

**Subject** Media Relay Gateway Remote SIP Extension Setup

**Bulletin Type** ☐ Product ☐ Marketing ☒ Service

**Bulletin Number** Unified Communications-2017-SB-82

**Date** May 1, 2017

**Product** Unified Communications



The KX-NS1000 and KX-NS700/G systems have a built-in Media Relay Gateway feature providing a simple and easy remote connection for extensions without a Virtual Private Network (VPN) or Session Border Controller (SBC).

## Setup requirements

Please ensure the PBX and Panasonic SIP extensions are running the latest firmware. The latest firmware can be obtained through the dealer support portal.

Firmware	
System	Minimum
KX-NS1000	V4.2xxx ▲
KX-NS700	
KX-NS700G	

Licenses	
Model	Type
KX-UT	SIP-MLT
KX-HDV	P-SIP
KX-TGP/UTG	3rd Party SIP

You will need to ensure there are enough licenses to register phones on the PBX system you are installing. The KX-NS700G will allow a maximum of 4 IP Proprietary telephones to be registered.

## Setup Limitations

The following restrictions apply when setting up the MRG and SIP for remote extensions:

- 3rd Party SIP phone, Media5 or Bria, must support Blank UDP transmit capability.
- TR069 (CWMP) for UT phones is available with https.
- Automatic setup and updates pushed via NS system only available for KX-UT series phones.
- Security Gateway function is not supported.
- Maximum number of phones is dependent on DSP resources.<sup>1</sup>
- No encryption for signaling (SIP) and voice/media (RTP).
- Number of HTTPS sessions is up to 20 for each unit.
- Peer-to-peer function does not work with this setup.<sup>2</sup>
- Built-in router (WAN) function should be disabled.<sup>3</sup>

<sup>1</sup> KX-NS700G is further restricted to 4 IPPT only.

<sup>2</sup> DSP resource will be used.

<sup>3</sup> KX-NS1000 System



## Port Forwarding

The near-end NAT router will need to be configured to allow IP packets to be received from the remote SIP telephones.

### KX-NS1000

Protocol	Range of Ports	Destination (DSP)	Description
RTP	16000–16511 (UDP)	192.168.0.102	Send RTP to <b>DSP#1-1</b>
	16512–17023 (UDP)	192.168.0.103	Send RTP to <b>DSP#1-2</b>
	17024–17535 (UDP)	192.168.0.104	Send RTP to <b>DSP#2-1</b>
	17536–18047 (UDP)	192.168.0.105	Send RTP to <b>DSP#2-2</b>

KX-NS1000 will have 4 DSP-IP Addresses when (2) DSP-L cards are installed.

### KX-NS700/G

Protocol	Range of Ports	Destination (DSP)	Description
RTP	16000–16511 (UDP)	192.168.0.102	Send RTP to <b>DSP#1-1</b>
	16512–17023 (UDP)	192.168.0.103	Send RTP to <b>DSP#1-2</b>

KX-NS700/G will have 2 DSP-IP Addresses when a DSP-L cards are installed.

### SIP Data Ports

Protocol	Range of Ports	Destination (PBX IP Address)	Description
SIP	0 (UDP) → 5060 (UDP)	192.168.0.101	Send SIP to <b>PBX IP</b>
CWMP (HTTP)	7547 (TCP)	192.168.0.101	Send CWMP to <b>PBX IP</b>
CWMP (HTTPS)	37547 (TCP)	192.168.0.101	Send CWMP to <b>PBX IP</b>
SIP-MLT Data Download (HTTP)	7580 (TCP)	192.168.0.101	Send Data to <b>PBX IP</b>
SIP-MLT Data Download (HTTPS)	37580 (TCP)	192.168.0.101	Send Data to <b>PBX IP</b>
NTP	123 (UDP)	192.168.0.101	Send NTP to <b>PBX IP</b>

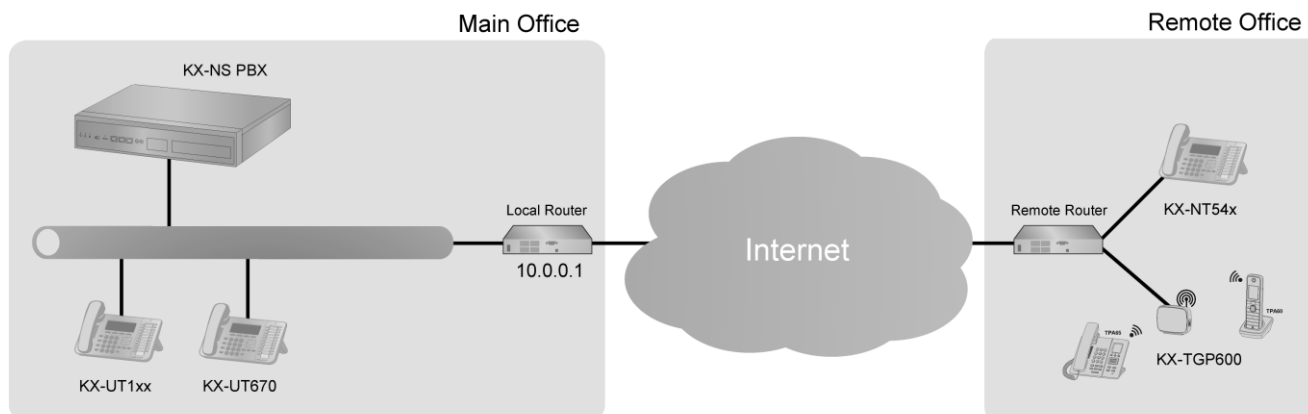
**SIP Protocol needs port number conversion to 5060 from the dealer assigned port (p.4).**

### NS Upgrade Push over MRG

Protocol	Range of Ports	Destination (PBX IP Address)	Description
FTP	31021 (TCP)	192.168.0.101	Send NAT FTP to <b>PBX IP</b>
	40000–40095 (TCP)	192.168.0.101	Send FTP/FTPS-Data to <b>PBX IP</b>



## Network Diagram Example



### Disclaimer

The PBX needs to be behind a firewall and assigned a private IP address. Use of a public IP address using MRG is at the sole responsibility of the installing dealer. Panasonic is not liable for any security breaches if a public IP address is used. There for Panasonic strongly recommends a private static IP behind a firewall is used.

## Port Configuration

[PBX Configuration] → [1.Configuration] → [1.Slot] IP Port Number Settings  
[Site Property] → [Main] → Port Number

**Site Property - Main**

HERE

« Main VoIP-DSP Options VoIP-DSP Options 2 **Port Number** LAN Status Media Relay SIP

Voice (RTP) UDP Port No. (Server) : 12000

Voice (RTP) UDP Port No. (IP-PT / SIP-MLT) : 8000

UDP Port No. for SIP Extension Server : 5060

CWMP (HTTP) Port No. for SIP-MLT : 7547

CWMP (HTTPS) Port No. for SIP-MLT : 37547

Data Transmission Protocol (HTTP) Port No. for SIP-MLT : 7580

Data Transmission Protocol (HTTPS) Port No. for SIP-MLT : 37580

Default Values

Configure Start RTP port number for NAT (Common setting with SIP Trunk)  
[Virtual] → [V-SIPGW16] → [Card Property] → [Common Settings]

**Shelf Property - Virtual SIP Gateway**

Main Timer

SIP Client Port Number : 35060

NAT Traversal : Off

NAT - Voice (RTP) UDP Port No. : 16000 **Default Value**

NAT - Keep Alive Packet Sending Ability : Disable

## Media Relay Configuration

Configure IP port number setting for Remote SIP Extension  
[Site Property] → [Main] → [Media relay] → Edit NAT & SIP Extension parameters → Click [Apply] → Click [OK]

**Site Property - Main**

« Main VoIP-DSP Options VoIP-DSP Options 2 Port Number LAN Status **Media Relay** SIP Extension »

**Common**

NAT - External IP Address : 10.0.0.1

**IP Extension**

NAT - MGCP Server Port No. : 2727

Keep Alive Packet Type : Blank UDP

Keep Alive Packet Sending Interval Time (s) : 20

**SIP Extension / UT Extension**

NAT - SIP Proxy Server Port No. : 0

**Default is 0.**

You will need to specify a port number of your choosing between 1—65535.

You cannot use x50xx, 50xx, or any other port already assigned to another service.

This change was made for security purposes.

**Site Property - Main**

« Main VoIP-DSP Options VoIP-DSP Options 2 Port Number LAN Status **Media Relay** SIP Extension »

**UT Extension**

NAT - CWMP Server (HTTP) Port No.	: 7547
NAT - CWMP Server (HTTPS) Port No.	: 37547
NAT - CWMP Server (HTTP) Port No. for Network Survivability	: 7547
NAT - CWMP Server (HTTPS) Port No. for Network Survivability	: 37547
NAT - SIP-MLT Data Download Server (HTTP) Port No.	: 7580
NAT - SIP-MLT Data Download Server (HTTPS) Port No.	: 37580
NAT - NTP Server Port No.	: 123
Keep Alive Packet Type	: Blank UDP
Keep Alive Packet Sending Interval Time (s)	: 20
SIP Register Expire Time (s)	: 20
PERIODIC Ability	: Enable
PERIODIC Packet Sending Interval Time (s)	: 30

**Default Values**

The following parameters must be blank as the "NAT-External IP address" is applied for each parameter. In the case that the WAN IP address is different by protocol, a value must be entered in these fields.

**Site Property - Main**

« Main VoIP-DSP Options VoIP-DSP Options 2 Port Number LAN Status **Media Relay** SIP Extension »

**Option**

NAT - RTP IP Address	:
NAT - SIP Proxy Server IP Address	:
NAT - CWMP Server IP Address	:
NAT - CWMP Server IP Address for Network Survivability	:
NAT - NTP Server IP Address	:

**Must Be BLANK**

**Site Property - Main**

« Main VoIP-DSP Options VoIP-DSP Options 2 Port Number LAN Status **Media Relay** SIP Extension »

**Common**

NAT - External IP Address	: 10.0.0.1
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## Extension Registration

All SIP extensions must complete their registration before they can be

Model	Virtual Card	License Type	Licenses Number	Registration Type
KX-UTxxx <sup>2</sup>	V-UTEXT32	SIP-MLT	KX-NSM2xx, KX-NSM5xx	Automatic/Manual
KX-HDV	V-SIPEXT32	P-SIP	KX-NSM2xx, KX-NSM5xx	Manual Only
KX-TGP600 <sup>1</sup>	V-SIPEXT32	P-SIP	KX-NSM2xx, KX-NSM5xx	Manual Only
KX-NTV	V-SIPEXT32	P-SIP	KX-NSM2xx, KX-NSM5xx	Manual Only
KX-UTGxxx	V-SIPEXT32	3 <sup>rd</sup> Party	KX-NSM7xx	Manual Only
Other SIP	V-SIPEXT32	3 <sup>rd</sup> Party	KX-NSM7xx	Manual Only

<sup>1</sup> When using a KX-TGP600, depending on the registration status of the wireless handsets, up to 8 activation keys for P-SIP may be required.

<sup>2</sup> Updates are available while remote for the KX-UT series. All other units must be updated manually.

1. Install the appropriate **license** for the phone type.
2. Install the appropriate **virtual extension card** based on the phone type.

### IP Terminal Registration Mode

☐ Manual
 ☒ Full Automatic
 ☐ Extension Input

3. KX-UT extensions will automatically register to their card when they are in a factory default state and they are on the same network.
4. All other SIP extensions require manual programming for both the card and the telephone interface.
  - a. Card Requirement
    - Extension Number Set
    - Password Assigned to Extension Number
  - b. Panasonic Phone Requirement:
    - Extension Number (Set on Card)
    - Registrar (PBX IP)
    - Proxy (PBX IP)
    - Service Domain (PBX IP)
    - Authentication ID (Extension Number)
    - Authentication Password (Set on Card)



This is the minimum basic requirements to program the terminal. Refer to telephone manual for further information on how to access for programming.

**Once the phone is registered to the system, you can move forward with setting remote options on card.**





## KX-UT Remote Status Setting

[Virtual] → [V-UTEXT32] → [Port Property] → [Remote Place] → [Edit] →

Select [Remote MRG] in the [Phone Location] for UT Phone that will be used at the remote site.

Select [HTTPs] in the [Protocol for Remote SIP-MLT] column. [Apply] → [OK]

**Port Property - Virtual UT Extension**

Registration De-registration Forced De-registration HERE SIP-CS Web

Main Option Secondary Setting Remote Place HERE

Extension Number	Extension Name	Connection	Phone Location	Web-MC Ability	Protocol for Remote SIP-MLT
101		OUS	Remote (MRG)	Enable	HTTPs
102		OUS	Local	Enable	HTTP

**Reboot the UT Phone by power reset or manually RESET by using command line in the phone.**

The "Remote Extension configurations" set above are downloaded and written in to the KX-UT phone. After downloading and writing the configuration, the following is displayed on the UT-SIP Phone.

**Panasonic** KX-UT123

Connection error (90002)  
Check server and set it.

## SIP 3<sup>rd</sup> Party Remote Status Setting

Virtual] → [V-SIPEXT32] → [Port Property] → [Remote Place] → [Edit]

Select [Remote MRG] in the [Phone Location] for the SIP Phone that will be used at the remote site.

[Apply] → [OK]

**Port Property - Virtual SIP Extension**

Copy to HERE

Main Option Remote Place FAX/T.38 HERE

No.	Site	Shelf	Slot	Port	Extension Number	Password	Connection	Phone Location
1	1	Virtual	48	1	133		OUS	Remote (MRG)
2	1	Virtual	48	2	134		OUS	Local

