

# Media Relay Gateway (MRG) - Step by Step -

**Rev 2.5 NOV. 2020**



# Contents for MRG Step by Step

Item	Contents
1	MRG Overview
2	Network Requirements
3	Router/Firewall Programming
4	PBX Programming
5	IP Device Configuration
6	Additional - FQDN
7	Appendix

# Media Relay Gateway (MRG)

With supported IP device types, users can be connected over the internet without a VPN service, using port forwarding at the HQ router/firewall.



## Supported PBX Models:

- NS500/700/1000
- NSX1000/2000
- NSV300

## With FQDN Support

- NT630/680
- IP Softphone (for PC)
- UCMA Mobile Softphone
- Communication Assistant

## With Signalling Encryption (TLS)

- NT630/680
- HDV Series
- TGP600
- IP Softphone (for PC)
- UCMA Mobile Softphone
- Communication Assistant

## With Speech Encryption (SRTP)

- NT630/680
- IP Softphone (for PC)

## Supported Extension Types

- NT5xx/6xx
- IP Softphone (for PC)
- HDV Series
- TGP600
- UCMA Mobile Softphone
- NS0154 IP DECT

MRG extensions do not require any additional AKs – activate the same as for local IP devices.

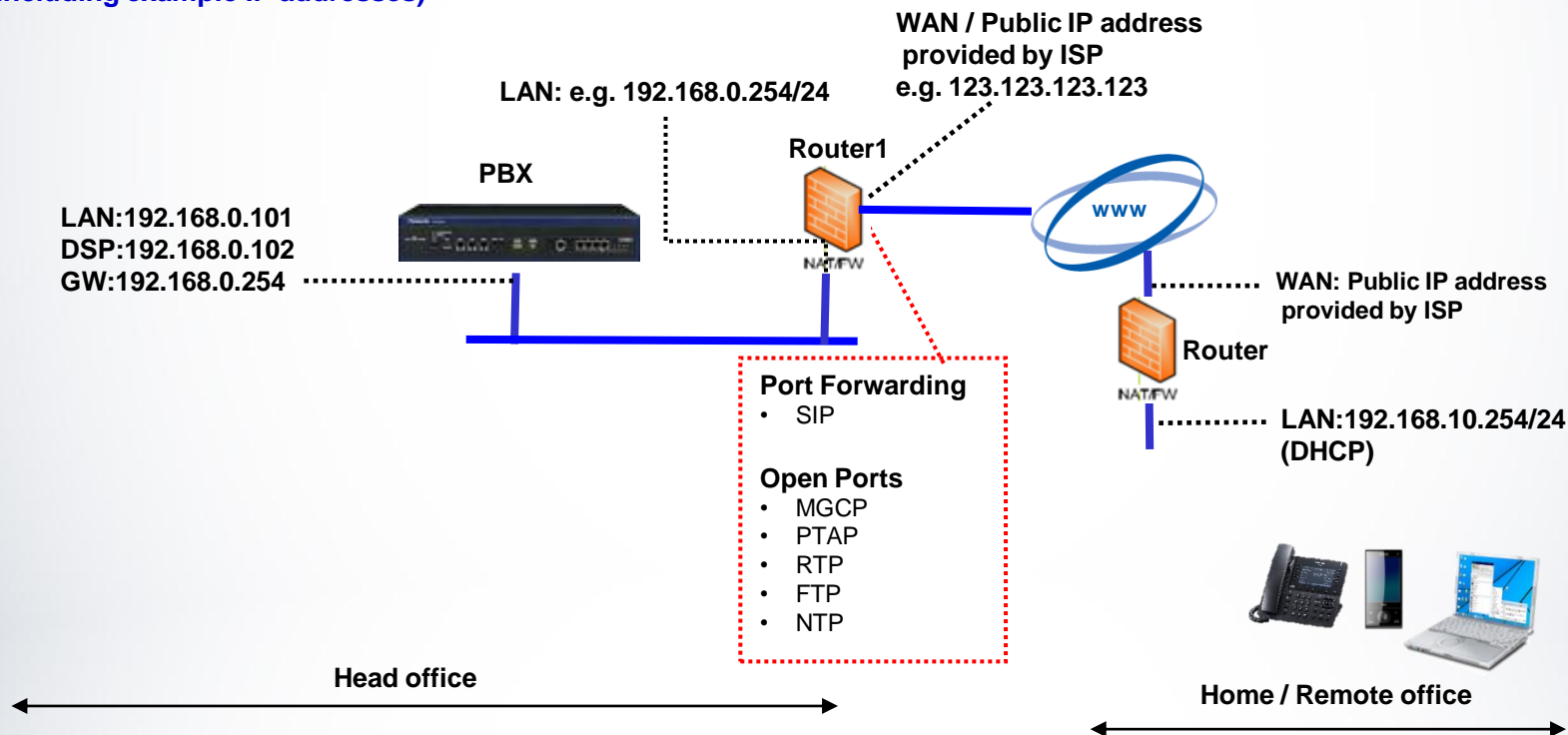
**NOTE:** P2P voice is not possible for MRG extensions so DSP card capacity is more heavily consumed.

An abstract background image featuring a dark blue and black color palette with glowing green and yellow light points and thin, intersecting white lines, suggesting a complex network or data flow.

# Network Requirements

## Example Diagram of typical system configuration

(including example IP addresses)





# Mobile Softphone Network Requirements

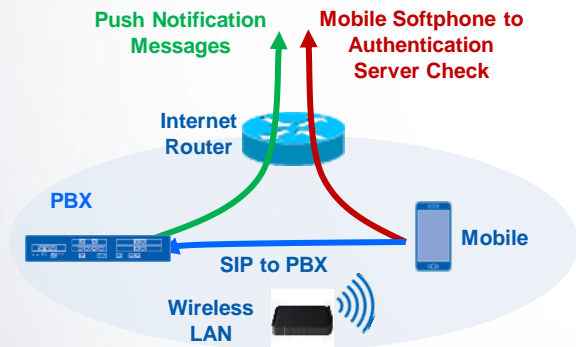
UCMA Mobile Softphone has additional networking capability and can be configured to connect:

Locally (e.g. office wireless LAN) or

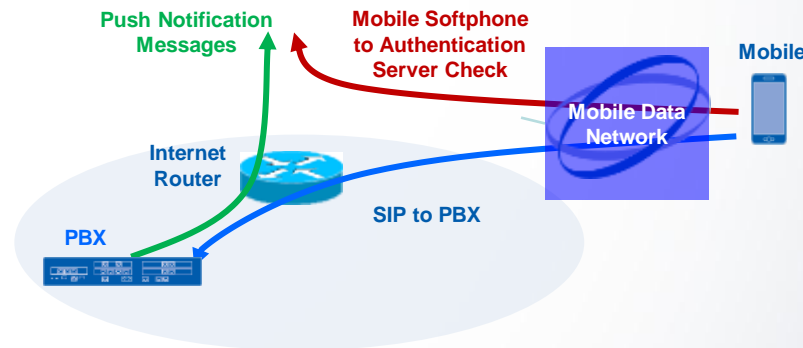
Remotely (over internet e.g. public Wifi hotspot or Mobile Data network).

**In either configuration, Mobile Softphone must have access to both PBX and Panasonic Authentication Server and must use the same network connection for both.**

(Not possible to use Wireless LAN for the PBX connection and Mobile Data for the Authentication Server connection).



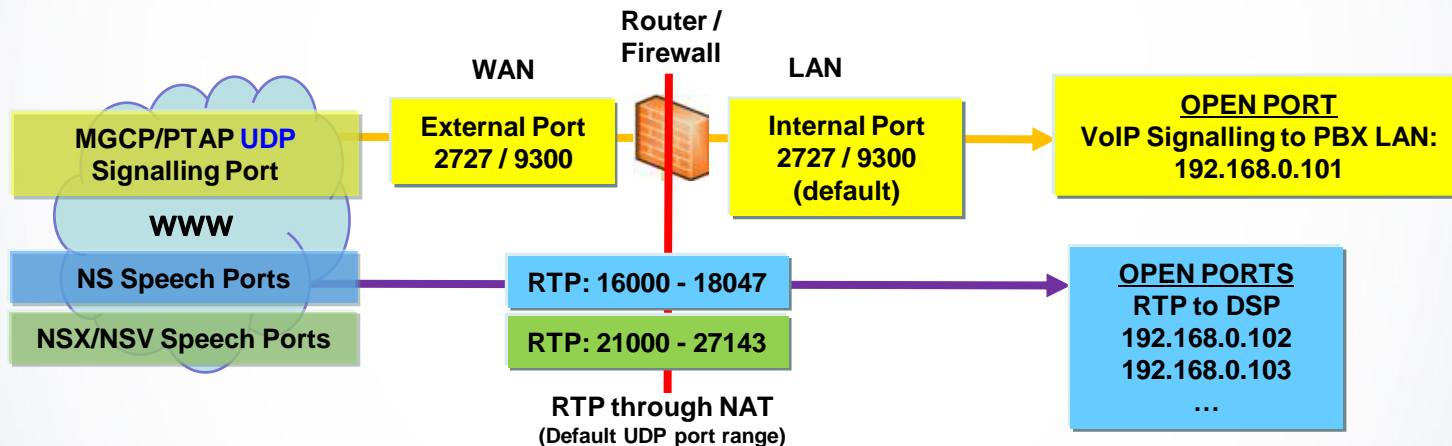
Local Network Access



Remote Network Access

For Push Notification, the PBX must also have internet access and valid DNS configured.

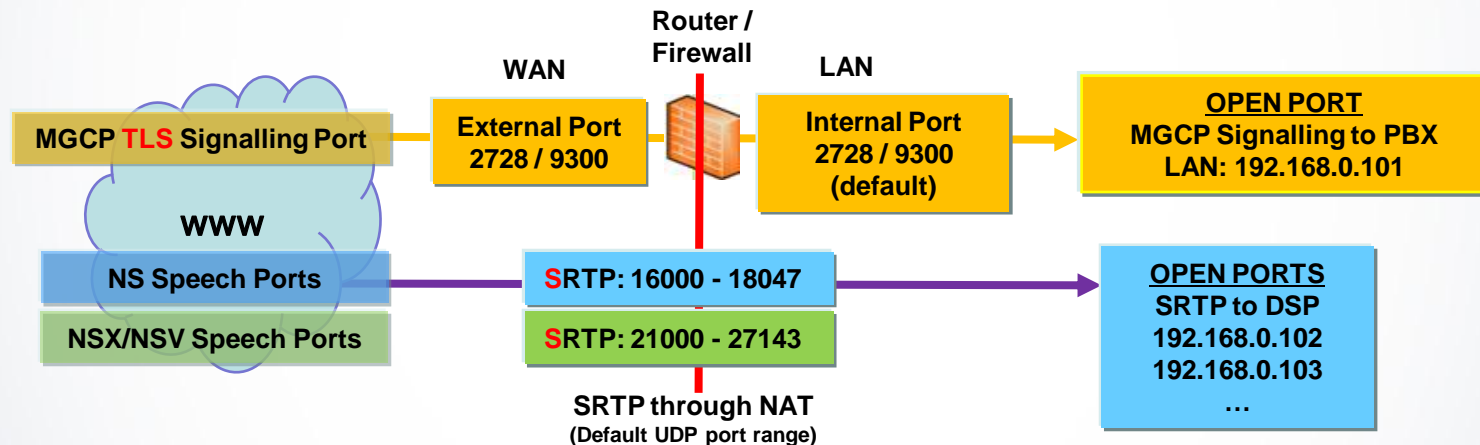
Internet router/firewall must be configured for **Open Port** communication for NT5/NT6/IP Softphone (for PC) signalling data and **Open Ports** for the RTP/SRTP VoIP conversation data.  
(SRTP only support with NT630/680)



Protocol	Port numbers	Destination	Description
MGCP	2727 (UDP)	192.168.0.101	Send MGCP to <b>PBX LAN</b> IP Address
PTAP	9300 (UDP)	192.168.0.101	Send PTAP to <b>PBX LAN</b> IP Address
RTP	PBX Model dependent (UDP)	192.168.0.102 etc	Send RTP to <b>DSP</b> IP Address

All Port numbers referred to in the following guidance can be changed.  
The examples shown are either sample port numbers or default values.

MGCP-TLS is **highly recommended** for additional security. The same **Open Port** process is used but with a different MGCP signalling port number for TLS. RTP stream is also encrypted as SRTP data. (UDP Port range for **SRTP** Speech packets **does not change** when using MGCP-TLS).

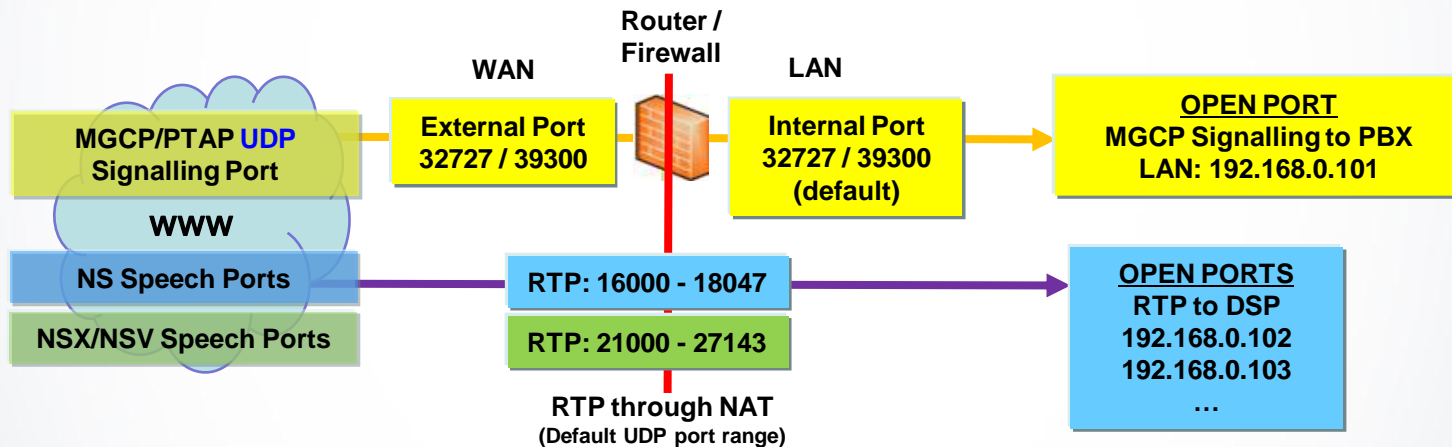


Protocol	Port numbers	Destination	Description
MGCP-TLS	2728 (TCP)	192.168.0.101	Send MGCP to <b>PBX LAN</b> IP Address
PTAP	9300 (UDP)	192.168.0.101	Send PTAP to <b>PBX LAN</b> IP Address
SRTP	PBX Model dependent (UDP)	192.168.0.102 etc	Send SRTP to <b>DSP</b> IP Address

All Port numbers referred to in the following guidance can be changed.  
The examples shown are either sample port numbers or default values.



Internet router/firewall must be configured for **Open Ports** communication for NS0154 signalling data and **Open Ports** for the RTP VoIP conversation data.



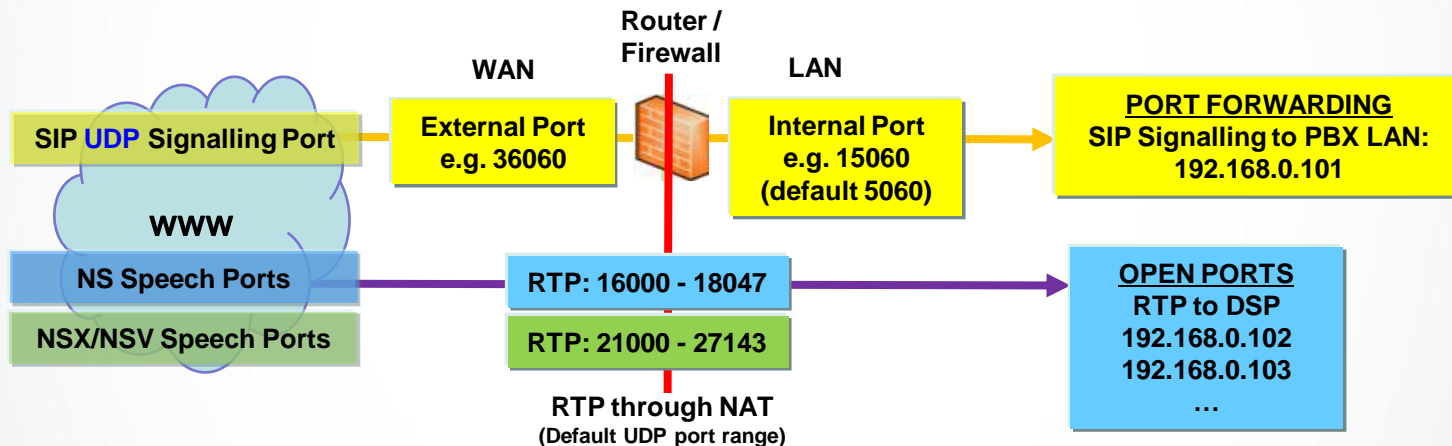
Protocol	Port numbers	Destination	Description
MGCP	32727 (UDP)	192.168.0.101	Send MGCP to <b>PBX LAN</b> IP Address
PTAP	39300 (UDP)	192.168.0.101	Send PTAP to <b>PBX LAN</b> IP Address
RTP	PBX Model dependent (UDP)	192.168.0.102 etc	Send RTP to <b>DSP</b> IP Address

All Port numbers referred to in the following guidance can be changed.  
The examples shown are either sample port numbers or default values.

# Basic UDP Port Settings – SIP

Internet router/firewall must be configured for **Port Forwarding** of the communication ports for SIP Extensions and **Open Ports** for the RTP VoIP conversation.

**NOTE: It is highly recommended to only use SIP-TLS for remote SIP devices whenever possible.**

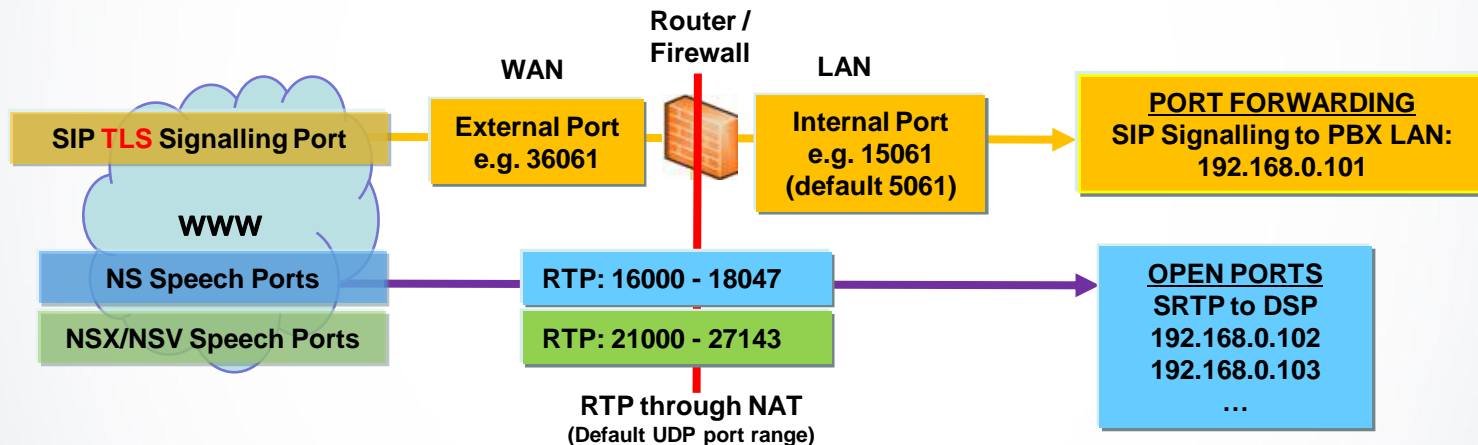


Protocol	Port numbers	Destination	Description
SIP	e.g. 15060 (UDP)	192.168.0.101	Send SIP to PBX LAN IP Address
RTP	PBX Model dependent (UDP)	192.168.0.102 etc	Send RTP to DSP IP Address

All Port numbers referred to in the following guidance can be changed. The examples shown are either sample port numbers or default values.

**NOTE: It is highly recommended to use ambiguous External port numbers where possible to, reduce the chances of hacking attempts reaching the PBX – e.g. avoid ports ending xxx60, xxx61 etc.**

SIP-TLS is **highly recommended** for additional security. The same **Port Forwarding** process is used but with a different SIP signalling port number for TLS. RTP Speech packets **do not change** when using SIP-TLS).

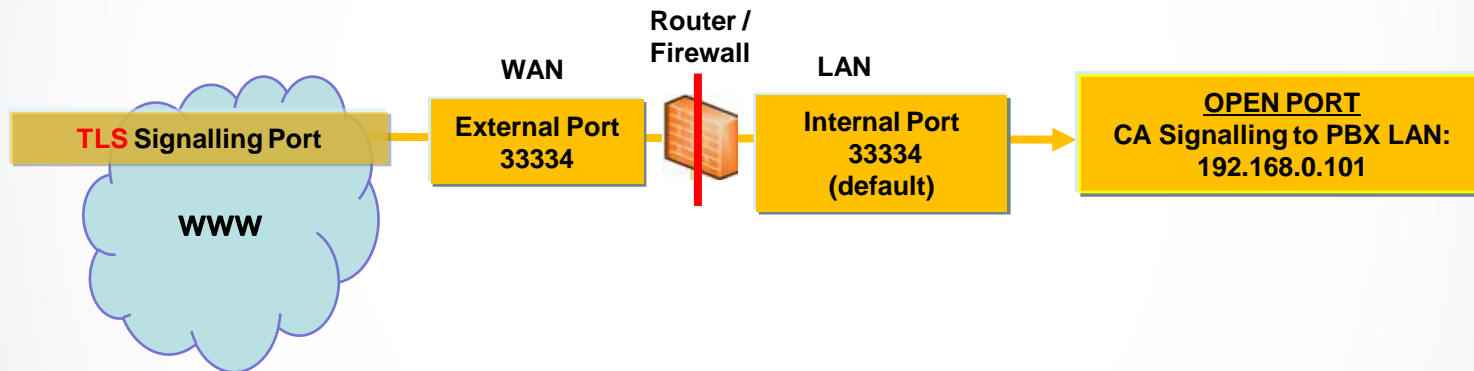


Protocol	Port numbers	Destination	Description
SIP-TLS	e.g. 15061 (TCP)	192.168.0.101	Send MGCP to <b>PBX LAN</b> IP Address
RTP	PBX Model dependent (UDP)	192.168.0.102 etc	Send RTP to <b>DSP</b> IP Address

All Port numbers referred to in the following guidance can be changed. The examples shown are either sample port numbers or default values.

**NOTE:** It is highly recommended to use ambiguous External port numbers where possible to , reduce the chances of hacking attempts reaching the PBX – e.g. avoid ports ending xxx60, xxx61 etc.

TLS for CA is **highly recommended** for additional security. The **Open Port** process is used.



Protocol	Port numbers	Destination	Description
TLS for CA	33334 (TCP)	192.168.0.101	Send CA signaling to PBX LAN IP Address

Port numbers referred to in the following guidance can be changed.  
The examples shown are either sample port numbers or default values.



# Router/Firewall Detailed Programming

## For NT5/NT6 Series and IP Softphone (for PC)

Configure the following using **Open Ports** (not Port Forwarding) directed to the **PBX LAN IP Address**

Function	Protocol	Start Port	End Port	Target IP	Description
PTAP	UDP	9300	9300	192.168.0.101	Device Registration
MGCP	UDP	2727	2727	192.168.0.101	Signalling
MGCP-TLS*	TCP	2728	2728	192.168.0.101	Encrypted Signalling
FTP/FTPS	TCP	31021	31021	192.168.0.101	NT Firmware Update signalling
FTP/FTPS	TCP	40000	40095	192.168.0.101	NT Firmware Data (for NS)
FTP/FTPS	TCP	40000	40149	192.168.0.101	NT Firmware Data (for NSX/NSV)
NTP	UDP	123	123	192.168.0.101	Time Server

**All Port numbers referred to can be changed.**  
**The examples shown are either sample port numbers or default values.**

\* **MGCP-TLS is not available for NT5 Series**



## For NS0154 IP DECT

Configure the following using **Open Ports** (not Port Forwarding) directed to the **PBX LAN** IP Address

Function	Protocol	Start Port	End Port	Target IP	Description
PTAP	UDP	39300	39300	192.168.0.101	Device Registration
MGCP	UDP	32727	32727	192.168.0.101	Signalling
FTP/FTPS	TCP	31021	31021	192.168.0.101	Firmware Update signalling
FTP/FTPS	TCP	40000	40095	192.168.0.101	CS Firmware Data (for NS)
FTP/FTPS	TCP	40000	40149	192.168.0.101	CS Firmware Data (for NSX/NSV)
NTP	UDP	123	123	192.168.0.101	Time Server

**All Port numbers referred to can be changed.**  
**The examples shown are either sample port numbers or default values.**

**For SIP: HDV / TGP600 / Mobile Softphone**

Configure the following using **Port Forwarding** (not Open Ports) directed to the **PBX LAN** IP Address.

**MRG mechanism relies on Port Forwarding: External and Internal port numbers must be different.  
Using Open Ports instead will not work.**

Function	Protocol	External Port	Internal Port	Target IP	Description
SIP	UDP	36060	15060	192.168.0.101	Registration and Signalling
SIP-TLS	TCP	36061	15061	192.168.0.101	Registration and Signalling
NTP	UDP	123	123	192.168.0.101	Time Server

**All Port numbers referred to can be changed.**

**The examples shown are either sample port numbers or default values.**

**NOTE: It is highly recommended to use ambiguous External port numbers where possible to , reduce the chances of hacking attempts reaching the PBX – e.g. avoid ports ending xxx60, xxx61 etc.**

## For all IP Devices – NS Series

Configure the following using **Open Ports** (not Port Forwarding) directed to the **DSP** IP Address

NS500/700	DSP Card	Start Port	End Port
DSP Slot 1	Card #1 IP address 1	16000	16511
DSP Slot 1 – Large DSP	Card #1 IP address 2	16512	17023

**DSP-S and DSP-M have  
1 IP Address.**

NS1000	DSP Card	Start Port	End Port
DSP Slot 1	Card #1 IP address 1	16000	16511
DSP Slot 1 – Large DSP	Card #1 IP address 2	16512	17023
DSP Slot 2	Card #2 IP address 1	17024	17535
DSP Slot 2 – Large DSP	Card #2 IP address 2	17536	18047

**DSP-L has 2 IP  
Addresses**

Each DSP IP address is allocated a range of 512 ports for RTP/SRTP traffic.

The UDP Port range used by RTP/SRTP through NAT to each DSP card is controlled by the **V-SIPGW Shelf Properties** (trunks) not the SIP-EXT Shelf.

\* SRTP available for NT630/680/IP Softphone (for PC) only when using MGCP-TLS (same port number range is used)

## For all IP Devices – NSX Series

Configure the following using **Open Ports** (not Port Forwarding) directed to the **DSP** IP Address

NSX 1000/2000	DSP Card	Start Port	End Port
Standalone / Primary	Card #1 IP address 1	21000	21511
	Card #1 IP address 2	21512	22023
	Card #2 IP address 1	22024	22535
	Card #2 IP address 2	22536	23047
	Card #3 IP address 1	23048	23559
	Card #3 IP address 2	23560	24071
Hot-Standby Secondary	Card #1 IP address 1	24072	24583
	Card #1 IP address 2	24584	25095
	Card #2 IP address 1	25096	25607
	Card #2 IP address 2	25608	26119
	Card #3 IP address 1	26120	26631
	Card #3 IP address 2	26632	27143

**DSP-S and DSP-M have 1 IP Address.**

**DSP-L has 2 IP Addresses**

Each DSP IP address is allocated a range of 512 ports for RTP/SRTP traffic.

The UDP Port range used by RTP/SRTP through NAT to each DSP card is controlled by the **V-SIPGW Shelf Properties** (trunks) not the SIP-EXT Shelf.

\* SRTP available for NT630/680/IP Softphone (for PC) only when using MGCP-TLS (same port number range is used)

## For all IP Devices – NSV300

Configure the following using **Open Ports** (not Port Forwarding) directed to **NSV LAN / Software DSP** IP Address

NSV300	DSP Card	Start Port	End Port
Software DSP	NSV LAN IP address	21000	21511

**NSV Software DSP  
has 1 IP Address**

The NSV Software DSP is allocated a range of 512 ports for RTP/SRTP traffic.

The UDP Port range used by RTP/SRTP through NAT to the NSV Software DSP is controlled by the V-SIPGW Shelf Properties (trunks) not the SIP-EXT Shelf.

\* SRTP available for NT630/680/IP Softphone (for PC) only when using MGCP-TLS – same port number range is used

## For Communication Assistant (CA)

Configure the following using **Open Ports** (not Port Forwarding) directed to the **PBX LAN** IP Address

Function	Protocol	Start Port	End Port	Target IP	Description
TLS for CA	TCP	33334	33334	192.168.0.101	Encrypted Signalling

Port numbers referred to can be changed.

The examples shown are either sample port numbers or default values.





# PBX Programming

**PBX IP Address programming must be correctly configured for internet access and match the router/firewall programming.**

**Basic Settings** | Advanced Settings | Reference

**IP Address** **PBX LAN** 192.168.0.101

MAC Address : 08:00:23:6B:70:43

Subnet Mask : 255.255.255.0

Default Gateway : 192.168.0.1

---

**DNS Setting**

Port Number : 53

☐ Obtain DNS server address automatically

☒ Use the following DNS server address

Preferred DNS IP Address : 192.168.0.1

Alternative DNS IP Address : 8.8.8.8

---

**DSP IP Setting**

☐ Obtain DSP IP address automatically

☒ Use the following DSP IP address

**DSP Card - 1**

**DSP** IP Address : 192.168.0.102

MAC Address : 08:00:23:6B:70:44

**Mobile Softphone Push notification requires a valid DNS server.**

**For MRG, the PBX must be programmed with the real public IP address of the internet router/firewall.**

**System Property > Site > Media Relay > NAT-External IP Address**  
e.g. 123.123.123.123 (enter real site IP address)

**System Property - Site**

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

**Common**

NAT - External IP Address : 123.123.123.123

**IP Extension / IP-CS**

NAT - MGCP Server Port No. : 2727

NAT - MGCP Server Port No. for IP-CS : 32727

Keep Alive Packet Type : Blank UDP

Keep Alive Packet Type for IP-CS : Blank UDP

Keep Alive Packet Sending Interval Time (s) : 20

NAT - FTP Server Port No. : 31021

**Restart to apply changes**

PBX Port programming for both Internal and External port numbers must be configured to match the router/firewall programming.

**Site Property - Main**

Main VoIP-DSP Options VoIP-DSP Options 2 **Port Number** LAN Status Media Relay SIP Extension Echo Cancellation

Voice (RTP) UDP Port No. (Server)	:	12000
Voice (RTP) UDP Port No. (IP-PT / SIP-MLT)	:	8000
UDP Port No. for SIP Extension Server	:	15060
TLS Port No. for SIP Extension Server	:	15061
Signalling (PTAP) UDP Port No. (Server)	:	9300
Signalling (MGCP) UDP Port No. (Server)	:	2727
Signalling (MGCP) TLS Port No. (Server)	:	2728
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
Firmware Update Port No. for IP-PT/PT-IP-CS (Media Relay)	:	31021

**Internal Port** 9300  
**Internal Port** 2727  
**Internal Port** 2728  
**Internal Port** 31021

**System Property - Site**

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

**Common**

NAT - External IP Address : 123.123.123.123

**IP Extension / IP-CS**

NAT - MGCP Server Port No. **External Port** 2727

NAT - MGCP Server Port No. for IP-CS : 32727

Keep Alive Packet Type : Blank UDP

Keep Alive Packet Type for IP-CS : Blank UDP

Keep Alive Packet Sending Interval Time (s) : 20

NAT - FTP Server Port No. **External Port** 31021

**Network Service**

1. IP Address/Ports

2. Server Feature

1. DHCP (LAN)

**3. FTP**

5. HTTP

6. NTP

7. SMTP

**FTP**

**Connection Control**

Control Port number : 30021

**Data Transfer Port**

Port number (Minimum) **Port Range** 40000

Port number (Maximum) 40149

Default / Example port numbers displayed

Restart to apply changes

Set the IP-PT Extension Ports > Location > Phone Location to **Remote + Local** for all remote extension devices.

Set MGCP-TLS/SRTP to **Enable** for encrypted communication if required (NT630/680 & IP Softphone for PC only).

**Port Property - Virtual IP Extension**

Registration De-registration Forced De-registration

Main Option Voice Secondary Setting **Location / P2P** NT Local Settings

	IP-PT Type	Shelf	Slot	Port	Connection	Phone Location	MGCP-TLS / SRTP	P2P Group
		ALL			ALL	ALL	ALL	ALL
	-	Virtual	17	1	OUS	Remote + Local	Enable (Remote only)	-
	-	Virtual	17	2	OUS	Local only	Disable	1
	-	Virtual	17	3	OUS	Local only	Disable	1

PBX Port programming for both Internal and External port numbers must be configured to match the router/firewall programming.

**Card Property - Virtual IPCS**

Site : 1 Shelf : Virtual Slot : 15

**Common Settings**

Signalling (PTAP) UDP Port No. (Server) **Internal Port** : 39300

Signalling (MGCP) UDP Port No. (Server) **Internal Port** : 32727

Signalling (MGCP) UDP Port No. (IP-CS) : 2427

Voice (RTP) UDP Port No. (IP-CS) : 8000

Keep Alive Time-Out : 20 s

First Resending Time (PTAP) : 500 ms

Resending Time-Out (PTAP) : 150 s

Default / Example port numbers displayed

**Restart to apply changes**

**System Property - Site**

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

**Common**

NAT - External IP Address : 123.123.123.123

**IP Extension / IP-CS**

NAT - MGCP Server Port No. : 2727

NAT - MGCP Server Port No. for IP-CS **External Port** : 32727

Keep Alive Packet Type : Blank UDP

Keep Alive Packet Type for IP-CS : Blank UDP

Keep Alive Packet Sending Interval Time (s) : 20

NAT - FTP Server Port No. **External Port** : 31021

**Network Service**

**FTP**

**Connection Control**

Control Port number : 30021

**Data Transfer Port**

Port number (Minimum) **Port Range** : 40000

Port number (Maximum) : 40149

Set the IP-CS Ports > Remote Place > Phone Location to **Remote(MRG)** for all remote NS0154.

**Port Property - Virtual IPCS**

Registration De-registration Forced De-registration

Main Option Secondary Setting **Remote Place**

No.	Shelf	Slot	Port	CS Name (20 characters)	Connection	Phone Location
	ALL				ALL	ALL
1	Virtual	37	1		OUS	<b>Remote(MRG)</b>
2	Virtual	37	2		OUS	Local
3	Virtual	37	3		OUS	Local

NS0154 must always be configured within either an Air sync or LAN sync group.

To deploy multiple NS0154 units in multiple locations, configure each IP-CS port into different sync groups:

**Main** Option Remote Place

No.	Shelf	Slot	Port	Program Ver.	Air Sync Group No.	LAN Sync Group No.
	ALL				ALL	ALL
1	Virtual	26	1	000.000	None	1
2	Virtual	26	2		None	2
3	Virtual	26	3		None	3
4	Virtual	26	4		None	4
5	Virtual	26	5		None	1



It is also possible to use the Master CS2-1 and CS2-2 settings in each LAN sync group to achieve additional remote location capacity:

**LAN Synchronisation**

CS Status Monitor Delete Add Sort

LAN Synchronisation Group Number: 1

IP Address for Group Control: 1

Index	Site	Shelf	Slot	Port	CS Name (20 characters)	Status	CS Class	MAC Address
1	1	Virtual	26	1	OUS	Registered	Sync Master CS1	00:23:BD:D0
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								

Page 1 of 1 100 View 1 - 64 of 64

OK Cancel Apply

PBX Port programming for both Internal and External port numbers must be configured to match the router/firewall programming.

**Site Property - Main**

Main VoIP-DSP Options VoIP-DSP Options 2 **Port Number** LAN Status Media Relay SIP Extension Echo Cancellation

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

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

UDP Port No. for SIP Extension Server : **15060** **Internal Port**

TLS Port No. for SIP Extension Server : **15061** **Internal Port**

Signalling (PTAP) UDP Port No. (Server) : 9300

Signalling (MGCP) UDP Port No. (Server) : 2727

Signalling (MGCP) TLS Port No. (Server) : 2728

Default / Example port numbers displayed

**Restart to apply changes**

**System Property - Site**

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

**Common**

NAT - External IP Address : 123.123.123.123

**IP Extension / IP-CS**

NAT - MGCP Server Port No. : 2727

NAT - MGCP Server Port No. for IP-CS : 32727

Keep Alive Packet Type : Blank UDP

Keep Alive Packet Type for IP-CS : Blank UDP

Keep Alive Packet Sending Interval Time (s) : 20

NAT - FTP Server Port No. : 31021

**SIP Extension / UT Extension**

NAT - SIP Proxy Server Port No. : **36060** **External Port**

NAT - SIP TLS Server Port No. : **36061** **External Port**

All Port numbers referred to in the following guidance can be changed. The examples shown are either sample port numbers or default values.

**NOTE:** It is highly recommended to use ambiguous External port numbers where possible to , reduce the chances of hacking attempts reaching the PBX – e.g. avoid ports ending xxx60, xxx61 etc.

Set the SIP Extension Ports > Location > Phone Location to **Remote + Local** for all remote extension devices.

A complex Password is recommended for SIP extension ports but greater security can be applied by configuring “Panasonic SIP Phone only” option to **Enable** for HDV / TGP600 / Mobile Softphone.

**Port Property - Virtual SIP Extension**

Copy to Forced De-registration

Main Option **Location / P2P** FAX/T.38

No.	Site	Shelf	Slot	Port	Password	Connection	Phone Location	Panasonic SIP Phone only	P2P G
		ALL			ALL	ALL	ALL	ALL	ALL
1	1	Virtual	6	1	Edit	OUS	Remote + Local	Yes (Only)	-
2	1	Virtual	6	2	Edit	OUS	Local only	No	1
3	1	Virtual	6	3	Edit	OUS	Local only	No	1
4	1	Virtual	6	4	Edit	OUS	Local only	No	1
5	1	Virtual	6	5	Edit	OUS	Local only	No	1
6	1	Virtual	6	6	Edit	OUS	Local only	No	1

The UDP Port range for RTP (through NAT) is found in **V-SIPGW Shelf Properties** (not SIP-EXT Shelf) > Nat Traversal 1 (regardless of whether SIP Trunks are used in the PBX or not). There should be no need to change from the default unless there is a clash with existing customer protocols.

**Shelf Property - Virtual SIP Gateway**

« Main Timer **NAT Traversal 1** NAT Traversal 2 NAT Traversal 3 NAT Traversal 4 NAT Traversal 5 NAT Traversal 6 »

Name	:	<input type="text"/>
NAT Traversal	:	<b>Fixed IP Addr.</b> ▼
NAT - Voice (RTP) UDP Port No.	:	<b>16000</b>
NAT - Keep Alive Packet Sending Ability	:	Disable ▼
NAT - Keep Alive Packet Type	:	Blank UDP ▼
NAT - Keep Alive Packet Sending Interval (s)	:	20
NAT - Fixed Global IP Address	:	123.123.123.123
STUN Ability	:	Disable ▼
STUN Client Port Number	:	33478
STUN External Address Detection Retry Counter	:	1 ▼
STUN Resending Interval	:	500 ms ▼

\*) Perform System Reset for changes to take effect.

**“Fixed IP Addr.” should be set on NAT Traversal 1 table to enable this RTP port range:**

**SIP RTP Port starting number.**  
**NS Series: 16000**  
**NSX/NSV: 21000**

**PBX Port programming for both Internal and External port numbers must be configured to match the router/firewall programming.**

**Site Property - Main**

Main VoIP-DSP Options VoIP-DSP Options 2 **Port Number** LAN Status Media Relay SIP Extension Echo Cancel

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
TLS Port No. for SIP Extension Server	: 5061
Signalling (PTAP) UDP Port No. (Server)	: 9300
Signalling (MGCP) UDP Port No. (Server)	: 2727
Signalling (MGCP) TLS Port No. (Server)	: 2728
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
Firmware Update Port No. for IP-PT/IP-CS (Media Relay)	: 31021
LOGIN Port Number	: 33321
CTI Port Number	: 33333
Built-in Communication Assistant Server	<b>Internal Port</b> 33334
FOS Interface Port Number	: 31000

**Restart to apply changes**

**Communication Assistant**

User Login

CA Server Address

First 192.168.0.101 Port: 33334

Second 123.123.123.123 Port: 33334

Public IP Address External Port

102

Password

NOTE: Example using "Second" IP address assuming that the "First" IP Address is for local access when PC is inside the LAN

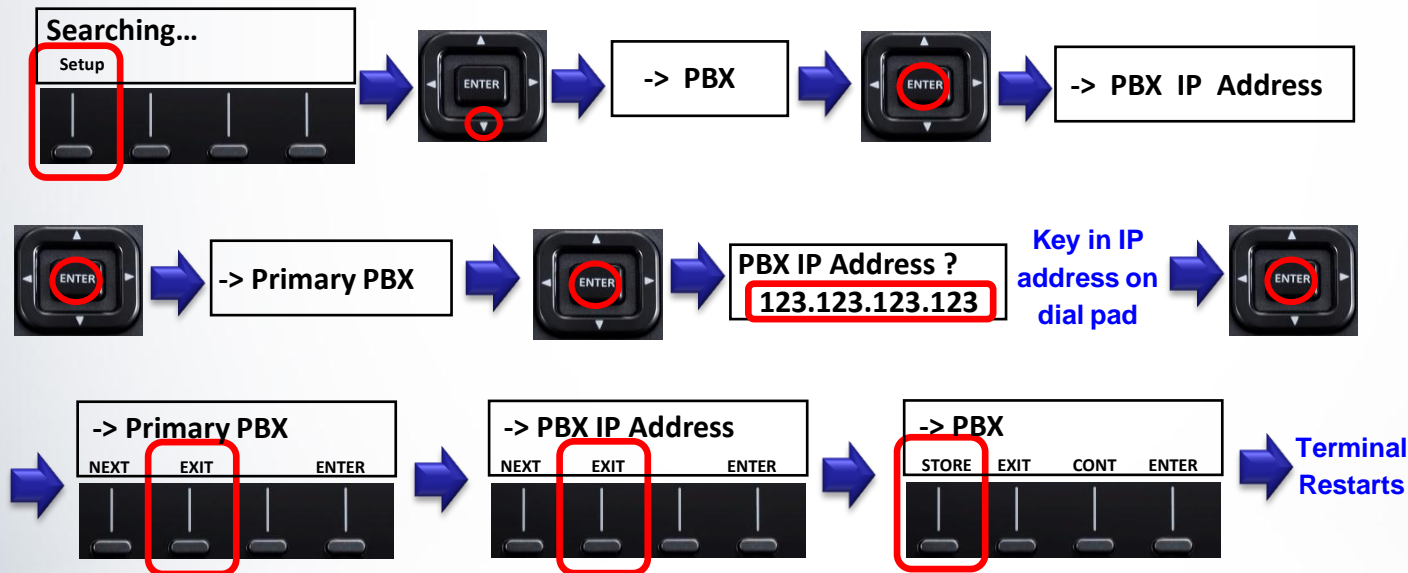
**Default port numbers displayed**



# Device Programming



Unless DHCP Server configuration is possible at the remote location, NT devices need to be configured with the public/global NAT IP address as the Primary PBX address manually.



## NT551 Keys

PAUSE/ PROGRAM	Setup
SP-PHONE	Enter
HOLD	Exit
AUTO DIAL/ STORE	Store

IP-Softphone (for PC) must be manually configured with the public/global NAT IP address for the target PBX to register/connect to:

On first start up:

Network Setting

PBX setting

Specify the PBX Address.

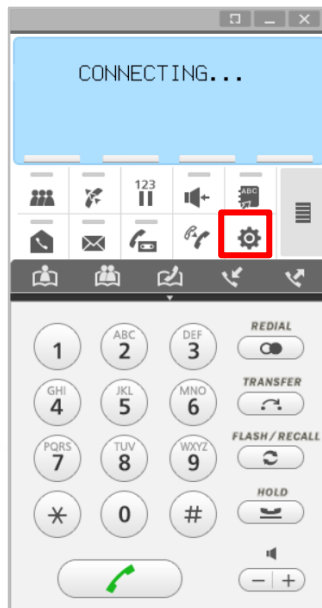
First: 192.168.0.101

Second: 123.123.123.123

OK Cancel

**NOTE:** Example using “Second” IP address assuming that the “First” IP Address is for local access when PC is inside the LAN

If already configured for another IP address:



Options

Audio | Recording | Dial Paste | **Network** | About

PBX setting

Specify the PBX Address.

First: 192.168.0.101

Second: 123.123.123.123

Network status indication

Automatic PING command to IP extension card of PBX

☒ Enable Ping

Every 15s

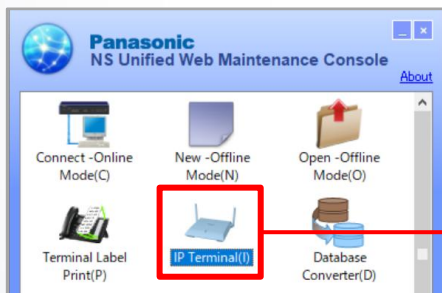
Result of PING command is displayed as follows.

Level 5	0 ms - 200 ms
Level 4	201 ms - 500 ms
Level 3	501 ms - 900 ms
Level 2	901 ms - 1400 ms
Level 1	1401 ms - 2000 ms
Level 0	2001 ms - 5000 ms

OK Cancel

Unless DHCP Server configuration is possible at the remote location, NS0154 units need to be configured with the public/global NAT IP address as the Primary PBX address manually.

## WebMC Offline Tool:



IP Terminal Maintenance Console V2.0.1.00

- 1 Configure DIP Switch for IP Terminal
- 2 Connect IP Terminal using default IP address
- 3 Configure IP Terminal Setting

Network Settings | Port Settings | Quality of Service | LAN Sync diagnosis | Site survey | Version

Network Settings

DHCP Client	Enable
IP address	0.0.0.0
Subnet Mask	0.0.0.0
Default Gateway	0.0.0.0
PBX IP Address (Primary)	123.123.123.123
PBX IP Address (Secondary)	0.0.0.0
PBX Change Time	60
Speed/Duplex	Auto

Read Device Data << Back Next >> Exit

Unless DHCP Server or configuration provisioning is available at the remote location, HDV and TGP600 devices must manually be configured through local Web Admin.

SIP Settings	
<b>User Agent</b>	
User Agent	Panasonic-{MODEL}/{fwver} ({mac})
<b>NAT Identity</b>	
Enable Rport (RFC 3581)	<input checked="" type="radio"/> Yes <input type="radio"/> No
Enable Port Punching for SIP	20 seconds [10-300, 0: Disable]
Enable Port Punching for RTP	20 seconds [10-300, 0: Disable]
<input checked="" type="button" value="Save"/> <input type="button" value="Cancel"/>	

Under VoIP – SIP Settings

1. Enable Rport (Yes)
2. Change both SIP and RTP Port Punching to 20 seconds
3. Save

Unless DHCP Server or configuration provisioning is available at the remote location, HDV and TGP600 devices must manually be configured with public/global NAT IP and SIP-TLS port number

**Panasonic**  
KX-HDV130

Status Network System **VoIP** Telephone Maintenance

Logout

Web Port Close

**VoIP**

SIP Settings

- Line 1

- Line 2

VoIP Settings

- Line 1

**SIP Settings [Line 1]**

Basic

Phone Number 301

Registrar Server Address 123.123.123.123

Registrar Server Port 36061 [1-65535]

Proxy Server Address 123.123.123.123

Proxy Server Port 36061 [1-65535]

Transport Protocol ☐ UDP ☐ TCP ☒ TLS

TLS Mode ☐ SIPS ☒ SIP-TLS

Under VoIP – SIP Settings (Line 1)

1. Enter global NAT address for both Registrar and Proxy Server Address

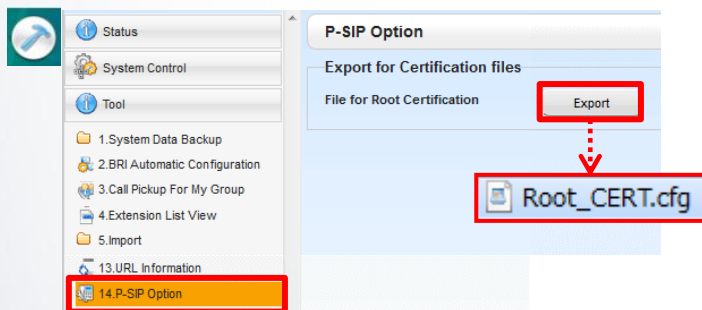
2. Change both Registrar and Proxy Server port number to public side SIP-TLS port number e.g. **36061**

3. Change both Transport protocol and TLS Mode to TLS

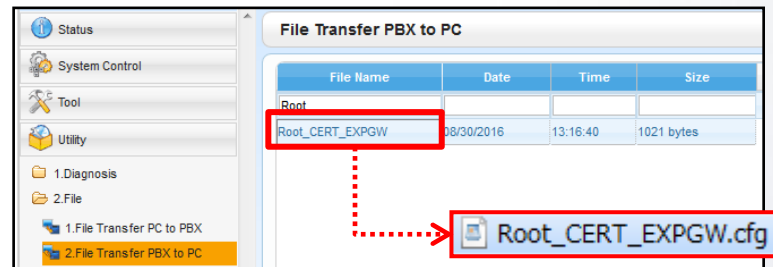
4. Save

For HDV Series and TGP600 to authenticate and assure registration is only possible to the configured target PBX SIP Server, the PBX Root\_CERT.cfg file can be exported from the PBX and imported to the SIP device via the configuration file provisioning process (see appendix).

If registering to main system:

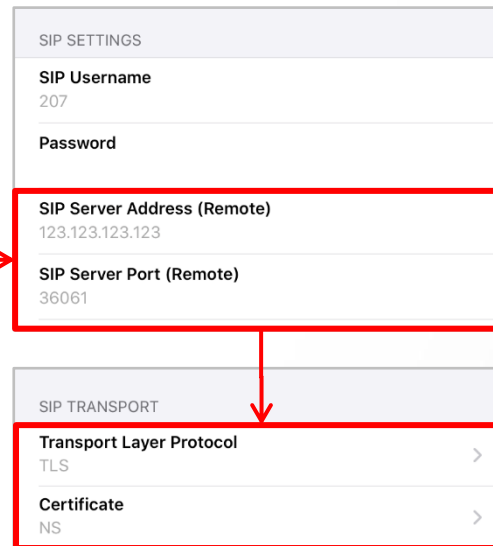
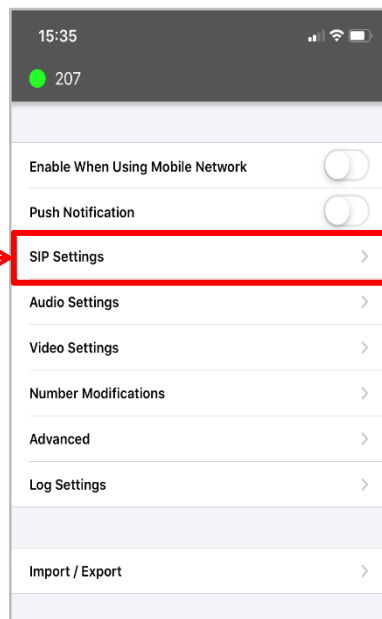
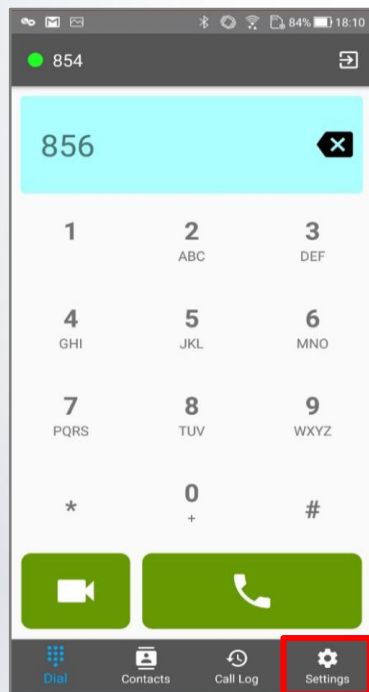


If registering to NSX ExpansionGW:



From V3 Mobile Softphone client, settings can be configured by either QR Code, CSV import or manually within the app itself.

(refer to V3 Mobile Softphone technical guidance for further details on QR Code/CSV Settings).



1. Enter the global NAT address for SIP Server Address (Remote)

2. Enter port number for public side SIP-TLS port number e.g. **36061**

3. Select TLS and select the appropriate certificate for the PBX in use.



CA must be manually configured with the public/global NAT IP address for the target PBX to register/connect to:

Communication Assistant

User Login

CA Server Address

First	Port
192.168.0.101	: 33334
Second	Port
123.123.123.123	: 33334

Extension Number  
106

Password

**NOTE:** Example using “Second” IP address assuming that the “First” IP Address is for local access when PC is inside the LAN

Communication Assistant

User Login

CA Server Address

First	Port
192.168.0.101	: 33334
Second	Port
123.123.123.123	: 33334

Extension Number  
106

Password

☐ Automatically login

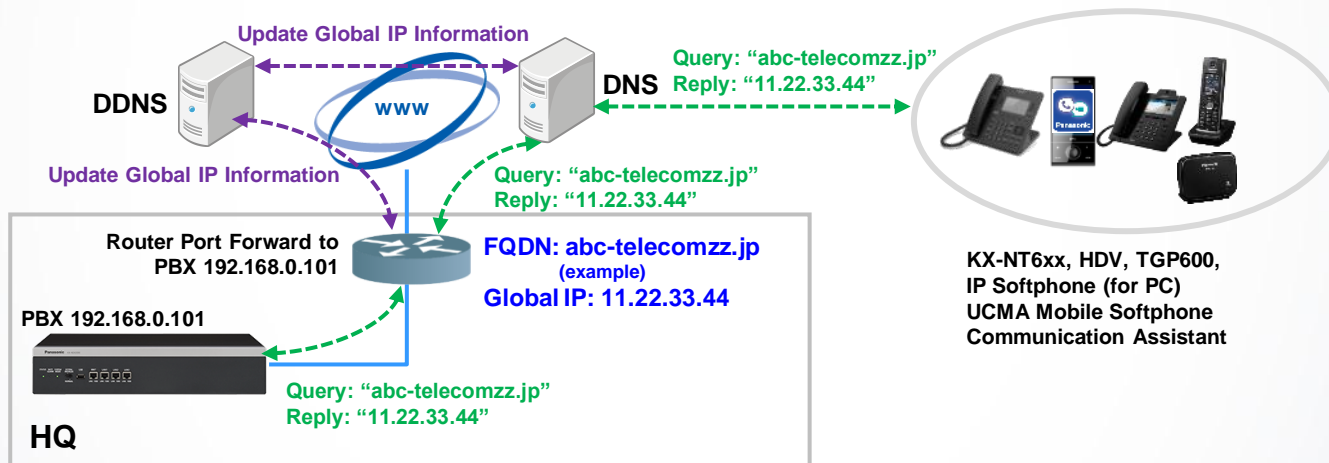
Login Quit



# Additional - FQDN

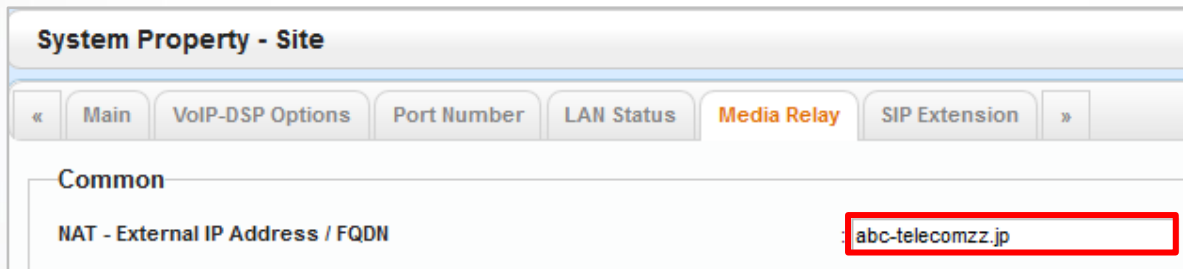
# FQDN - Fully Qualified Domain Name

FQDN can be assigned as PBX instead of global IP address for MRG Remote IP extensions.



**NOTE:** internet / edge router must use DDNS in order to update the IP address when it is changed.

FQDN is entered in place of External IP Address for Media Relay NAT settings:



The screenshot shows the 'System Property - Site' configuration window. At the top, there is a navigation bar with tabs: «, Main, VoIP-DSP Options, Port Number, LAN Status, Media Relay (highlighted in orange), SIP Extension, and ». Below the navigation bar, the 'Common' section is visible. Under 'Common', there is a label 'NAT - External IP Address / FQDN' followed by a text input field containing the value 'abc-telecomzz.jp'. The input field is highlighted with a red rectangular border.

**FQDN and IP Address method can technically be used simultaneously but if FQDN is used due to changing Global IP Address then IP address only configured devices will lose connection when Global IP Address changes.**

**(NT5xx/NS0154 do not support FQDN configuration for PBX address).**

“NT Local Settings” must be used on the IP Ext ports with registered NT6xx to change the Primary PBX address on the device to FQDN value (handset reboot required to apply changes):

Main   Option   Voice   Location / P2P <b>NT Local Settings</b>					
No.	Extensic Number	Extension Name (20 characters)	IP-PT Type	Primary PBX IP Address	Secondary PBX IP Address
1	103	User_0003	KX-NT680	abc-telecomzz.jp	

After the NT6xx Terminal has been reprogrammed with the FQDN value from the PBX NT Local Settings configuration, the PBX server address cannot be seen within the terminal Setup screens:

```

PBX IP Address ?
  . . . . .
EXIT CLEAR ENTER
  
```

**When using FQDN, IP address DNS resolution is initiated only during NT6xx start up process.** The process will not be repeated during normal operation but when FQDN related IP address changes, NT6xx devices will lose connection with PBX following Keep Alive timeout and so will reboot and reconnect with refreshed FQDN IP resolution.

HDV and TGP600 SIP Line settings can use FQDN entry in place of public/global IP address.  
PBX real IP address must also be entered in the Service Domain parameter.

**Panasonic**

KX-HDV130

Status Network System **VoIP** Telephone Maintenance

Logout

Web Port Close

**SIP Settings [Line 1]**

**VoIP**

SIP Settings

- Line 1

- Line 2

**VoIP Settings**

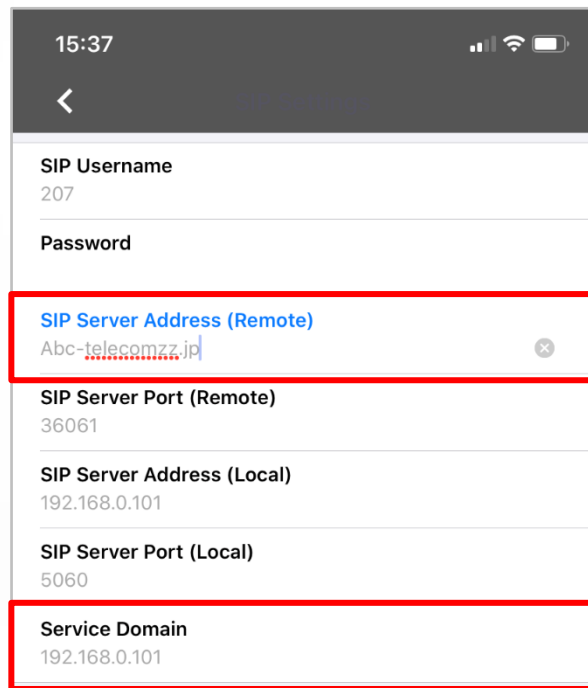
- Line 1

- Line 2

**Basic**

Phone Number	301
Registrar Server Address	abc-telecomzz.jp
Registrar Server Port	36061 [1-65535]
Proxy Server Address	abc-telecomzz.jp
Proxy Server Port	36061 [1-65535]
Presence Server Address	
Presence Server Port	36061 [1-65535]
Outbound Proxy Server Address	
Outbound Proxy Server Port	36061 [1-65535]
Service Domain	192.168.0.101

Mobile Softphone SIP settings can use FQDN entry in place of public/global IP address.  
PBX real IP address must also be entered in the Service Domain parameter.



15:37

<

SIP Username  
207

Password

SIP Server Address (Remote)  
Abc-telecomzz.jp

SIP Server Port (Remote)  
36061

SIP Server Address (Local)  
192.168.0.101

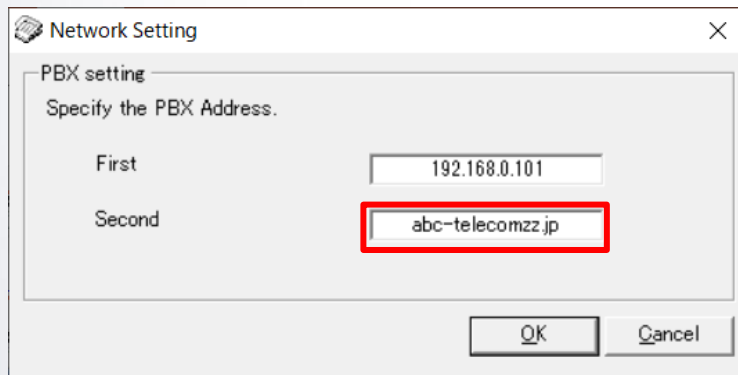
SIP Server Port (Local)  
5060

Service Domain  
192.168.0.101



**IP Softphone (for PC) and CA settings can use FQDN entry in place of public/global IP address. PBX real IP address must also be entered in the Service Domain parameter.**

## IP Softphone



Network Setting

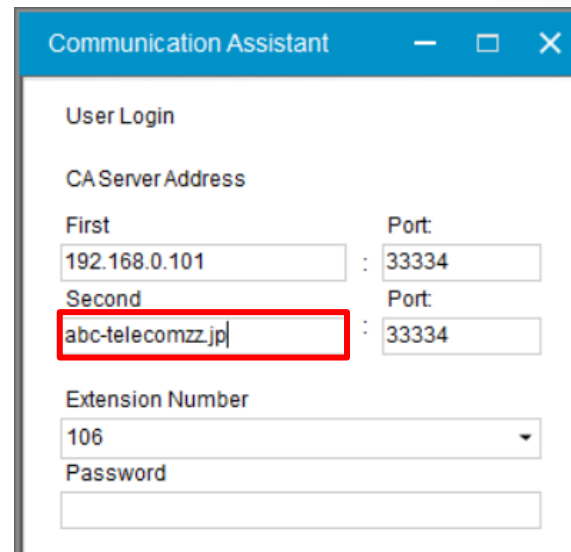
PBX setting  
Specify the PBX Address.

First: 192.168.0.101

Second: **abc-telecomzz.jp**

OK Cancel

## Communication Assistant



Communication Assistant

User Login

CA Server Address

First: 192.168.0.101 Port: 33334

Second: **abc-telecomzz.jp** Port: 33334

Extension Number: 106

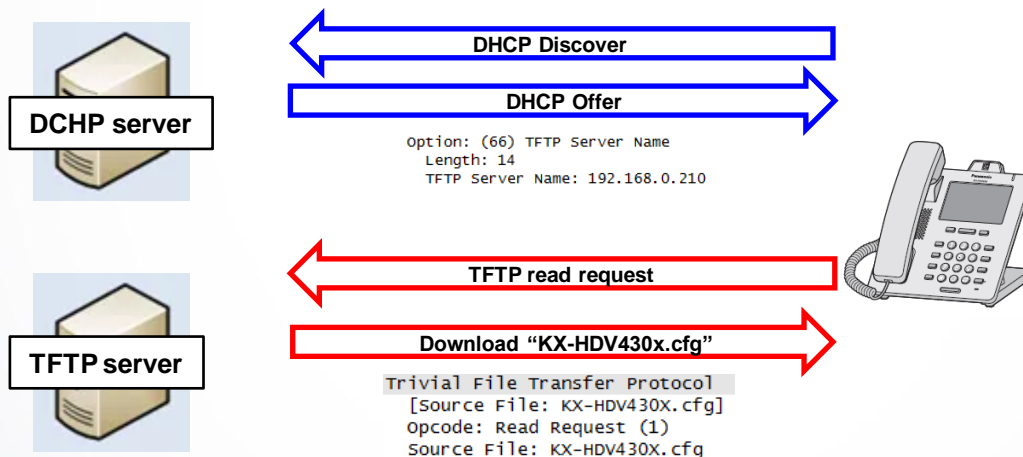
Password:



# Appendix

HDV/TGP600 Configuration can be completed using DHCP Options and TFTP Server delivery of predefined configuration files.

HDV/TGP600 will accept TFTP Server location for configuration file provisioning using DHCP **Option 66** parameter.



Configuration file requested depends on model number and region code suffix:

"KX-HDV430NE.cfg" for HDV430NE model

"KX-HDV130X.cfg" for HDV130X model

"KX-TGP600UK.cfg" for TGP600UK model

## HDV/TGP600 SIP-SRTP/-TLS related setting

The “Product” configuration file can set common parameters across all similar phone models. It can then also direct the individual device to specific configuration based on their unique MAC address to provide separate configuration to each device such as SIP registration details or button programming etc.

Example configuration file for Common settings and MAC based configuration file setup:

```
# PCC Standard Format File # DO NOT CHANGE THIS LINE!
```

```
SIP_TRANSPORT_1="2"
```

```
SIP_TLS_MODE_1="1"
```

```
SIP_TLS_VERIFY_1="1"
```

```
SIP_TLS_ROOT_CERT_PATH="tftp://192.168.0.210/Root_CERT.cfg"
```

```
## NTP Settings
```

```
NTP_ADDR="192.168.0.101"
```

```
TIME_SYNC_INTVL="60"
```

```
TIME_QUERY_INTVL="43200"
```

```
CFG_STANDARD_FILE_PATH="tftp://192.168.0.210/Config{mac}.cfg"
```

- Enables TLS for encrypted registration
- Enables SIP-TLS mode for encrypted type
- Enables verification of the PBX Root Certificate
- Certification file name for PBX is “Root\_CERT.cfg”  
(Certification file name for NSX ExpansionGW is “Root\_CERT\_EXPGW.cfg”)

Set NTP server address

- Direct each device to look for individual configuration file based on MAC address e.g. “Config080023c8a249.cfg”

## HDV/TGP600 SIP-SRTP/-TLS related setting

Individual configuration details can be provided to the HDV/TGP600 terminals using the MAC based configuration:

Example configuration file for “VoIP > SIP > Line1 Settings”

```
# PCC Standard Format File # DO NOT CHANGE THIS LINE!
```

```
PHONE_NUMBER_1="301"
```

```
SIP_AUTHID_1="301"
```

```
SIP_PASS_1="SIP301P4ssw0rd"
```

```
SIP_RGSTR_ADDR_1="123.123.123.123"
```

```
SIP_RGSTR_PORT_1="36061"
```

```
SIP_PRXY_ADDR_1="123.123.123.123"
```

```
SIP_PRXY_PORT_1="36061"
```

```
SIP_ADD_RPORT="Y"
```

```
PORT_PUNCH_INTVL="20"
```

```
RTP_PORT_PUNCH_INTVL="20"
```

Device registration parameters:

- PBX extension number and password
- Public/Global IP address and port number
- Port punching for MRG use

HDV430 needs additional command for SIP-TLS:

```
SIP_TLS_RANDOM_PORT="N"
```

## Remote Setup for multiple IP-PT/IP-CS in same location

A function that can simplify the set up of remote devices is the Announce Mode feature of V-IPEXT and V-IPCS4 ports. With the first remote IP-PT or IP-CS manually registered and Announce Mode Enabled on that port allows other IP Terminals on the same LAN to learn the Primary PBX IP Address from that first device, avoiding the need to manually program every remote device.



Port Property - Virtual IP Extension					
Registration De-registration Forced De-registration					
Main Option Voice Location / P2P NT Local Settings					
No.	Extension Number	Extension Name (20 characters)	IP-PT Type	Reserved	Announce Mode
1	109		-		Enable
2	110		-		Disable
3	111		-		Disable

**IP-PT1- Extension 109 – from default**

- Connect to LAN – DHCP assigned IP address
- Manual input Primary PBX IP Address on IP-PT
- Registered Successfully
- Announce Mode Enabled at PBX

**IP-PT2 – Extension 110 – from new/default**

- Connect to LAN - DHCP assigned IP address
- Broadcast for Primary PBX IP address
- IP-PT1 responds with PBX IP address = 123.123.123.123
- Router passes PBX Registration request to network
- Registered Successfully

In all cases, for MRG to function correctly, router SIP-ALG/MGCP-ALG etc should be disabled. For guidance on how to disable ALG settings, please check following article:

<https://icomplete.freshdesk.com/support/solutions/articles/11000006588-how-to-disable-sip-alg-on-some-popular-routers->

For further detail on SIP-ALG also check the following article:

<https://icomplete.freshdesk.com/support/solutions/articles/1000165155-what-is-the-sip-alg-setting-on-my-router-and-how-can-this-affect-my-voip-service->





END

**20201019 : MRG\_StepByStep\_rev2.3\_Oct2020.pptx**

- #8 Add PC Softphone in title
- #12 Add new slide (CA TLS)
- #17 Add new slide (Router setting)
- #30 Add new slide (CA Port)
- #34 Change setting screen
- #40 Add new slide (CA setting)
- #47 Add new slide (IP Softphone & CA FQDN)

**20201019-02 : MRG\_StepByStep\_rev2.31\_Oct2020.pptx**

- #24 Change sentence (NT630/680 only) -> (NT630/680 & IP Softphone only)

**20201020 : MRG\_StepByStep\_rev2.32\_Oct2020.pptx**

- #53 Modified
- #55 Add Modification list

**20201021 : MRG\_StepByStep\_rev2.33\_Oct2020.pptx**

- #7, 8, 14, 18, 19, 20, 23, 24, 34, 47 Change word PC Softphone / IP Softphone -> IP Softphone (for PC)

**20201103: rev 2.4 NOV 2020**

- changed slide order for CA (always last page of section), changed Master template to Panasonic business, changed wording on #19, 30, 31, 34, 40, 42, 43, 53