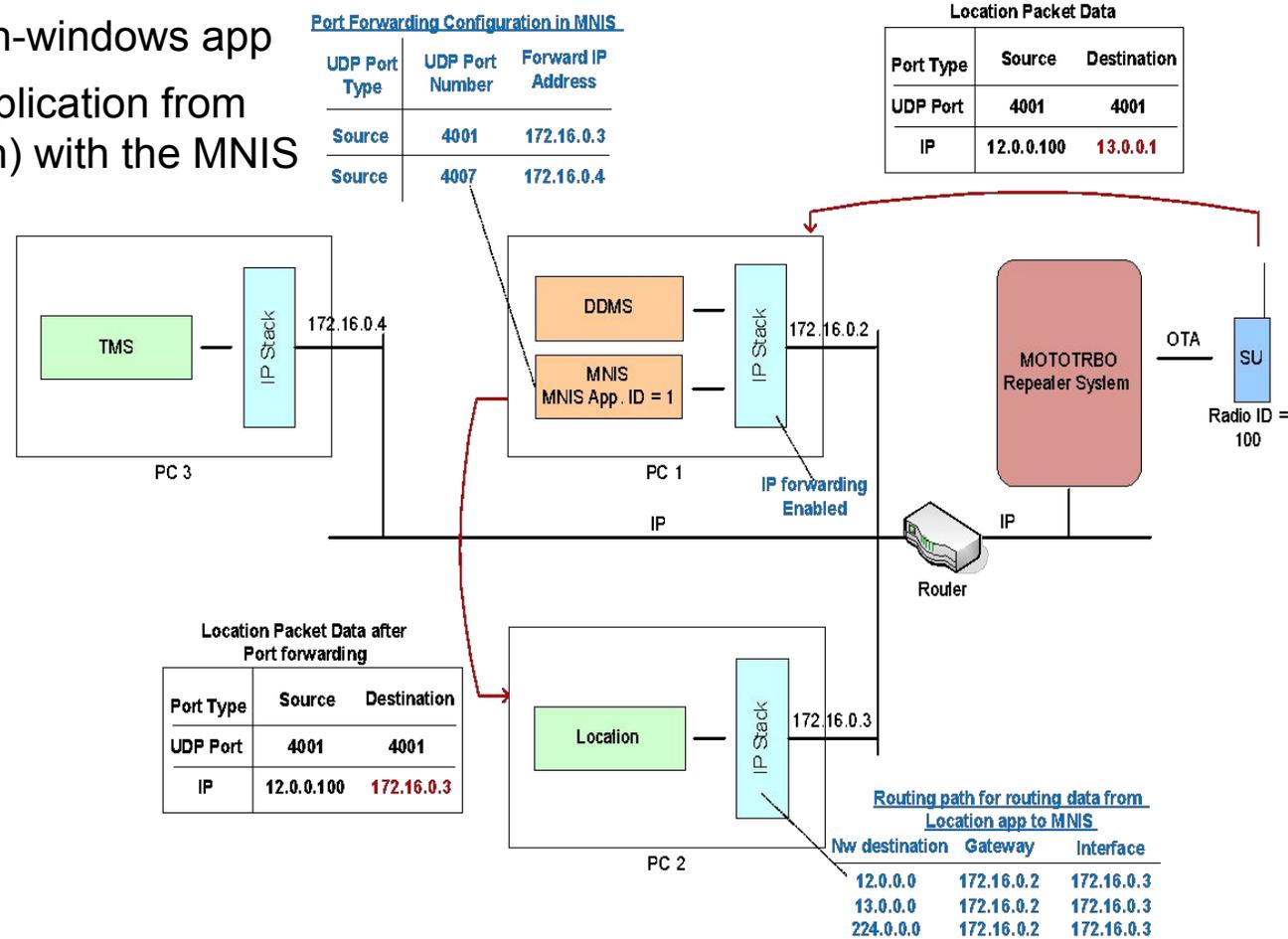


DATA APPLICATIONS ON DIFFERENT PC

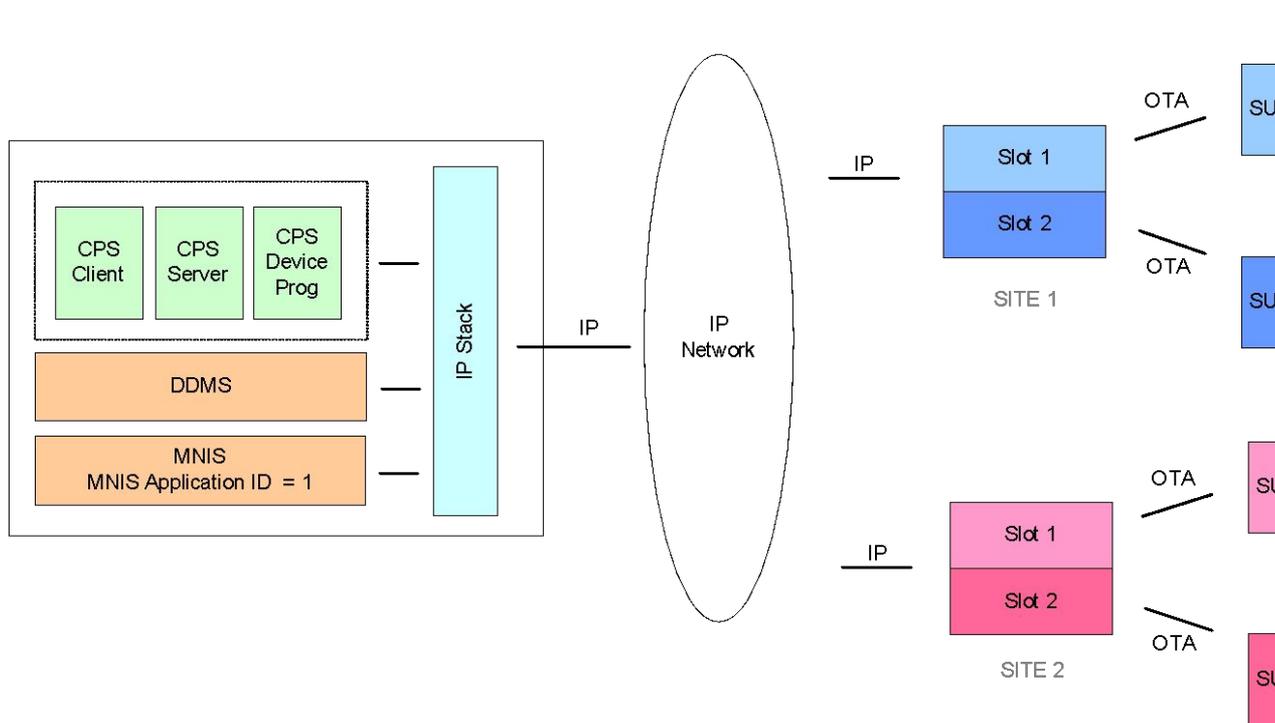


Optionally data applications and MNIS can be on different PCs. This could be done when:

- The data application is a non-windows app
- To prevent unstable data application from interfering (such as OS crash) with the MNIS operation



OTAP WITH MNIS DEPLOYMENT



The considerations for deploying the Radio Management application with MNIS are the same as for any other data application.

The simplest deployment is where Radio Management application (or at least the RM Device Programmer) is deployed on the same PC as the MNIS and DDMS.

The Radio Management application obtains radios' presence information by registering with the DDMS.

DEPLOYMENT WITH OTHER APPS



- MNIS, DDMS, RDAC, Remote Repeater Programming and Radio Management can be deployed on the same PC
 - May require hair pinning router for certain deployments
- MNIS and Wireline Voice Console can be deployed on the same PC
 - Assumes there are no restrictions imposed by Wireline Voice Console
 - May require hair pinning router for certain deployments
- MNIS and Control Station (for voice dispatch) can be deployed on the same PC
 - Assumes the Control Station is not used for data
- Only one MNIS can be deployed per PC
- Only one DDMS can be deployed per PC

RADIO CONFIGURATION



1. Configure ARS Radio ID
2. Configure TMS Radio ID

Notes:

The ARS and TMS Radio IDs are set to the MNIS Application ID.

When migrating from Control Stations to NAI, the radio configuration does not need to change.

The screenshot shows a configuration page titled "Services" with a blue header. It contains two sections for ARS and TMS configuration. The ARS section includes fields for ARS Radio ID (set to 1), ARS IP (13.0.0.1), ARS UDP Port (4005), ARS Monitoring ID (empty), and ARS Monitoring IP (0.0.0.0). The TMS section includes fields for TMS Radio ID (set to 1), TMS IP (13.0.0.1), and TMS UDP Port (4007). A red box highlights the ARS Radio ID field, which is also circled with a red circle containing the number 1. Another red box highlights the TMS Radio ID field, which is also circled with a red circle containing the number 2.

Service	Radio ID	IP	UDP Port	Monitoring ID	Monitoring IP
ARS	1	13.0.0.1	4005		0.0.0.0
TMS	1	13.0.0.1	4007		

REPEATER CONFIGURATION



1. Purchase Network Application Interface Data feature

Note:

Typically the feature will need to be purchased for all repeaters in the system.

Device Features

Feature	Status
Digital	Free
- IP Site Connect	Free
- Capacity Plus	Purchased
- Enhanced Privacy	Free
- Transmit Interrupt	Free
- Dynamic Mixed Mode	<i>Available for Purchase</i>
- Enhanced GPS	Purchased
- Digital Phone Patch	Purchased
- Capacity Plus (Linked)	Free
- Restricted Access to System	Purchased
- Network Application Interface Voice	Purchased
- Network Application Interface Data	Purchased

1

MNIS CONFIGURATION - GENERAL



1. Configure the MNIS to operate in either Conventional (Single Site/IPSC), Capacity Plus or Linked Capacity Plus system operation mode.
2. Configure the MNIS Application ID. The value should be same as the ARS and TMS IDs in the radios.
3. The default MNIS IP Address can be used unless there is another device on the PC that has the same Network ID [192.168.10.xxx] or the RM application (or any other application that needs to communicate with a MOTOTRBO radio via USB) is installed on the PC. For such cases, change the MNIS IP Address.

The screenshot displays the configuration interface for the MNIS. It is divided into two main sections: 'General' and 'Tunnel Network'. The 'General' section contains two fields: 'System Operation Mode' set to 'Conventional' and 'MNIS Application ID' set to '1'. The 'Tunnel Network' section contains three fields: 'MNIS IP Address' set to '192.168.10.1', 'Tunnel IP Address' set to '192.168.10.2', and 'Subnet Mask' set to '255.255.255.0'. Red boxes and numbered callouts (1, 2, and 3) highlight the 'System Operation Mode' and 'MNIS Application ID' fields in the 'General' section, and the 'MNIS IP Address' field in the 'Tunnel Network' section.

General	
System Operation Mode	Conventional
MNIS Application ID	1

Tunnel Network	
MNIS IP Address	192.168.10.1
Tunnel IP Address	192.168.10.2
Subnet Mask	255.255.255.0

MNIS CONFIGURATION - SECURITY



1. Configure the Basic Privacy Key if basic privacy is being used in the system.
2. Configure the Enhanced Privacy Keys if enhanced privacy is being used in the system.
 - The MNIS uses the keys in this list to decrypt a received data message
 - Up to 255 keys with unique IDs can be configured

Security

Basic Privacy Key

Enhanced

Alias	Key ID	Key Value
Enh Privacy Key1	1	0
Enh Privacy Key2	2	123456

MNIS CONFIGURATION – GROUP LIST



Configure the MNIS Group List if the data application is going to send data to a group (such as group text) or receive data as part of a group.

1. Group List Type can either be Conventional (SS/IPSC) or Capacity Plus/LCP.
 - This selection is required to allow MNIS to ensure the group IDs configured are valid for the system type.
2. The Group IDs can be configured in ranges.
 - The list shown represents Groups {1,100, 101,102,103,104,105}.
 - Up to 16 groups or group ranges can be specified.

Group List

Group List Type: Conventional

All Groups:

Group Call ID Ranges

Add Delete

	First Call ID	Last Call ID
	1	1
	100	105

MNIS CONFIGURATION - CONVENTIONAL SYSTEM



1. Configure the IP Address and Port of the Master Repeater.
2. UDP port used by the MNIS is automatically assigned by default. Optionally the UDP port can be assigned manually.
3. The Authentication Key is same as the Authentication Key entered in the Repeaters.
4. Repeater Slot 1:
 - **Enable** - If the data application will be communicating with radios on repeater system Slot 1 then ensure the Slot is enabled.
 - **Revert Channel** – If the repeater system slot 1 is a GPS revert channel then select this field.
 - The MNIS only receives data messages from this channel (it does not route data messages to this channel).
 - **Privacy Setting** – Configure the Privacy Key that the MNIS will use to encrypt data when routing to slot 1 of the repeater system.
 - **Group List** – Select the Group List corresponding to the Groups on the repeater system slot 1.
 - Data messages from a radio to a group in the group list are received by the MNIS.
 - Data messages from a data application to a group in the group list are routed to slot 1 of the repeater system.
5. Repeater Slot 2:
 - Repeat the steps in 4.

IPSC System 1

1. Master IP Address: 70.44.9.195
Master UDP Port: 50000

2. MNIS LE port: Automatically Assigned Manually Assigned (None)

3. Authentication Key: [Empty]

Repeater Slot 1

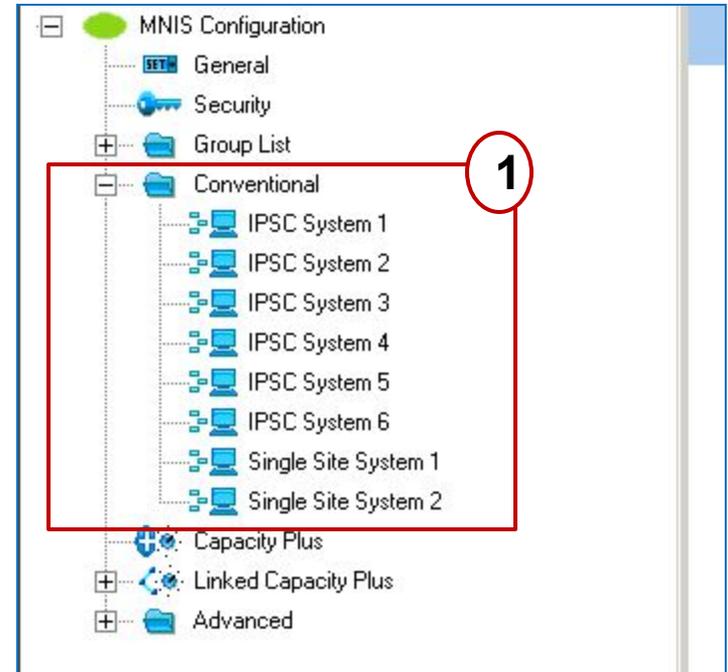
4. Enable:
Revert Channel:
Privacy Setting: Enh Privacy Key1
Group List: Grp List Slot 1

Repeater Slot 2

5. Enable:



1. Up to 8 Conventional Systems can be provisioned into the MNIS.
 - The total number of wide and local channels should be limited to 32.



MNIS CONFIGURATION - CAPACITY PLUS



1. Configure the IP Address and Port of the Master Repeater
2. UDP port used by the MNIS is automatically assigned by default. Optionally the UDP port can be assigned manually.
3. The Authentication Key is same as the Authentication Key entered in the Repeaters.
4. Privacy Setting and Group List:
 - Privacy Setting – Configure the Privacy Key that the MNIS will use to encrypt the data when routing to the Capacity Plus system.
 - Group List – Select the Group List corresponding to the Groups on the Capacity Plus system.
5. Configure the Outbound Data Limit to be the number of data messages that the MNIS can send to the repeater system at a time.
 - This parameter limits the number of channels that can be occupied by the data messages sent from the data applications.

The screenshot shows the 'Capacity Plus' configuration window. It is divided into five sections, each highlighted with a red box and a circled number on the right side:

- 1:** Master IP Address (text box with '70.44.9.195') and Master UDP Port (spin box with '50000').
- 2:** MNIS LE Port. Radio buttons for 'Automatically Assigned' (selected) and 'Manually Assigned' (with a text box containing 'None').
- 3:** Authentication Key (text box with '0').
- 4:** Privacy Setting (dropdown menu with 'Basic') and Group List (dropdown menu with 'Grp List CapPlus').
- 5:** Outbound Data Limit (spin box with '2').

MNIS CONFIGURATION - LINKED CAPACITY PLUS



1. The configuration in this pane is similar to Capacity Plus.

Linked Capacity Plus

Master IP Address

Master UDP Port

MNIS LE Port Automatically Assigned
 Manually Assigned

Authentication Key

Privacy Setting

MNIS CONFIGURATION - LINKED CAPACITY PLUS



2. The Group List can be selected per site. Each Group List defines the Local and Wide Area Groups associated with the site.
 - Data messages from a radio to a group in the group list are received by the MNIS.
 - Data messages from a data application to a group in the group list are routed to the site.

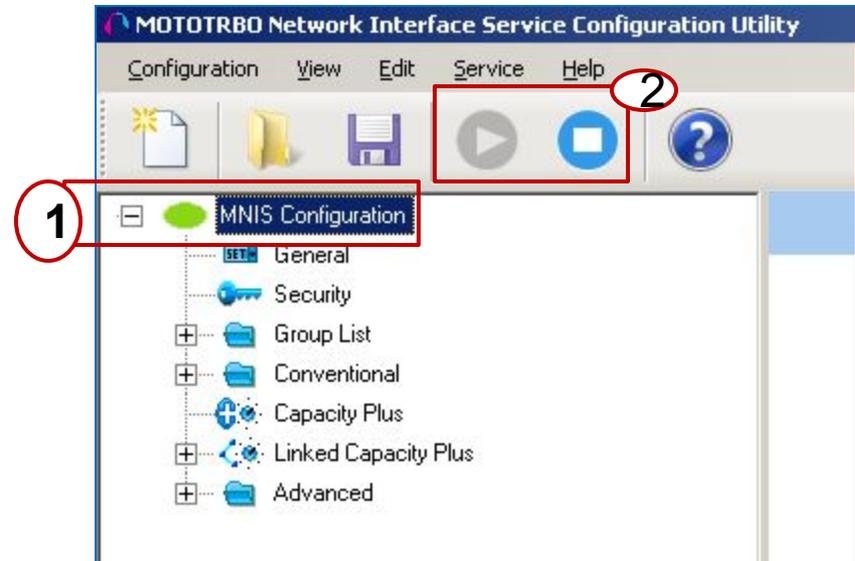
3. Configure the Outbound Data Limit per site.
 - The limit specifies the number of data messages the MNIS can send to the LCP site at a time
 - For the limit function to work correctly, radios should be enabled with ARS on system/site change.

Site Id	Group List	Outbound Data Limit
1	Grp List LCP1	2
2	Grp List LCP2	2

MNIS CONTROLS



1. The Green Color indicates that the configuration is an active configuration, which is being referenced by the MNIS service.
2. Changes to the active configuration will require the MNIS service to be stopped and started again for the changes to apply.



DDMS CONFIGURATION



1. The default configurations for the DDMS in most cases do not need to be changed.
2. The Device Refresh Time can be set in minutes. The DDMS instructs the radios to send ARS within this time.

A screenshot of a configuration window titled "ARS Settings". The window contains a table with the following data:

ARS Settings	
PortSU	4005
PassiveMode	Off
DeviceRefreshTime	240
DeregistrationTO	120
PersistenceTO	12000

The "DeviceRefreshTime" row is highlighted with a red rectangle. A red circle with the number "1" is placed to the right of the "240" value.



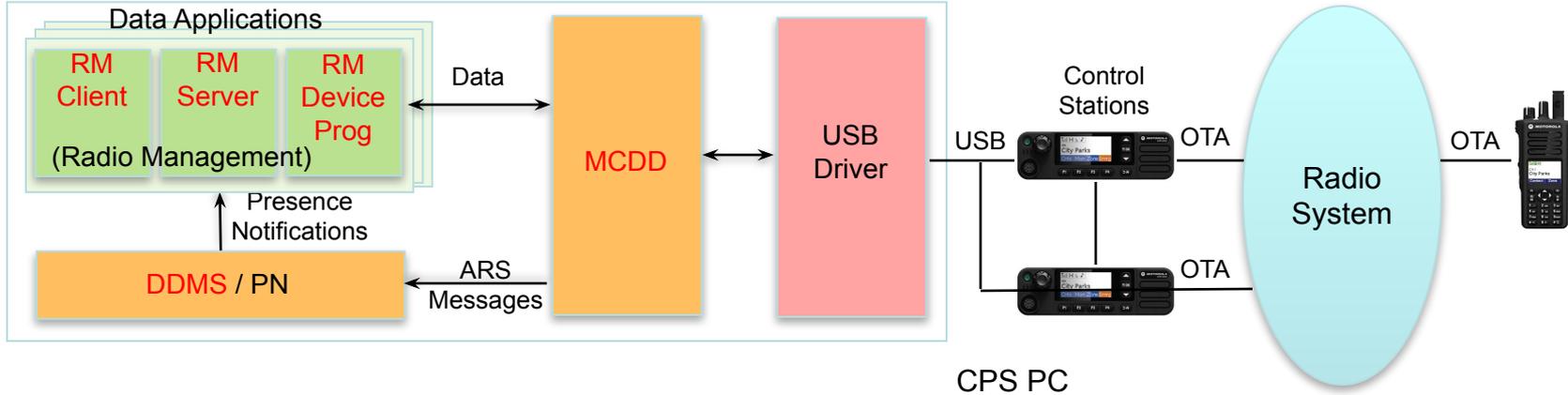
RADIO MANAGEMENT (RM)

All MOTOTRBO radios can be managed and programmed / read using a wired connection. Additionally, the 2000 series, DP3441, SL4000 and 4000 series radios can be programmed / read over the air (OTA).

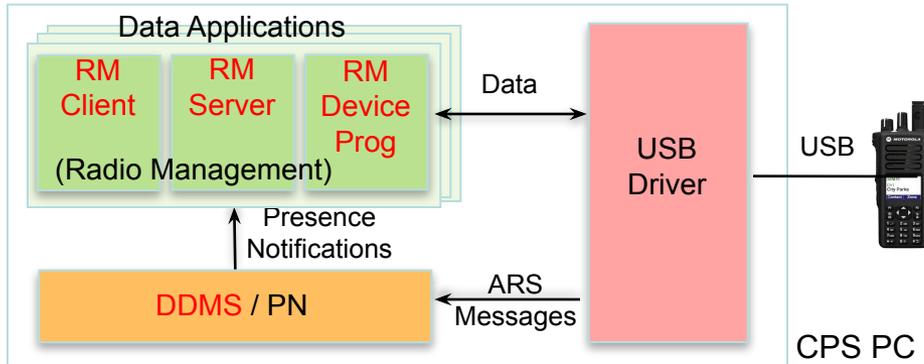
RADIO MANAGEMENT OVERVIEW



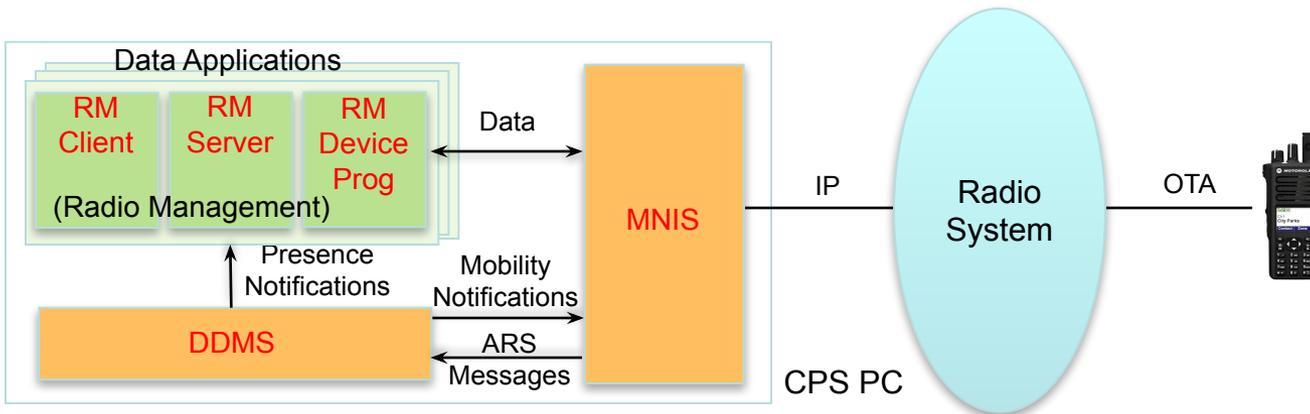
Radio Management Via Control Stations



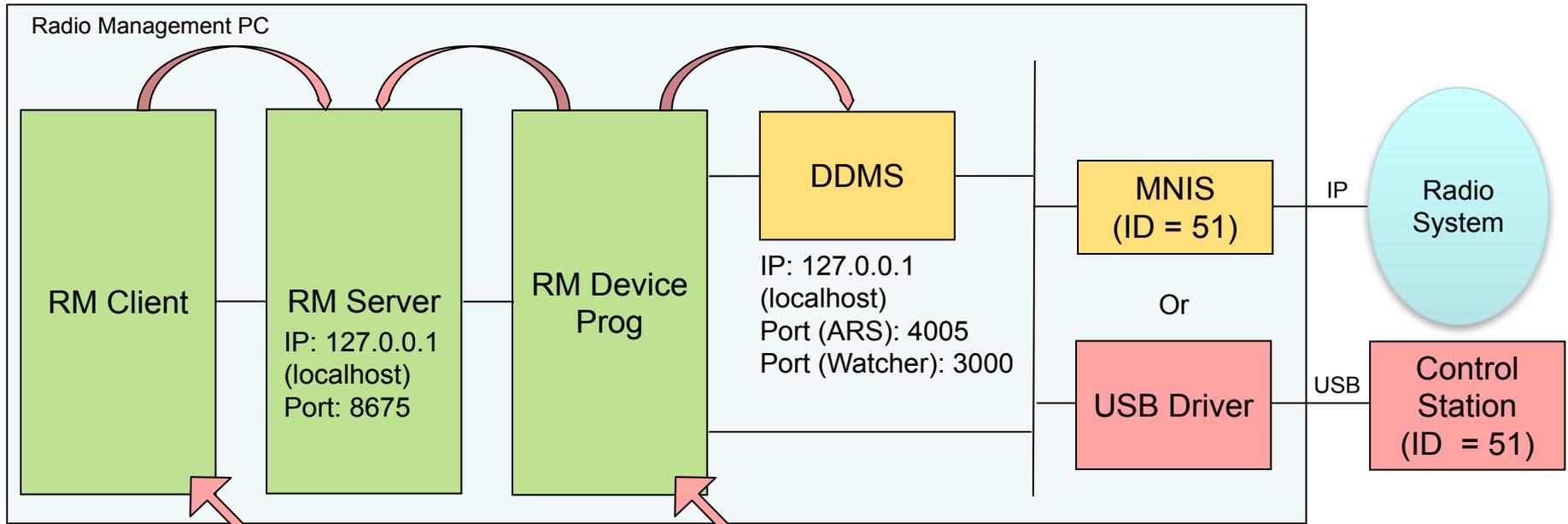
Radio Management Via a Wired Connection



Radio Management Via Network Application Interface



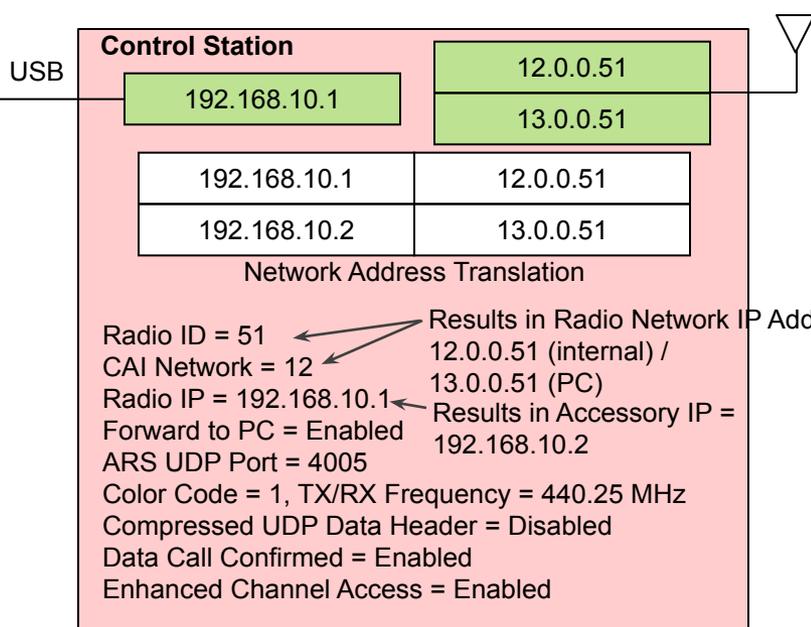
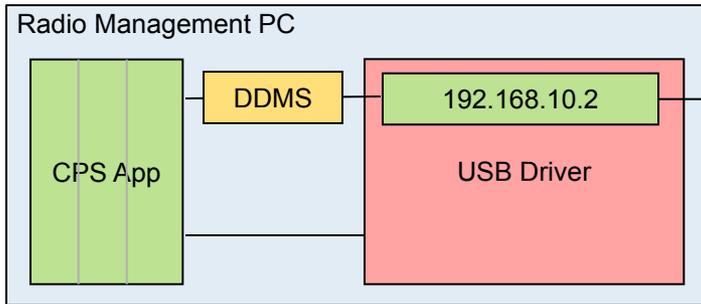
RADIO MANAGEMENT CONFIGURATION EXAMPLE



CPS Client Settings:
Configure CPS Client
to reference Server

Device Programmer Settings:
Configure Device Programmer to
reference Server and DDMS (PN)

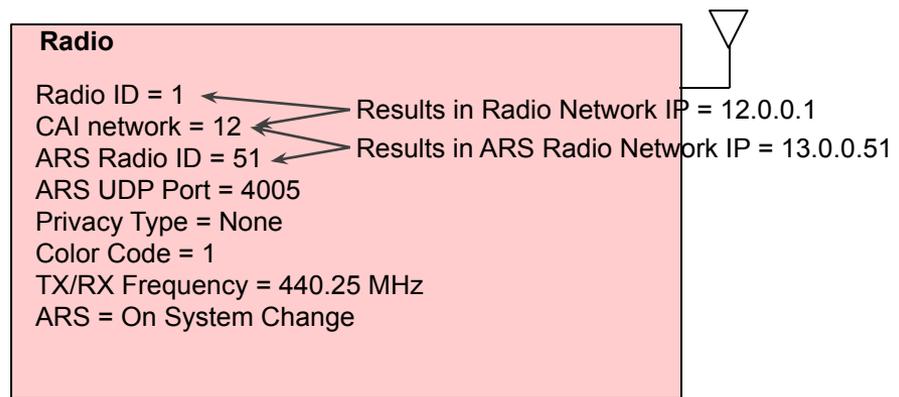
CONTROL STATION / RADIO CONFIGURATION EXAMPLE



Results in Radio Network IP Address = 12.0.0.51 (internal) / 13.0.0.51 (PC)

Results in Accessory IP = 192.168.10.2

Note: The radio configuration is the same irrespective of whether Control Stations or NAI is used.



RM CLIENT SCREEN



Actions Schedule Job Search Field Job View

Radio View

Serial Number	Radio Alias	Template	Group	Modified	Job Status	Model Number
<p>Actions: Performs many of the actions within RM, such as populating the RM server, adding template groups, managing templates, managing keys, managing firmware, managing voice announcement files, managing language packs, managing RM licenses and changing server settings</p> <p>Schedule Job: Schedules Read or Write jobs via the wire or over-the-air, and includes switchover parameters</p> <p>Search : Allows for filtering of RM entries (e.g. template names)</p> <p>Radio View: Main RM screen that lists all radios in the database</p> <p>Job View: Provides a history of all jobs, including the job status</p> <p>Groups: Where groups of customer configuration templates can be added, deleted or edited, for more organized management</p>						

6 Radios

Add Group Templates

RECOMMENDED RM SERVER POPULATION METHOD



The recommended RM Server population method includes a 'Wire Read' of the radio to ensure that both the radio's personality and tuned data get loaded into the RM Server (note: a radio's tuned data is needed for RM firmware upgrade that radio).

1. Radio View: Click "Actions > New Radio" and enter radio's serial number.
2. Radio View: Select the new radio, then right click "Schedule Job > Read ('Wired' mode)" and connect the radio to be read.
3. Define the Radio ID and the radio's basic system parameters (i.e. Privacy Keys, CAI, ARS option, ARS UDP Port, Tx/Rx Frequencies, ARS option etc.).
 - The basic system parameters enable the radio to be contacted 'over the air' by RM
 - If the basic system parameters were previously programmed into the radio then only the Privacy Keys (which cannot be read) will need to be defined
 - The basic system parameters can be defined by selecting a previously defined Template.
4. Radio View: Select the new radio, then right click "Schedule Job > Write ('Wired' mode)" and connect the radio to be written.

RECOMMENDED TEMPLATE MANAGEMENT METHOD



- ❑ A Template consists of that codeplug data which is common to all radios in a given fleet (i.e. all radios that share a common Template).
- ❑ Whenever a radio is Read, a default Template is created from the radio's personality.
- ❑ On populating the RM Server with the first radio in a fleet, edit the Template and save the template using a meaningful Template name.
- ❑ On populating the RM Server with the subsequent radios in a fleet, select the previously saved Template.
- ❑ Once the RM Server has been populated with all radios in a fleet, editing that fleet's Template enables changes to be propagated automatically to all radio personalities linked to the Template.

CONFIGURATION MANAGEMENT CONSIDERATIONS



- ❑ If the radio user is allowed to make changes via the radio front panel, these updates will not be retained after an OTAP or Wired Write (delivery).
 - The configuration in the RM Server will overwrite what is in the radio when delivered

- ❑ Similar to current CPS - the OTAP user must Read (retrieve) the radios over the air first, make individual updates to each, and then Write (deliver) the new configurations in order to retain the previous changes made by the radio user.

- ❑ If using a Template configuration to program a group of radios, there is no way to retain any individual changes that the radio users had made
 - All radios will be updated to match what is in the Template, with the exception of the radio identity information.

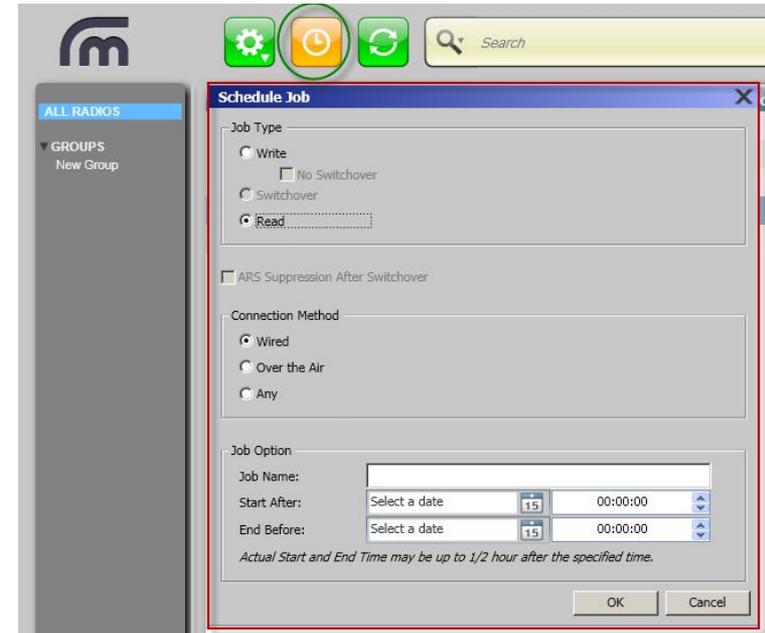
- ❑ Programming radios with an unmanaged (not connected to RM Server) wired CPS will make the radio to be out of sync with the RM Server. This will cause the next over the air operation to take longer since the entire configuration must be Read (retrieved) or Written (delivered)

DELIVER / WRITE MODIFIED RADIO CONFIGURATIONS



- RM allows scheduling of multiple radio configurations to be delivered over the air unattended.
- RM will start the delivery at a scheduled time and continue until all selected radios are either Complete, Errored, or Cancelled.
- Voice can coexist with the OTAP data, although system performance (voice access time, and data throughput) may be degraded slightly.
- It is recommended that OTAP operations are scheduled during time of low radio system activity
- After the delivery is successful, the radio status will be “**Switchover Required**”

Schedule a Job



Job View



RM Device Programmer



APPLY (SWITCH OVER) OF DELIVERED RADIO CONFIGURATIONS



- ❑ **Delivery with Switchover** - radio will apply the changes after delivery
 - Use when changing non-critical parameters: address book entries or button configurations
 - Switchover timer is set to zero by default in which case the switchover occurs immediately upon receiving the switchover message. If the switchover timer is set greater than zero, the radio user will receive a prompt to Accept or Delay the Switchover
 - Accept- immediately reset and apply the changes
 - Delay, or no selection, the radio will wait until the switchover timer expires to reset and apply the changes
- ❑ **Delivery without Switchover** - radio will not apply the changes after delivery. Switchover job must scheduled separately
 - Use when changing critical communication parameters: TX or RX frequencies, color codes, privacy keys, etc.

Schedule Job

Job Type

- Write
- No Switchover
- Switchover
- Read

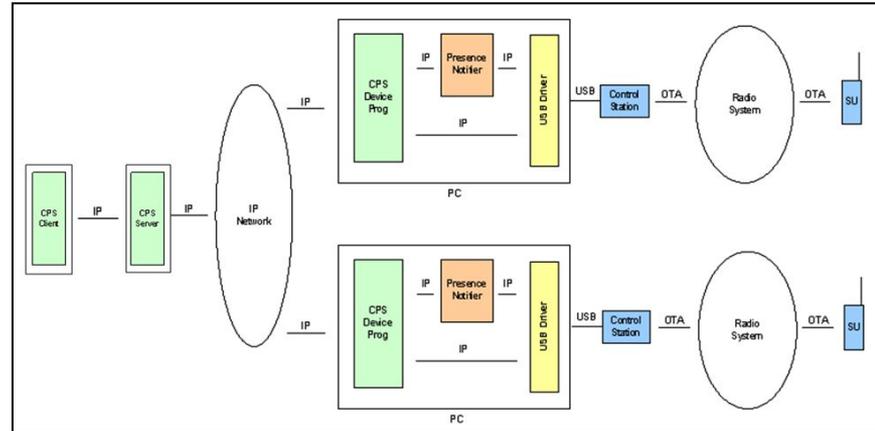
ARS Suppression After Switchover

- For Non critical changes, (address book entries or button layout) ARS can be suppressed .
- If 3rd Party Application require presence be sent after a power cycle, or critical communication parameters are changed, ARS should not be suppressed after a switchover.

CONFIGURATION - GENERAL



- The Client, Server and Device Programmer can be installed in any combination on multiple machines.
- The Server 1.1 (onwards) can support up to 128 remote Device Programmers and up to 16 remote Clients.
- Unless using NAI, the Device Programmer and Control Stations must be within RF coverage of target units (note: the Server does not).
- Continuous direct network connection is required between the Server and Device Programmers(**VPN or Private Network**) .
- If a continuous network connection is not possible, a Remote Client Configuration with Multiple Servers is required.
- If a PN is used, the Device Programmer where the target radio is registered will service jobs for that radio.
- If a PN is not used the Device Programmer can be configured to service a specified set of radios (defined by a group within the Server).





UNIQUE RADIO ID

- When using a centralized RM Server to communicate to multiple systems with remote Device Programmers, then all radios across these systems must contain unique radio IDs.
- If this is not achievable, then:
 - A separate CPS Server must be used for each system
or
 - Radios must be combined into Groups in the RM Server and each remote Device Programmer set to service a specific Group

NOTE: The requirement that within the SAME System there are no duplicate Radio IDs remains, however for duplicate Radio ID's across different Systems, the Group assignment can be used.

RM DEVICE PROGRAMMER

- AUTOMATICALLY PROCESS JOBS (WIRED MODE)

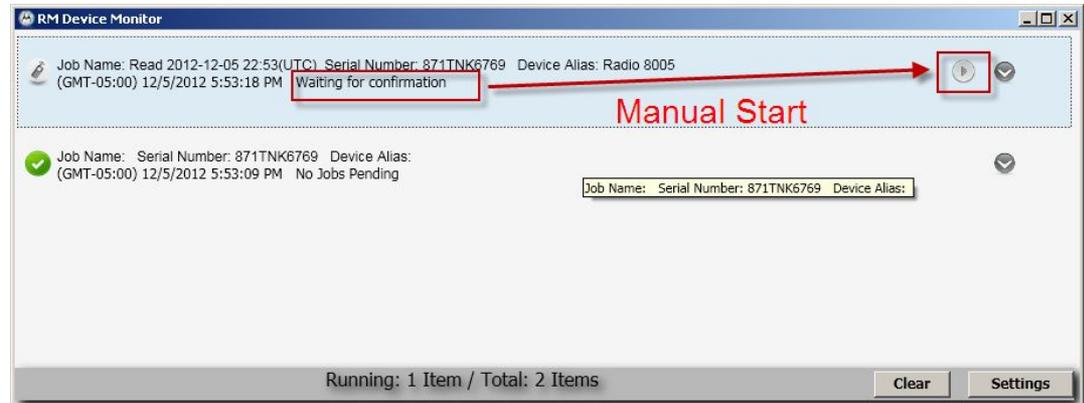
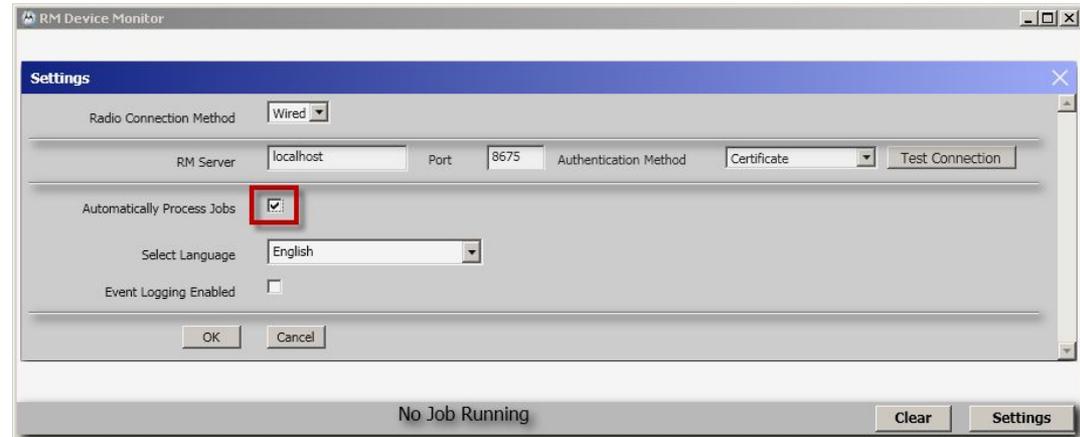


RM Device Programmer in Wired mode:

Check “**Automatically Process Jobs**” to execute Read/Write jobs immediately

Otherwise

Manually clicking the **Play** button will be required for every new Read/Write

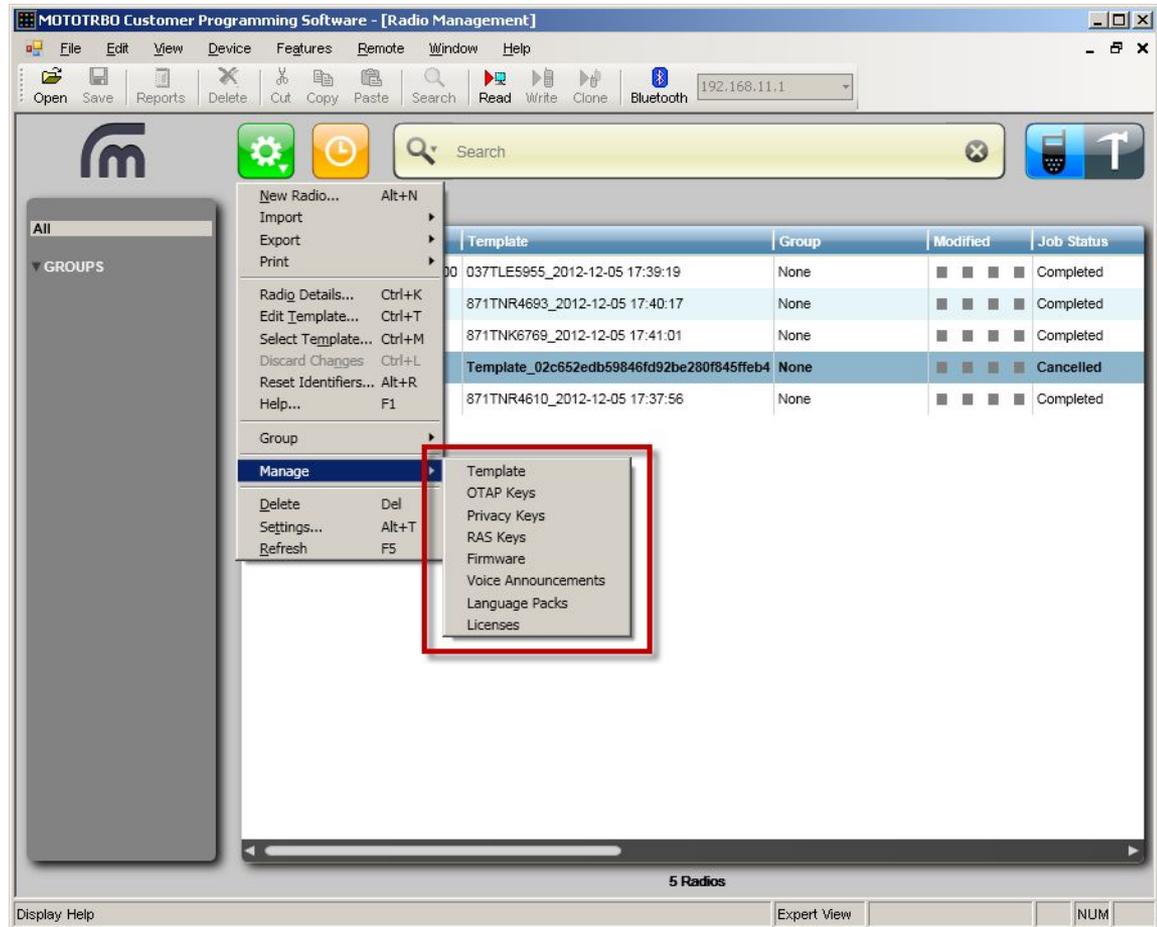


MANAGE OPTIONS

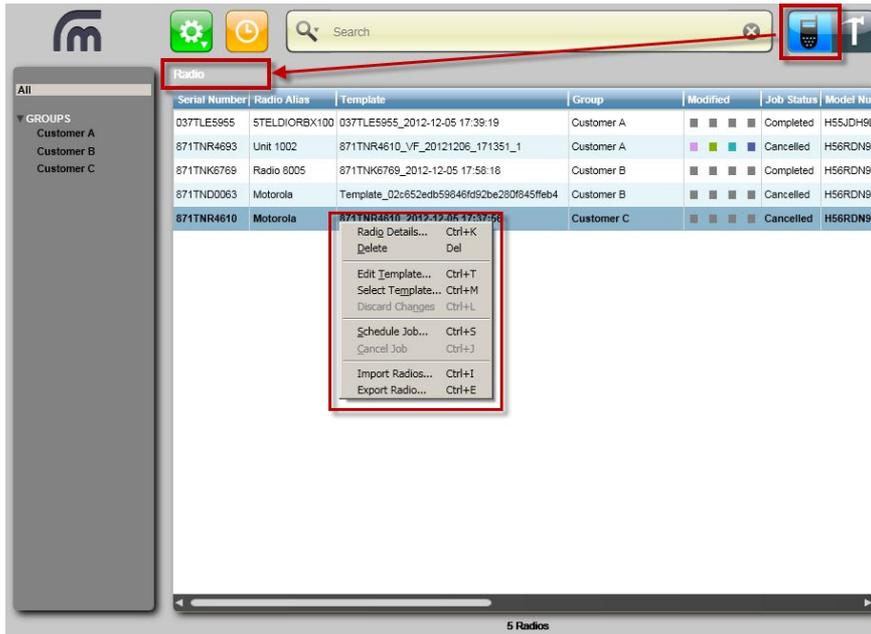


Manage:

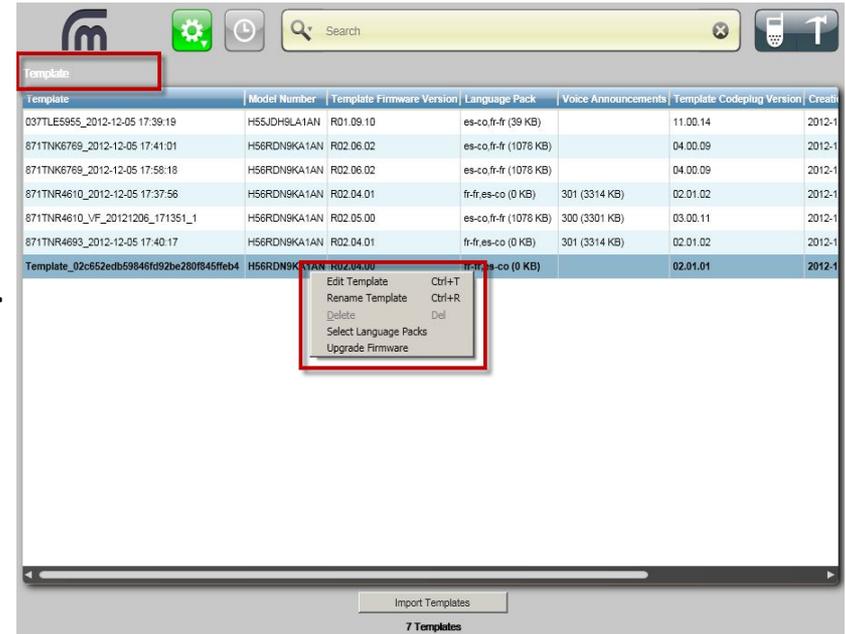
- Templates
- Voice Announcements
- Language Packs
- Enhanced Privacy Keys
- OTAP Keys
- RAS Keys
- Firmware



MANAGE TEMPLATES



<VS>



Radio View



Radio Button

- Import New Radios
- Edit Radio Alias / ID / CIA / IP Address
- Select Groups / Templates
- Edit Templates (Voice Announce, Channels, Talkgroups, Privacy, RAS, etc)
- Schedule Jobs

Template View



Actions > Manage > Template

- Rename
- Delete
- Edit (Voice Announce, Channels, Talkgroups, Privacy, RAS, etc)
- Select Language Packs
- Upgrade Firmware

MANAGE VOICE ANNOUNCEMENTS



- To view and manage VA (Voice Announcement) files in RM Server go to: **Actions > Manage > Voice Announcements**
- Import VA files from RM Client to RM Server (local or remote)
- Edit Templates to select required VA files
- Schedule Jobs to Write to radios

Notes:

1. Custom recorded VA files can also be imported
2. VA files can only be programmed to radios using 'Wired Mode'

The screenshot displays the 'Voice Announcements' management interface. At the top, there is a search bar and navigation icons. Below is a table listing various announcement files. An 'Import Voice Announcement Files' dialog box is open, showing a file explorer view of the 'voiceannouncement' directory. The dialog lists numerous .wav files, including 'action_list.wav', 'all_alert_tones_off.wav', 'backlight_auto_off.wav', 'battery_high.wav', 'battery_low.wav', 'bluetooth_connect.wav', 'bluetooth_disconnect.wav', 'bluetooth_discoverable_off.wav', 'bluetooth_discoverable_on.wav', 'brightness.wav', 'brightness_level1.wav', 'brightness_level2.wav', 'brightness_level3.wav', 'brightness_level4.wav', 'button_press_bad.wav', 'button_press_good.wav', 'call_alert.wav', 'call_forwarding_clear.wav', 'call_forwarding_set.wav', 'call_log.wav', 'channel_1.wav', 'channel_2.wav', 'channel_3.wav', 'channel_4.wav', 'channel_5.wav', 'channel_6.wav', and 'channel_7.wav'. The 'File name' field contains '"channel_5.wav" "channel_1.wav" "channel_...' and the 'Files of type' is set to 'Voice Announcement Files (*.mva;*.wav)'. A red box highlights the 'Import Voice Announcement Files' button at the bottom of the dialog.

Name	Size(KB)	Import Date	In-Use(Templates)	Comments
action_list.mva	6	2012-12-05 12:15	0	
all_alert_tones_off.mva	14	2012-12-05 12:16	0	
all_alert_tones_on.mva	14	2012-12-05 12:16		
backlight_auto_off.mva	13	2012-12-05 12:16		
backlight_auto_on.mva	12	2012-12-05 12:16		
battery_high.mva	8	2012-12-05 12:16		
battery_low.mva	7	2012-12-05 12:16		

MANAGE LANGUAGE PACKS



- To view and manage Language Pack files in RM Server go to:
Actions > Manage > Language Packs
- Import Language Pack files from RM Client to RM Server (local or remote)
- From Template View, select required Language Packs for Templates
- Schedule Jobs to Write to required radios

Notes:

1. Language Packs can only be programmed to radios using 'Wired Mode'.

The screenshot shows the MOTOTRBO Customer Programming Software interface. The main window displays a table of Language Packs with the following data:

Language	Locale	Version	Product Family	Size(KB)	Import Date	In-Use(Templates)	Comments
Español	es-co	1.3	MOTOTRBO SL	539	2012-12-05 12:22	0	
Français	fr-fr	1.3	MOTOTRBO SL	539	2012-12-05 12:22	0	
Español	es-co	1.3	MOTOTRBO 2.0	539	2012-12-05 12:22	0	
Español	es-co	2.1	MOTOTRBO 1.0	20	2012-12-05 12:22	0	
Français	fr-fr	2.1	MOTOTRBO 1.0	19	2012-12-05 12:22	0	
Français	fr-fr	1.3	MOTOTRBO 2.0	539	2012-12-05 12:22	0	

An 'Import Language Packs' dialog box is open, showing a list of language packs to be imported:

Language	Locale	Version	Product Family	Size(KB)
Español	es-co	2.1	MOTOTRBO 1.0	20
Français	fr-fr	2.1	MOTOTRBO 1.0	19
Español	es-co	1.3	MOTOTRBO 2.0	539
Français	fr-fr	1.3	MOTOTRBO 2.0	539
Español	es-co	1.3	MOTOTRBO SL	539
Français	fr-fr	1.3	MOTOTRBO SL	539

The 'Import' button in the dialog box is highlighted with a red box. Additionally, the 'Import Language Packs' button in the main window's toolbar is also highlighted with a red box. The status bar at the bottom indicates '6 Language Packs'.

MANAGE KEYS



- To view and manage Secure keys in RM Server go to one of the following:
 - Actions > Manage > OTAP Keys
 - Actions > Manage > Privacy Keys (Enhanced Privacy)
 - Actions > Manage > RAS Keys
- Key repository shows all keys available for all radios in RM Server
- Add any new keys required
- Edit Templates to select required keys
- Schedule Jobs to Write to required radios

The screenshot displays the MOTOTRBO Customer Programming Software interface. The main window shows a table of OTAP Keys with the following data:

Key ID	Key Alias	Key Value	In-Use(Radios/Templates)	Comments
1001	Shcaumburg IPSC	12341234	0	
1002	Downtown Cap+	987654321	0	
1003	Miami LCP	123123123	0	

An 'Add OTAP Key' dialog box is open, showing the following fields:

- Key ID: 5001
- Key Alias: New York - SI
- Key Value: 5647383921

The 'OK' button in the dialog box and the 'Add key' button at the bottom of the main window are highlighted with red boxes. The status bar at the bottom indicates '3 OTAP Keys'.

MANAGE FIRMWARE



- To view and manage Firmware Packages in RM Server go to: **Actions > Manage > Firmware**
- Import Firmware Packages from RM Client to RM Server (local or remote)
- From Template View, select required firmware versions for Templates
- Schedule Jobs to Write to required radios

Notes:

1. A Template can be upgraded to any applicable newer firmware version available in RM Server
2. After an upgraded Template has been created, radios containing un-upgraded firmware cannot select that Template
3. Templates for radios containing R1.X firmware cannot be upgraded
4. Only radios previously 'Wire Read' into RM Server can be firmware upgraded via a Template
5. Radios can only be firmware upgraded using 'Wired Mode'

The screenshot shows the MOTOTRBO Customer Programming Software interface. The main window displays a table of Firmware Packages. An 'Import Firmware' dialog box is open, showing a list of firmware packages to be imported. The 'Import' button in the dialog is highlighted with a red box. The 'Import Firmware' button in the main window is also highlighted with a red box.

Name	Version	Size(KB)	Import Date	Codeplug	In-Use(Radios)	Comments
MOTOTRBO 2.0 R020500_030011 Mobile Update Packages	R02.05.00	40904	2012-12-05 13:00	03.00.11	0	
MOTOTRBO SL R020500_030011 Portable Update Packages	R02.05.00	65642	2012-12-05 13:00	03.00.11	0	
MOTOTRBO 2.0 R020500_030011 Portable Update Packages	R02.05.00	78834	2012-12-05 12:59	03.00.11	0	

Name	Firmware	Codeplug	Size(KB)
MOTOTRBO 2.0 R020500_030011 Portable Update Packages	R02.05.00	03.00.11	78834
MOTOTRBO SL R020301_020101 Portable Update Packages	R02.03.01	02.01.01	64033
MOTOTRBO SL R020500_030011 Portable Update Packages	R02.05.00	03.00.11	65642
MOTOTRBO 2.0 R020500_030011 Mobile Update Packages	R02.05.00	03.00.11	40904

MULTI-RADIO PROGRAMMING (WIN 7)



- Automatic sequential programming of up to 16 radios simultaneously connected via USB
- Each radio MUST have a unique Radio ID and a unique Radio IP (in a unique **subnet**)
- RM Device Programmer MUST run on a Windows 7 machine

Preparation (from Radio View):

1. For each new radio, click **Actions > New Radio** and enter serial number
2. Select all new radios, then right click **Schedule Job > Read ('Wired' mode)** and connect each radio in turn to be read
3. Select all new radios, then right click **Select Template** and select a single common template
4. Assign a unique Radio ID and a unique Radio IP (in a unique **subnet**) to each new radio
5. Select all new radios, then right click **Schedule Job > Write ('Wired' mode)** and connect each radio in turn to be written

Once they have been prepared, up to 16 radios (assigned to a common template) can be connected simultaneously via USB and automatically 'programmed in sequence.

Serial Number	Radio Alias	Template	Modified	Job Status
037TLE5955	5TELDIORBX100	037TLE5955_2012-12-05 17:39:19	■ ■ ■ ■	Completed
871TNR4693	Unit 1002	871TNR4610_VF_20121205_182955232500	■ ■ ■ ■	Running. Processing Job
871TNK6789	Radio 8005	871TNK6789_2012-12-05 17:58:18	■ ■ ■ ■	Completed

THANK YOU...



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