BroadSoft Partner Configuration Guide

New Rock MX Series VoIP Gateway

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BroadWorks® Guide

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Document Revision History

Version	Reason for Change
1.1	Introduced document for New Rock MX Series VoIP Gateway version 347 validation with BroadWorks Release 21.sp1.
1.2	Edited and published document.

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1 Overview

This guide describes the configuration procedures required for the New Rock Technologies MX Series VoIP Gateway for interoperability with BroadWorks. This includes the following models:

- HX4E
- MX8A

The MX Series VoIP Gateway is an IAD that uses the Session Initiation Protocol (SIP) to communicate with BroadWorks for call control.

This guide describes the specific configuration items that are important for use with BroadWorks. It does not describe the purpose and use of all configuration items on the MX Series VoIP Gateway. For those details, see the *MX Series VoIP Gateway User Manual* [1] supplied by New Rock.

2 Interoperability Status

This section provides the known interoperability status of the New Rock MX Series VoIP Gateway with BroadWorks. This includes the version(s) tested, the capabilities supported, and known issues.

Interoperability testing validates that the device interfaces properly with BroadWorks via the SIP interface. Qualitative aspects of the device or device capabilities not affecting the SIP interface such as display features, performance, and audio qualities are not covered by interoperability testing. Requests for information and/or issues regarding these aspects should be directed to New Rock.

2.1 Verified Versions

The following table identifies the verified New Rock MX Series VoIP Gateway and BroadWorks versions and the month/year the testing occurred. If the device has undergone more than one test cycle, versions for each test cycle are listed, with the most recent listed first.

Compatible Versions in the following table identify specific MX Series VoIP Gateway versions that the partner has identified as compatible so should interface properly with BroadWorks. Generally, maintenance releases of the validated version are considered compatible and may not be specifically listed here. For any questions concerning maintenance and compatible releases, contact New Rock.

NOTE: Interoperability testing is usually performed with the latest generally available (GA) device firmware/software and the latest GA BroadWorks release and service pack at the time the testing occurs. If there is a need to use a non-verified mix of BroadWorks and device software versions, customers can mitigate their risk by self-testing the combination themselves using the *BroadWorks SIP Access Device Interoperability Test Plan* [5].

Verified Versions

Date (mm/yyyy)	BroadWorks Release	MX Series VoIP Gateway Verified Version	MX Series VoIP Gateway Compatible Versions
12/2016	Release 21.sp1	347	None

2.2 Interface Capabilities Supported

The New Rock MX Series VoIP Gateway has completed interoperability testing with BroadWorks using the *BroadWorks SIP Access Device Interoperability Test Plan* [5]. The results are summarized in the following table.

The BroadWorks test plan is composed of packages, each covering distinct interoperability areas, such as “Basic” call scenarios and “Redundancy” scenarios. Each package is composed of one or more test items, which in turn, are composed of one or more test cases. The test plan exercises the SIP interface between the device and BroadWorks with the intent to ensure interoperability sufficient to support the BroadWorks feature set.

The *Supported* column in the tables in this section identifies the New Rock MX Series VoIP Gateway’s support for each of the items covered in the test plan, with the following designations:

- Yes Test item is supported
- No Test item is not supported
- NA Test item is not applicable to the device type
- NT Test item was not tested

Caveats and clarifications are identified in the *Comments* column.

NOTE: *DUT* in the following table refers to the *Device Under Test*, which in this case is the New Rock MX Series VoIP Gateway.

BroadWorks SIP Access Device Interoperability Test Plan Support Table			
Test Plan Package	**Test Plan Package Items**	**Supported**	**Comments**
Basic	Call Origination	Yes	
	Call Termination	Yes	
	Session Audit	Yes	
	Session Timer	Yes	
	Ringback	Yes	
	Forked Dialog	Yes	
	Early UPDATE	Yes	Does not send Early UPDATE.
	Early-Session	No	
	181 Call Being Forwarded	Yes	
	Dial Plan	Yes	
	DTMF – Inband	Yes	
	DTMF – RFC 2833	Yes	
	DTMF – DTMF Relay	Yes	
	Codec Negotiation	Yes	
	Codec Renegotiation	Yes	
BroadWorks Services	Third-Party Call Control – Basic	Yes	
	Voice Message Deposit and Retrieval	Yes	
	Message Waiting Indicator – Unsolicited	Yes	
	Message Waiting Indicator – Solicited	Yes	
	Voice Portal Outcall	Yes	
	Advanced Alerting – Ringing	Yes	
	Advanced Alerting – Call Waiting	Yes	
	Advanced Alerting – Ring Splash	Yes	
	Calling Line ID	Yes	
	Calling Line ID with Unicode Characters	Yes	

BroadWorks SIP Access Device Interoperability Test Plan Support Table			
Test Plan Package	**Test Plan Package Items**	**Supported**	**Comments**
	Connected Line ID	Yes	
	Connected Line ID with Unicode Characters	Yes	
	Connected Line ID on UPDATE	Yes	
	Connected Line ID on Re-INVITE	Yes	
	Diversion Header	Yes	
	History-Info Header	Yes	
	Advice of Charge	No	
	Meet-Me Conferencing	Yes	
	Meet-Me Conferencing – G722	Yes	
	Meet-Me Conferencing – AMR-WB	No	
	Collaborate – Audio	Yes	
	Collaborate – Audio – G722	Yes	
DUT Services – Call Control Services	Call Waiting	Yes	
	Call Hold	Yes	
	Call Transfer	Yes	
	Three-Way Calling	Yes	Does not support Three-Way Call Before Answer.
	Network-Based Conference	No	
DUT Services – Registration and Authentication	Register Authentication	Yes	
	Maximum Registration	Yes	
	Minimum Registration	Yes	
	Invite Authentication	Yes	
	Re-Invite/Update Authentication	Yes	
	Refer Authentication	Yes	
	Device Authenticating BroadWorks	No	
DUT Services – Fax	G711 Fax Passthrough	Yes	
	G711 Fax Fallback	Yes	
	T38 Fax Peer-to-Peer	Yes	
	T38 Fax Messaging	Yes	
DUT Services – Emergency Call	Emergency Call	No	
	Emergency Call with Ringback	No	
DUT Services – Miscellaneous	Do Not Disturb	Yes	
	Call Forwarding Always	Yes	
	Call Forwarding Always Diversion Inhibitor	No	

BroadWorks SIP Access Device Interoperability Test Plan Support Table			
Test Plan Package	**Test Plan Package Items**	**Supported**	**Comments**
	Anonymous Call	Yes	
	Anonymous Call Block	Yes	
	Remote Restart Via Notify	No	
Redundancy	DNS SRV Lookup	Yes	
	Register Failover/Failback	Yes	Does not support Register Failback.
	Invite Failover/Failback	No	
	Bye Failover	No	
SBC/ALG – Basic	Register	Yes	
	Outgoing Invite	Yes	
	Incoming Invite	Yes	
SBC/ALG – Failover/Failback	Register Failover/Failback	Yes	Does not support Register Failback.
	Invite Failover/Failback	No	
TCP	Register	Yes	
	Outgoing Invite	Yes	
	Incoming Invite	Yes	
IPV6	Call Origination	No	
	Call Termination	No	
	Session Audit	No	
	Ringback	No	
	Codec Negotiation/Renegotiation	No	
	Voice Message Deposit/Retrieval	No	
	Call Control	No	
	Registration with Authentication	No	
	T38 Fax Messaging	No	
	Redundancy	No	
	SBC	No	
	Dual Stack with Alternate Connectivity	No	

2.3 Known Issues

This section lists the known interoperability issues between BroadWorks and specific partner release(s). Issues identified during interoperability testing and known issues identified in the field are listed.

The following table provides a description of each issue and, where possible, identifies a workaround. The verified partner device versions are listed with an "X" indicating that the issue occurs in the specific release. The issues identified are device deficiencies or bugs and are typically not BroadWorks release dependent.

The *Issue Number* is a tracking number for the issue. If it is a New Rock issue, the issue number is from New Rock's tracking system. If it is a BroadWorks issue, the issue number is from BroadSoft's tracking system.

For more information on any issues related to the particular partner device release, see the partner release notes.

Issue Number	Issue Description	Partner Version			
		347			
	No issue is identified.				

3 BroadWorks Configuration

This section identifies the required BroadWorks device profile type for the New Rock MX Series VoIP Gateway as well as any other unique BroadWorks configuration required for interoperability with the MX Series VoIP Gateway.

3.1 BroadWorks Device Profile Type Configuration

This section identifies the device profile type settings to use when deploying the New Rock MX Series VoIP Gateway with BroadWorks.

Create a device profile type for the New Rock MX Series VoIP Gateway as shown in the following example. A separate device profile type should be created for each New Rock MX Series VoIP Gateway model. The settings shown are recommended for use when deploying the New Rock MX Series VoIP Gateway with BroadWorks. For an explanation of the profile parameters, see the *BroadWorks Device Management Configuration Guide* [2].

The following device profile type shown provides the *Number of Ports* (number of SIP lines) setting for New Rock MX Series VoIP Gateway model HX4E. For other MX Series VoIP Gateway models, create a new device profile type and set the *Number of Ports* to match the available number of SIP lines per model according to the following table.

Model	Number of Lines
HX4E	4
MX8A	8

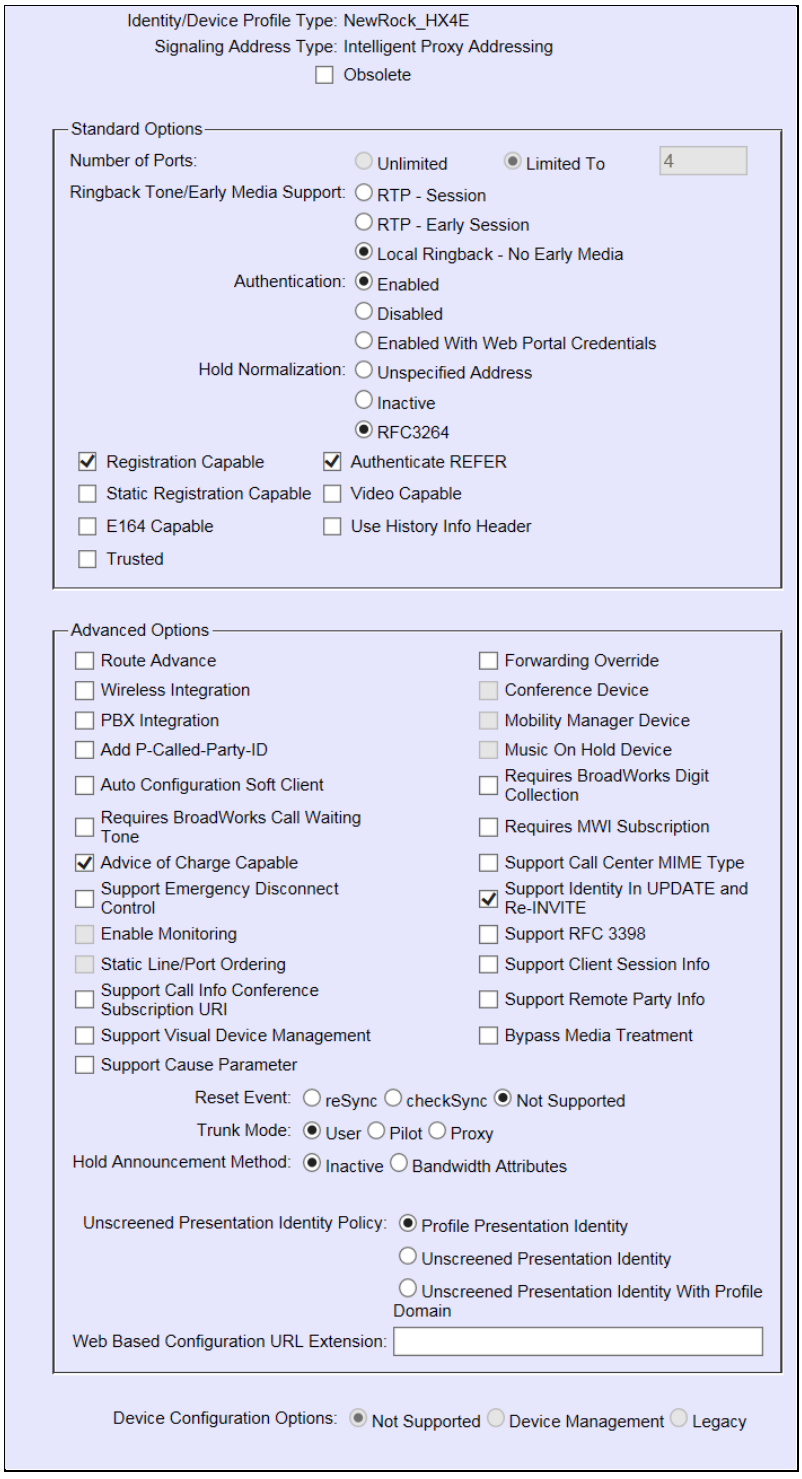

Figure 1 Identity/Device Profile Modify Page

3.2 BroadWorks Configuration Steps

There are no additional BroadWorks configurations required.

4 MX Series VoIP Gateway Configuration

This section describes the configuration settings required for the MX Series VoIP Gateway integration with BroadWorks, primarily focusing on the SIP interface configuration. The MX Series VoIP Gateway configuration settings identified in this section have been derived and verified through interoperability testing with BroadWorks. For configuration details not covered in this section, see *the MX Series VoIP Gateway User Manual* [1] for MX Series VoIP Gateway.

4.1 Configuration Method

MX Series VoIP Gateway provides a Web GUI for configuration interface through HTTPS. The Web GUI can be accessed using browsers such as Internet Explorer 8 to 11, Firefox, and Google Chrome. The default username and password for https://<IP address of MX series> is listed in the following table.

Model	Username	Password
MX8A	admin	mx8
HX4E	admin	hx4

4.2 System Level Configuration

This section describes system-wide configuration items that are generally required for each MX Series VoIP Gateway to work with BroadWorks. Subscriber-specific settings are described in the next section.

4.2.1 Configure Network Settings

MX Series VoIP Gateway starts DHCP service by default, and automatically obtains an IP address on the LAN. However, if the gateway cannot get IP address through DHCP, a factory default IP address 192.168.2.218 is available for its initial web access.

Type	Default DHCP Service	Default IP Address	Default Subnet Mask
MX8A	Enabled	192.168.2.218	255.255.0.0
HX4E	Enabled	192.168.2.218	255.255.0.0

After logging to the device web GUI, go to *Basic* → *Network* to configure Network related settings.

Name	Description
IP address	If “Static IP” or “DHCP” is selected but an address fails to be obtained, the gateways will use the IP address filled in here. If the gateways obtain an IP address through DHCP, the system will display the current IP address automatically obtained from DHCP.
Subnet mask	The subnet mask is used with an IP address. When the gateway uses a static IP address, this parameter must be entered; when an IP address is automatically obtained through DHCP, the system will display the subnet mask automatically obtained by DHCP. It has no default value.
Default gateway	The IP address of LAN gateway. When the gateway obtains an IP address through DHCP, the system will display the LAN gateway address automatically obtained through DHCP. When the gateway uses a static IP address, this parameter must be entered. It has no default value.

Name	Description
DNS server	Obtained automatically: When the connection mode is “DHCP” or “PPPoE”, the device uses the automatically obtained IP address of the DNS server. Specified manually: Use the DNS server addresses specified manually.
Primary DNS Server	If Specified manually is selected, the network IP address of the Primary DNS server must be entered, there is no default value.
Secondary DNS Server	If Specified manually is selected, the network IP address of the Secondary DNS server can be entered, there is no default value.

4.2.2 Configure SIP Interface Settings

After login to the device web GUI, click *Basic* → *SIP* to configure SIP server related settings.

Name	Description
Local Signaling port	Configure the UDP port for transmitting and receiving SIP messages, with its default value 5060.
Registrar server	Configure the address and port number of the SIP registration server. The address and port number is separated by “:”. It has no default value. The register server address can be an IP address or a domain name. For example: as.iop1.broadworkds.net:5060. When a domain name is used, DNS service must be activated and DNS server parameters must be configured on the network-configuration page
Proxy server	Configure the IP address and port number of the SIP proxy server. The address and port number is separated by “:”. It has no default value. The proxy server address can be set to an IP address or a domain name. For example: as.iop1.broadworkds.net:5060. When a domain name is used, DNS service must be activated and DNS server parameters must be configured on the network-configuration page.
Subdomain name	This subdomain name will be used in INVITE and REGISTER messages. If it is not set here, the gateways will use the IP address or domain name of the proxy server as the user-agent domain name. It has no default value. When an outbound proxy is deployed with BroadWorks Application Servers, the registrar and proxy server should be set as the outbound proxy address, for example, sbc1.iop1.broadworks.net; the subdomain name should be set as the Application Server address, for example, as.iop1.broadworks.net.
Registration expiration	Valid time of SIP re-registration in seconds. Its default value is 600.

4.2.3 Configure Service Settings

4.2.3.1 Configure Dial Plan Settings

After login to the device web GUI, click *Routing* →*Digit Map* to configure dialing rules.

Dialing rules are used to effectively detect completed received number sequences that are ready to be sent to reduce connection time of telephone calls.

The maximum number of rules that can be stored in gateways is 250. Each rule can hold up to 32 numbers and 38 characters. The total size of the dialing rules table (all dialing rules) can be up to 2280 bytes.

The default digit map only contains system function rules. To customize the digit map, choose the country in *Advanced* → *Tones* and input the rules in the text box. The following provides descriptions of typical rules:

Name	Description
*x.T	After receiving * and any one-digit number, the device terminates receiving digits and sends detected numbers if the duration of no dialing period exceeded the value of the *Interdigit timer* parameter.
*1xx	The gateway terminates receiving digits after receiving 4 digits starting with *1.
[2-9]11	The gateway terminates receiving digits after receiving 3 digits starting with any digit except 0 or 1 and ending with 11.
[0-1][2-9]xxxxxxxxx	The gateway terminates receiving digits after receiving 11 digits whose 1st digit is 0 or 1 and 2th digit is not 0 or 1.
[2-9]xxxxxxxxx	The gateway terminates receiving digits after receiving 10 digits starting with any digit except 0 or 1.
011xxx.T	After receiving 6 digits starting with 011, the device terminates receiving digits and sends detected numbers if the duration of no dialing period exceeded the value of the *Interdigit timer* parameter.
xxxxxx.T	For a number with 6 digits, or less than 6 digits, the device terminates receiving digits and sends detected numbers if the duration of no dialing period exceeded the value of the *Interdigit timer* parameter. For a number with more than 6 digits, the device terminates receiving digits and sends detected numbers if the duration of no dialing period exceeded the value of the *Complete entry timer* parameter. *Interdigit timer* and *Complete entry timer* can be set on *Basic* → *System* page.
x.#	If subscribers press # key after dial-up, the gateways will immediately terminate the process of receiving digits and send all the numbers before # key.
#xx	Terminate after receiving # and any two-digit number. #xx is primarily used to stop function keys for supplementary services, such as CRBT, Call Transfer, Do not Disturb, and so on.
##	After ## is detected, the gateway terminates the process of receiving digits. ## also functions as a special dial string for users to receive gateway IP address and version number of firmware by default.

4.2.3.2 Configure Session Timer Settings

After logging in to the device web GUI, click *Advanced* →*SIP* to configure Session Timer.

Name	Description
Session timer	Choose to activate session refresh (RFC 4028). By default, session timer is not activated. By default, this is not selected.
Session interval	Set the session refresh interval that will be included in the Session-Expires field of INVITE or UPDATE messages. Default value is 1800 seconds.
Minimum timer	Set the minimum value of session refresh interval.

4.2.3.3 Configure DTMF Settings

After logging in to the device web GUI, click *Basic* → *System* to configure DTMF related settings.

Name	Description
DTMF transmission method	Transmission modes of DTMF signal supported by the gateways include RFC 2833, Audio and SIP INFO. The factory default value is RFC 2833. **RFC 2833**: Enable the gateway to send RFC 2833 DTMF. **Audio**: Enable the gateway to send in-band DTMF.

Name	Description
	SIP INFO: Enable the gateway to send SIP INFO messages for DTMF-relay. **RFC2833+SIP INFO**: Enable the gateway to send RFC 2833 DTMF and SIP INFO simultaneously.

4.2.3.4 Configure Line Service Settings

After logging in to the device web GUI, click *Line* → *Feature* to configure services listed in the table.

Name	Description
Call forwarding	Select if Call forwarding is activated on this line. By default, it is not selected.
Unconditional	All incoming calls are forwarded to the telephone number specified in this parameter.
No Answer	All incoming calls are forwarded to the telephone number specified in this parameter when they are not answered.
Busy	All incoming calls are forwarded to the telephone number specified in this parameter when the extension is busy.
Registration subscription	The device subscribes the registration status of the line. If the subscription is successful, the SIP server sends a NOTIFY message for notification of the registration status of the line. Note that this parameter is displayed only when IMS is selected and *Registration subscription* is checked on *Advanced* → *SIP* page.
Call waiting	Select if Call waiting is activated on this line. By default this is not selected.
Call hold	Select it to enable Call Hold on this line. By default this is not selected. Note that if this function is enabled, the gateways will automatically activate Call Transfer.
DND allowance	Select if *Do Not Disturb* is allowed to enable on this line. By default, this is not selected.
Three-way calling	Select if 3-way service is activated, and by default this is not selected.
Subscribe MWI	Select if voice mail service is activated. This is not selected by default.
Color ringback tone	Select to activate CRBT (Color Ring Back Tone), then choose an audio file as ring back tone. There are two.dat files in the G.729 coding format (fring1.dat and fring2.dat) storage in MX for factory default. You can upload .wav files through the Web GUI.

Click *Line* → *Characteristics* to configure service listed in following table.

Name	Description
Music on hold	Choose whether to play the background music while call waiting. This is not selected by default.
Distinctive Alert/Ringing	Set the parameter *Alert-Info n* according to the “Alert-Info” value provided on the SIP server. When the “Alert-info” value of received INVITE message matches with the *Alert-Info n*, ring cadence *n* is activated.
Alert-Info 1	Match with ring cadence 1.
Configure ring patterns for ring cadence 1	Configure ring patterns for ring cadence 1. For example, if the ring patterns are set to 2, 500, 500, 1000, 3000, the ringing cadence is 0.5s on, 0.5s off; 1s on, 3s off. If the ring patterns are

Name	Description
	set to 2000, 4000, the ringing cadence will be 2s on, 4s off.
Alert-Info 2	Match with ring cadence 2.
Configure ring patterns for ring cadence 2.	Configure ring patterns for ring cadence 2. It is used with Alert-Info 2.
Alert-Info 3	Match with ring cadence 3.
Configure ring patterns for ring cadence 3	Configure ring patterns for ring cadence 3
Alert-Info 4	Match with ring cadence 4.
Configure ring patterns for ring cadence 4	Configure ring patterns for ring cadence 4. It is used with Alert-Info 4.

4.1 Subscriber Level Configuration

After login to the device web GUI, Click *Line* → *Configuration* to configure subscriber related settings.

Name	Description
Phone Line	Choose the port number associated with this port.
SIP Account Name	Fill in the SIP account name associated with this port. This parameter needs to match BroadWorks user's Line/Port configuration located on the *user* → *Profile* → *Address* page.
Caller ID Text	This field is optional. It could use the BroadWorks user's *Calling Line ID Last Name* and *Calling Line ID First Name* configuration, or *Last Name* and *First Name* configuration located on the *user* → *Profile* → *Profile* page.
Registration	Select to enable registration of this line with BroadWorks. It is enabled by default.
Auth User Name	User name for SIP authentication. This parameter needs to match BroadWorks user's SIP *Authentication User Name* configurations located on the *user* → *Utilities* → *Authentication* page. This is not mandatory. If this parameter remains blank, the value of SIP Account Name field is used.
Registrar password	Password for SIP authentication. This parameter needs to match BroadWorks user's SIP Authentication Password configuration located on the *user* → *Utilities* → *Authentication* page.

4.2 SIP Feature Configuration

This section provides configuration instructions for SIP features supported by the device such as Advice of Charge, Emergency Call, and Fax.

4.2.1 Emergency Call Configuration

This feature is not supported.

4.2.2 Advice of Charge Configuration

There are no additional New Rock configurations required.

4.2.3 Fax Configuration

This section provides configuration instructions to configure the device to enable fax.

After logging in, click *Basic* → *FoIP* to configure fax related settings.

Name	Description
Initial offer	
Codec	Click **Edit**, go to *Basic* → *System* page to configure.
RTP port Min.	Click **Edit**, go to *Advanced* → *Media stream* page to configure.
RTP port Max.	Click **Edit**, go to *Advanced* → *Media stream* page to configure.
Fax configuration	
Transport mode	The device supports two fax modes: T.38 and G.711 transparent transmission. When fax messages are received or sent through an analog trunk, the G.711 transparent transmission mode is required. When fax messages are received or sent through an IP trunk, a T.38 or a G.711 transparent transmission mode needs to be selected according to an actual requirement and the mode supported by the IP phone operation platform. If both T.38 and G.711 transparent transmission modes are supported, T.38 is recommended because it is more stable.
Allow opposite terminal to switch to T.38	When the device sends a fax message in G.711 transparent transmission mode, if the other party sends a T.38 negotiation request, the device will respond to the request and automatically switch to the T.38 mode.
Adjustable parameters when the T.38 is enabled (Default values are recommended).	
Maximum fax rate	Select the maximum transmission rate of the fax service. 33600bps indicates the highest-rate fax mode.
Port for fax transmission	Set whether to use a new RTP port when the gateway switches to the T.38 mode. The default value is Use original RTP port. Use a new port: Indicates that a new RTP port is used. Use original RTP port:Indicates that the original RTP port established during the call is used.
ECM mode	The error correction mode (ECM) for the fax service. When the Maximum fax rate is 14400, the ECM mode is not used by default. When the Maximum fax rate is 33600, the ECM mode is used by default.
Packet size	Set a data frame packet interval for T.38. The options include 30 ms and 40 ms. The default value is 30 ms.
Signaling redundancy level	Set the number of redundant data frames in T.38 data packets. The value range is 0–6 frames, and the default value is 4 frames.
Image Data Redundancy level	Set the number of redundant images in T.38 data packets. The value range is 0–2, and the default value is 1.

5 Device Management

The New Rock MX Series VoIP Gateway does not currently support the BroadWorks Device Management feature.

Appendix A: Reference MX Series VoIP Gateway Configuration Files

The New Rock MX Series VoIP Gateway does not support configuration files.

References

[1] New Rock Technologies, Inc. 2016. *MX Series VoIP Gateway User Manual, Release 347*. Available from New Rock Technologies at www.newrocktech.com.

[2] BroadSoft, Inc. 2016. *BroadWorks Device Management Configuration Guide*, *Release 21.0*. Available from BroadSoft at xchange.broadsoft.com.

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