KX-NS PBX
Remote IP Extension

June 2, 2014

Panasonic System Networks
PBX SE team

Specifications are subject to change without notice.

1. Overview

Built-in MRG feature supports remote IP extension without VPN.

MRG = Media Relay Gateway

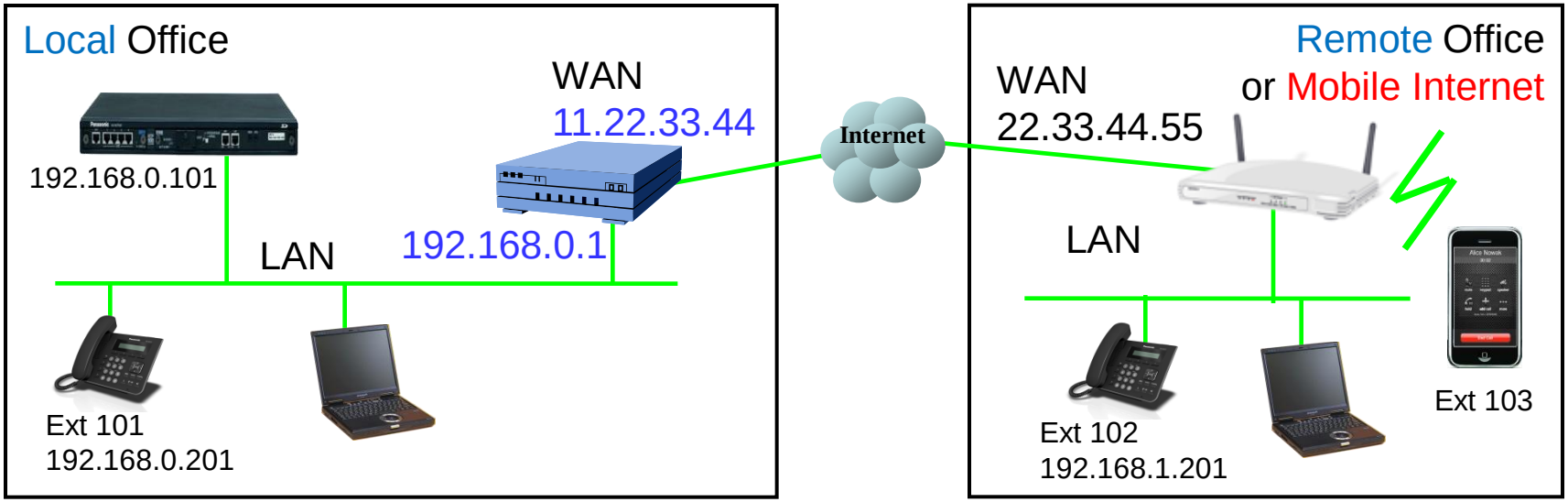
KX-NS1000 : Version 3 or later
Other KX-NS PBX : Any Version

Following phones support this feature.

- KX-NT543/NT546/NT560 (Version up of phone software is required.)
- KX-NT511 and KX-NT550 series
- KX-UT series
- 3rd party SIP phone with Blank UDP transmit capability. (Video phone is also supported.)

Other phones do not support this feature.

KX-UDT / KX-NT300 series / KX-NT300 based software phone

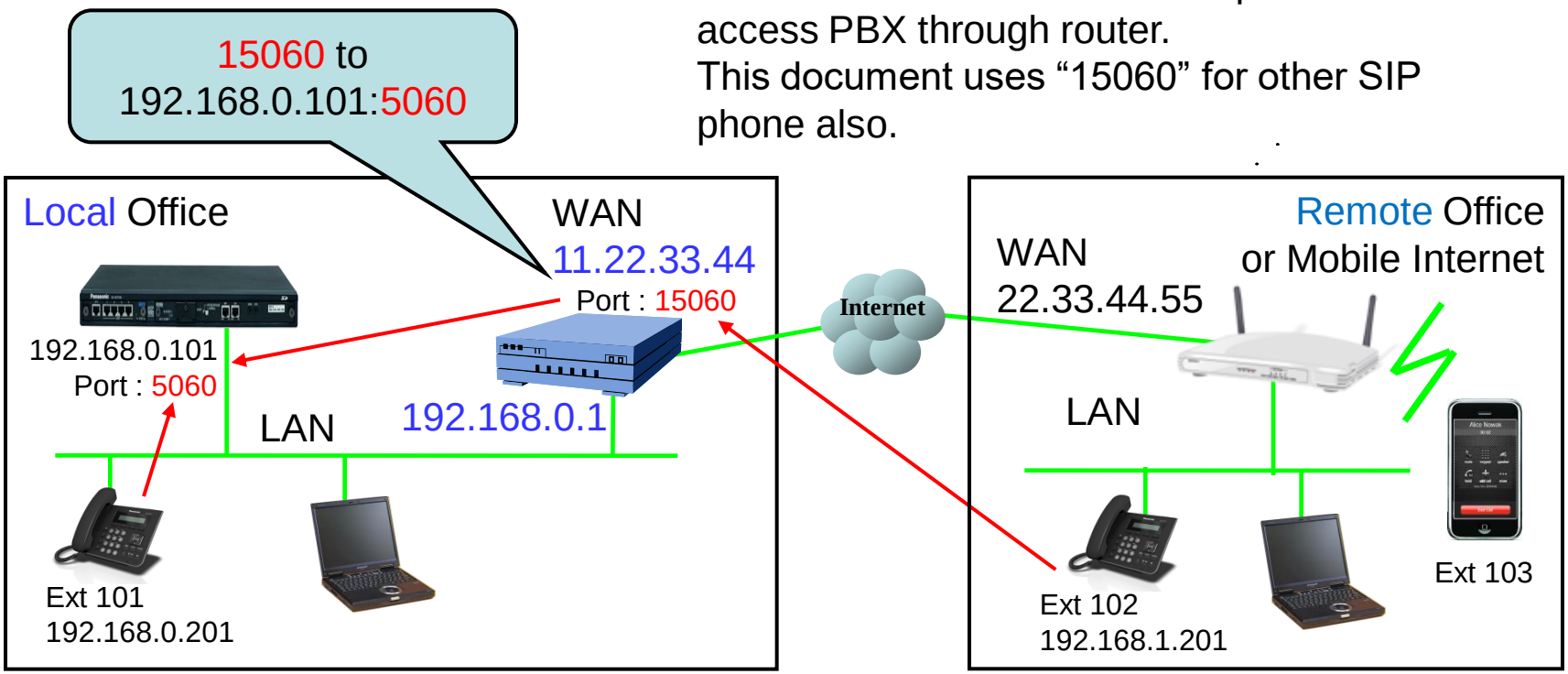


2. Concept of Programming

Only 3 PBX programming are required for remote connection.
(1) PBX has to know global IP address of router. 11.22.33.44
(2) Do not forget setting of default gateway. 192.168.0.1
(3) PBX has to know location of each IP extension. Local or Remote

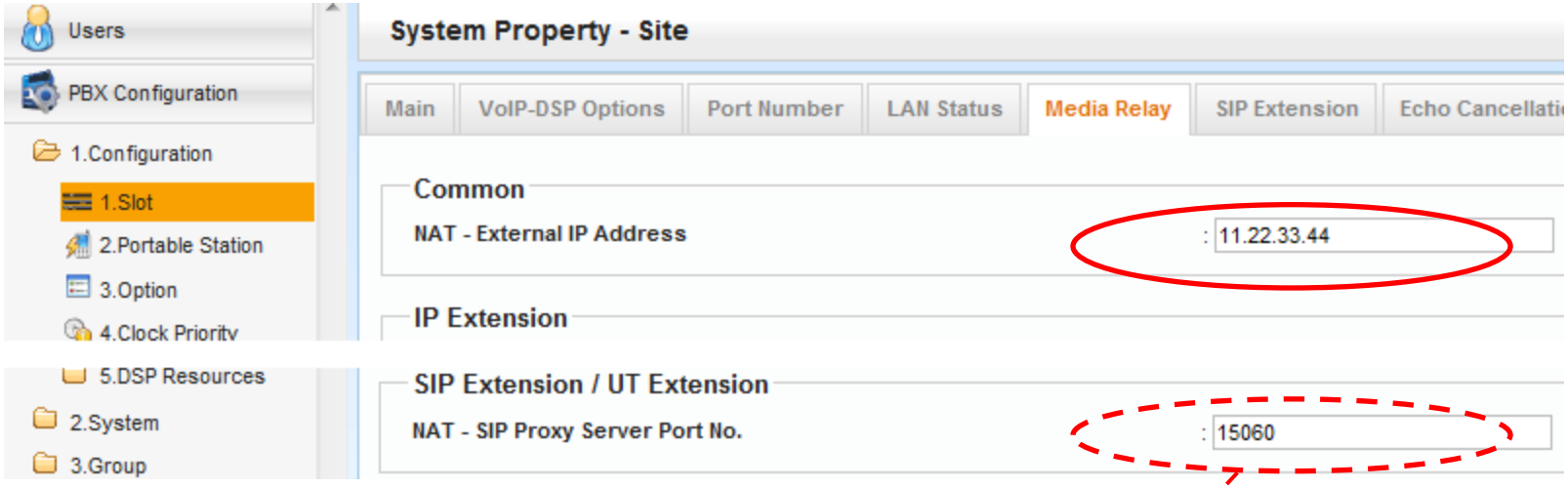
Port Fwd is required to router.
(Not only 15060)

"5060" is too famous as port for SIP.
"5060" has high risk for attacking by hacker.
KX-UT in remote location uses port "15060" to access PBX through router.
This document uses "15060" for other SIP phone also.

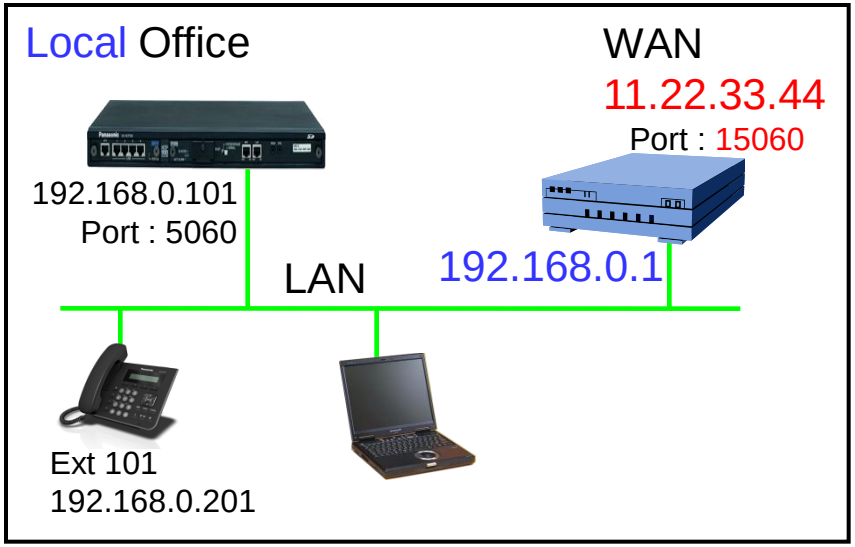


Chapter 1
PBX Programming

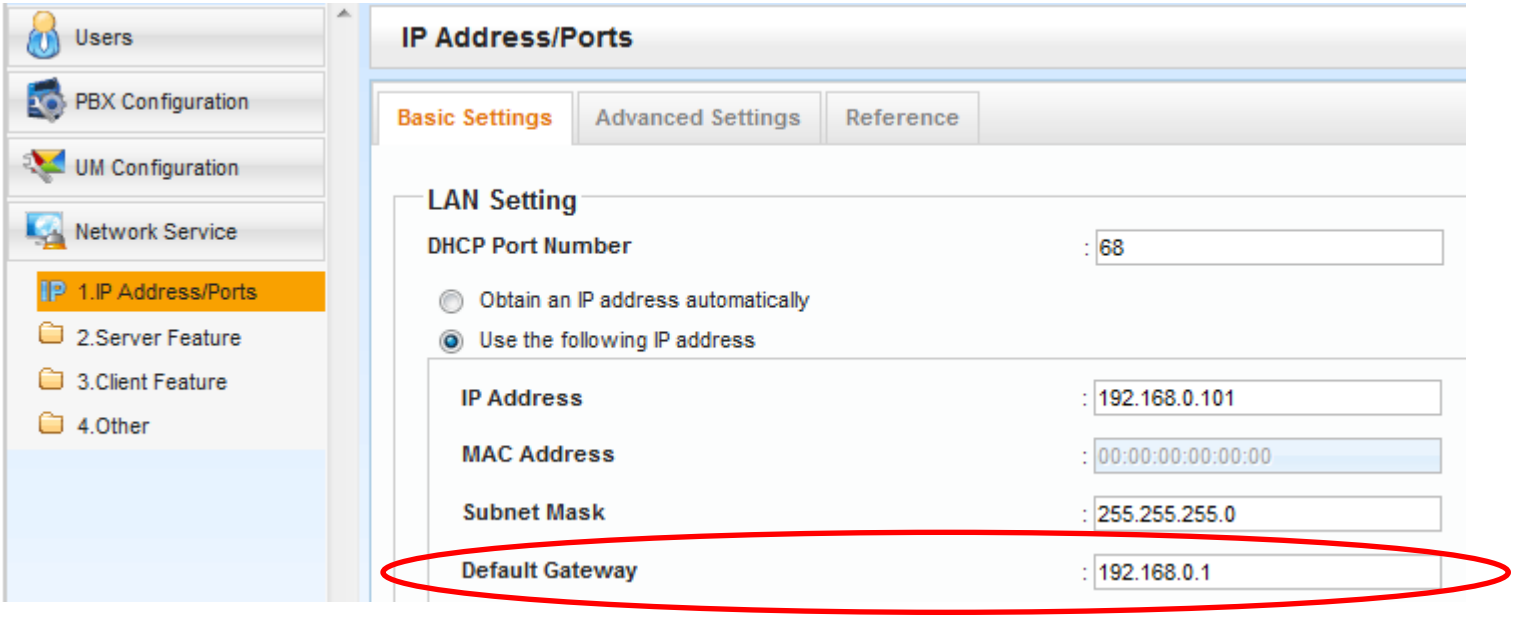
11. Assign Global IP Address of Router.

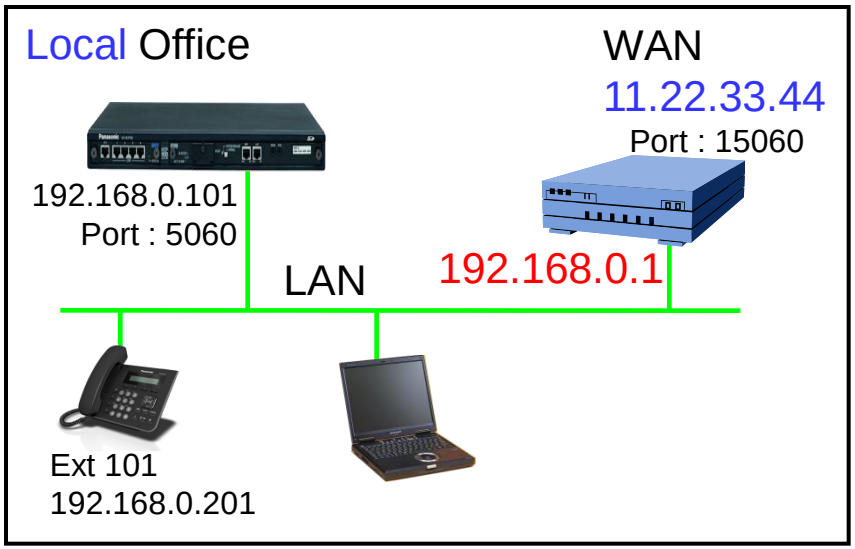


Default is OK.



12. Assign Default Gateway.

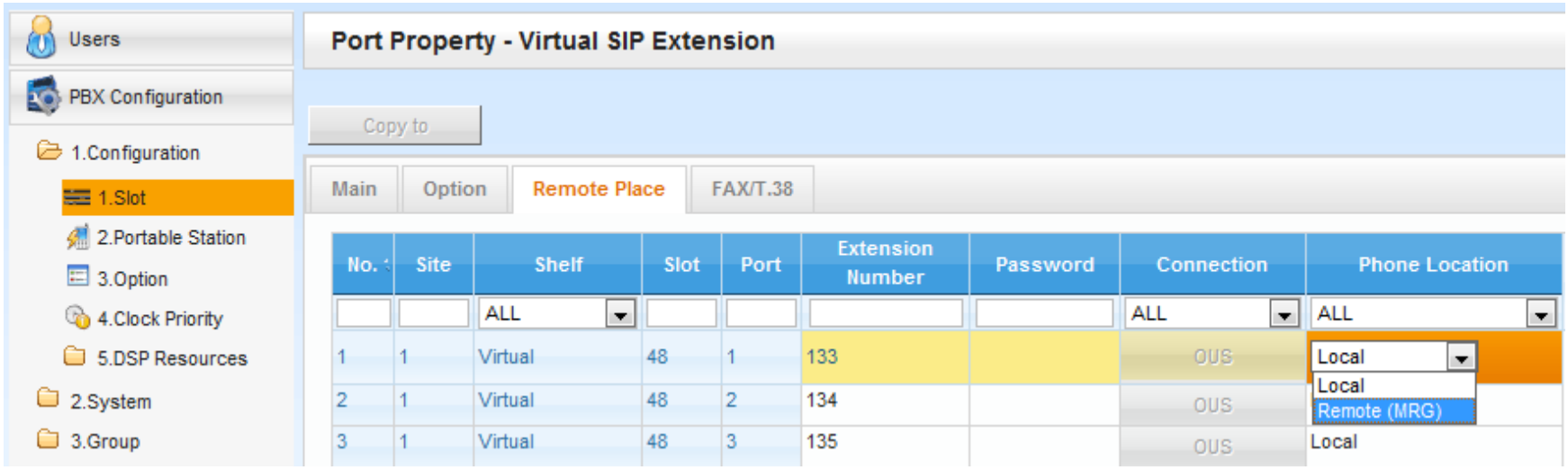


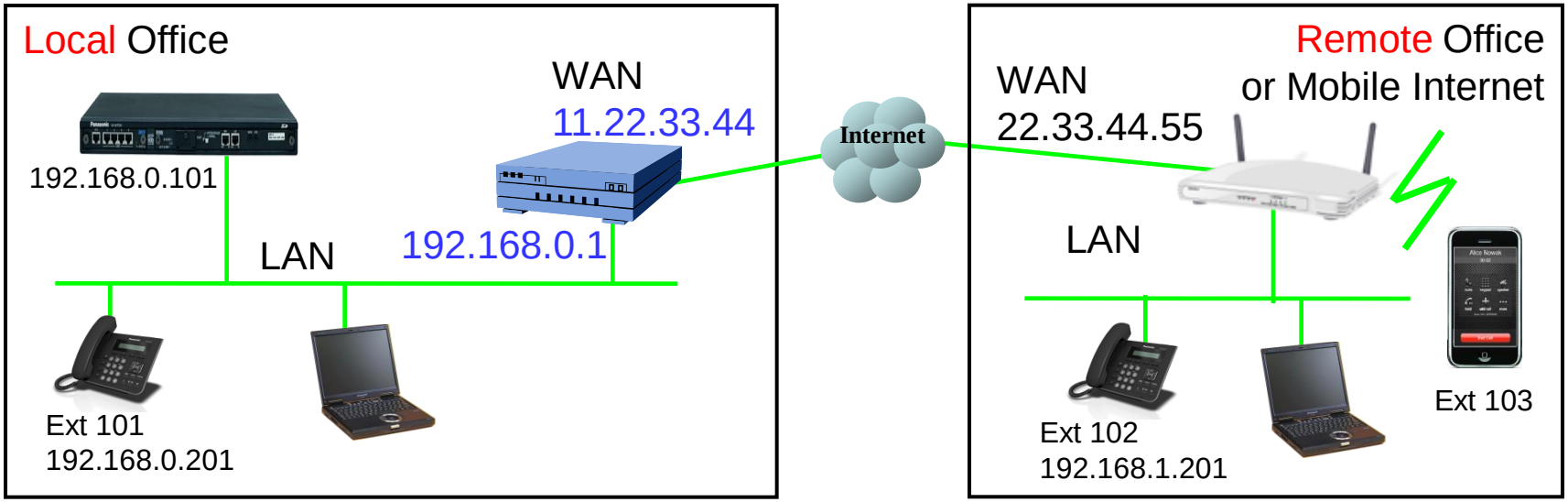


Default gateway is required not only for remote IP extension but also for many other purpose.

13. Assign Location of SIP Extension.

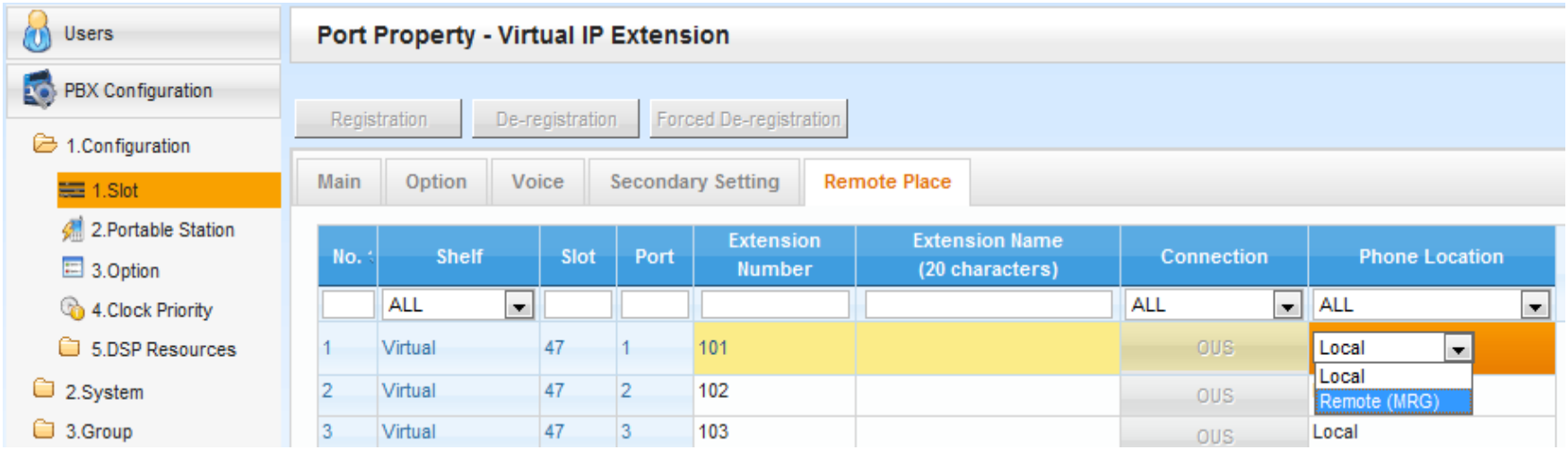
< 3rd party SIP Phone >





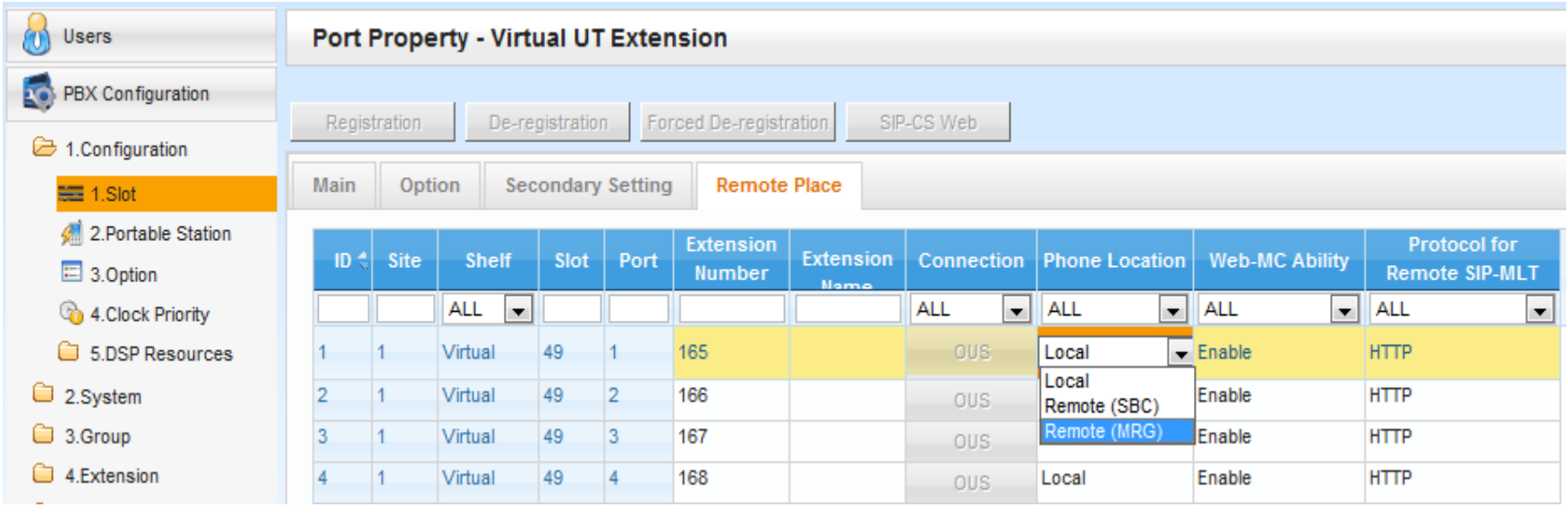
14. Assign Location of KX-NT500.

< KX-NT500 >



15. Assign Location of KX-UT.

< KX-UT >



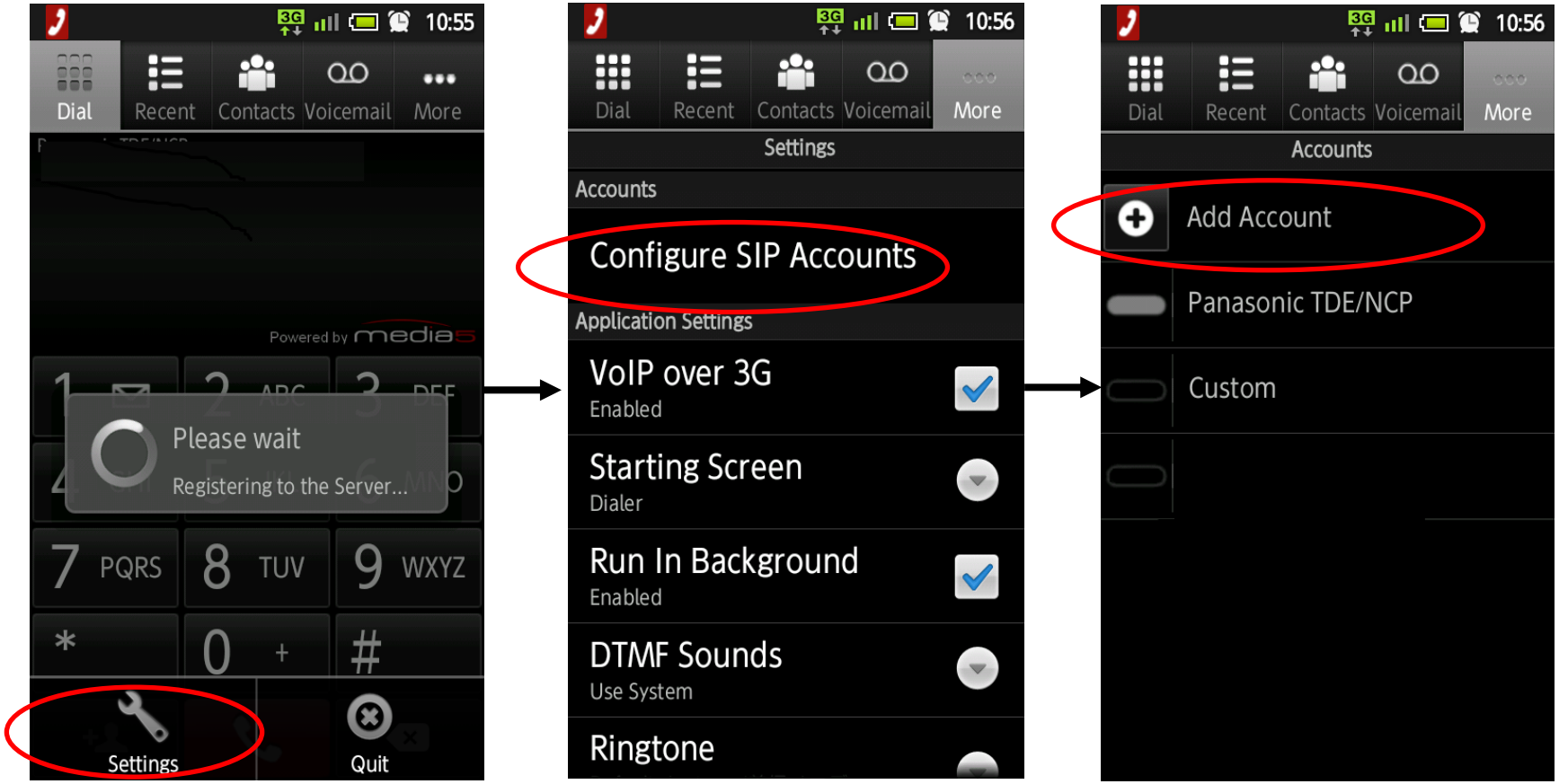
SBC : Session Boarder Controller
(3rd party equipment is required.)

Secure communication is available using HTTPs for KX-UT.
- TR069(CWMP) is available with https.
- Maximum 20 KX-UT phone can use this feature.
  Each one KX-NS1000 in one-look network supports 20 KX-UT with this feature.

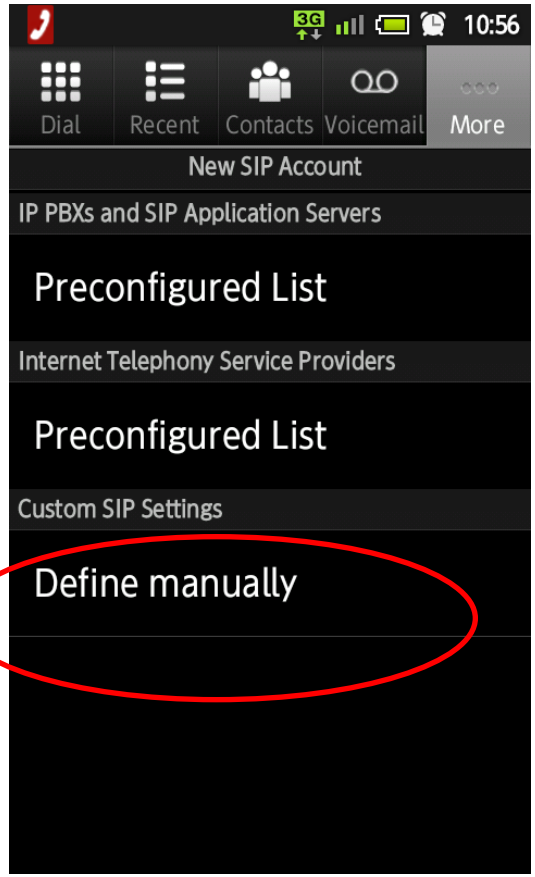
Chapter 2
SIP Phone Setting

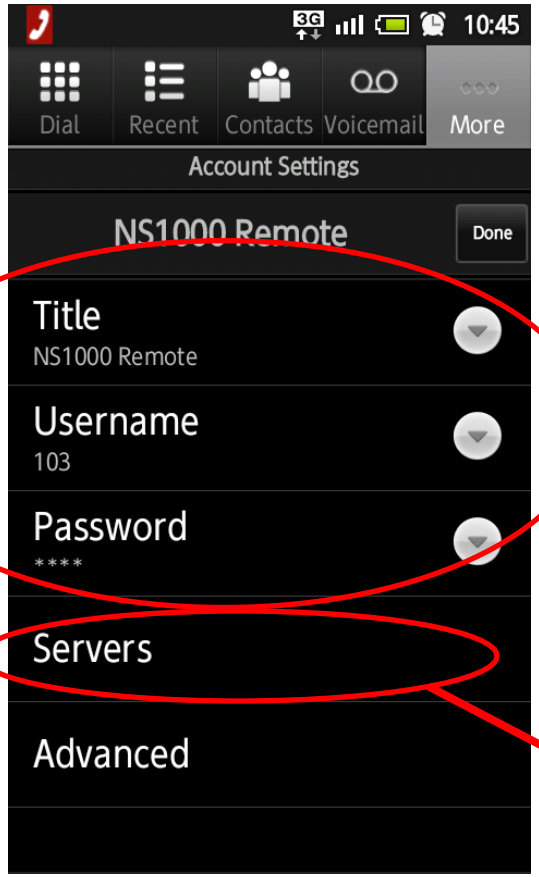
SIP Software Phone for Smart-phone by Media5 is used in this chapter as example.

21. Configure SIP Account.



22. Assign Ext Number & PIN to log-in.

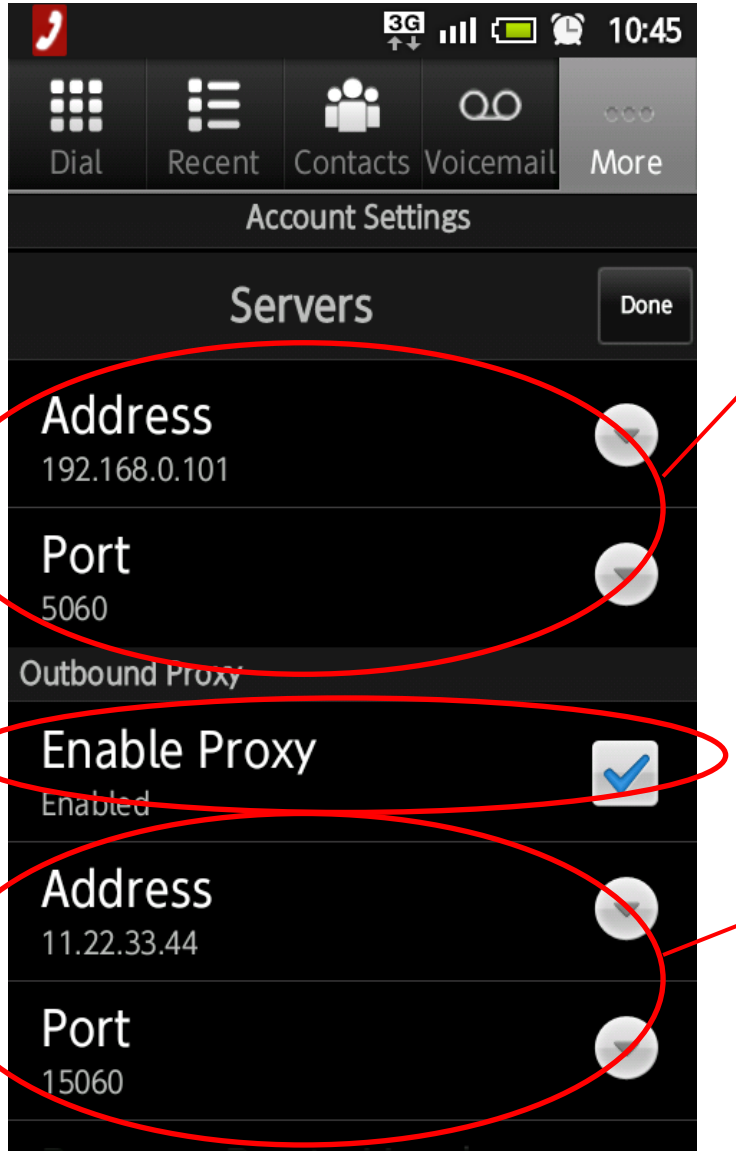


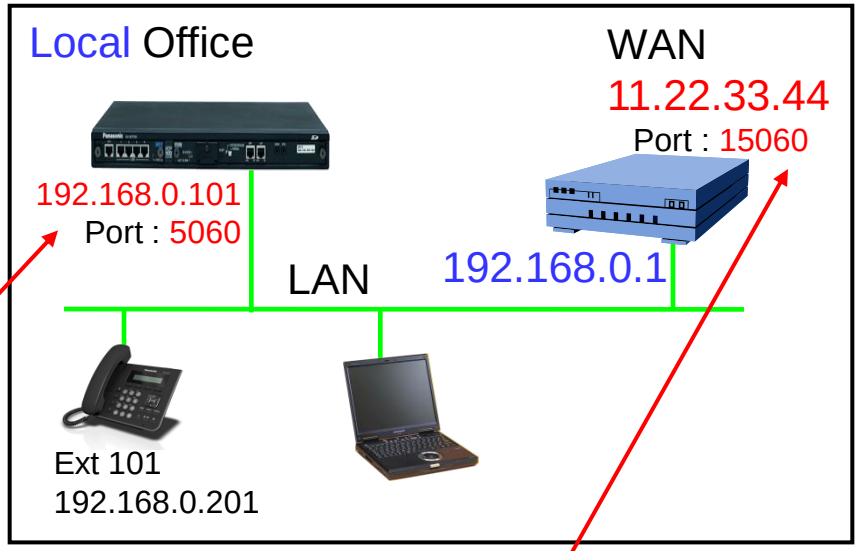


See next page.

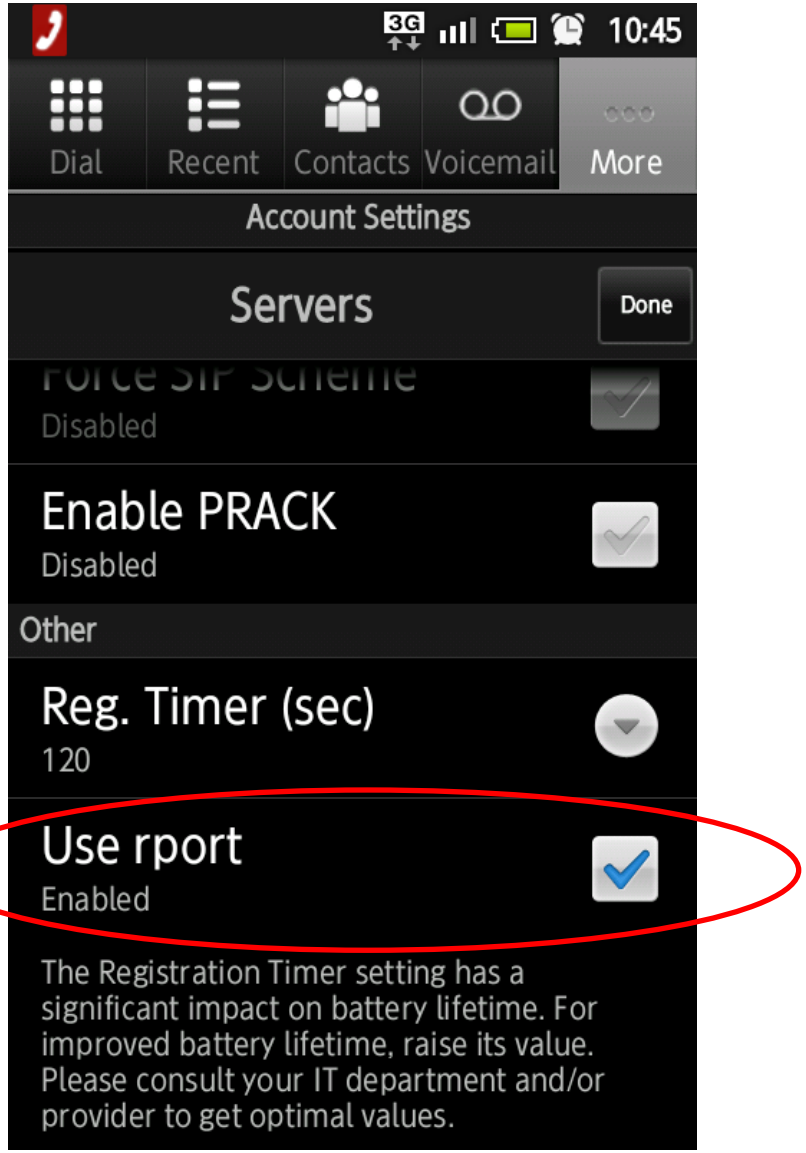
Title = Reference
Username = Extension Number
Password = SIP Password of PBX

23. Assign Destination to log-in.





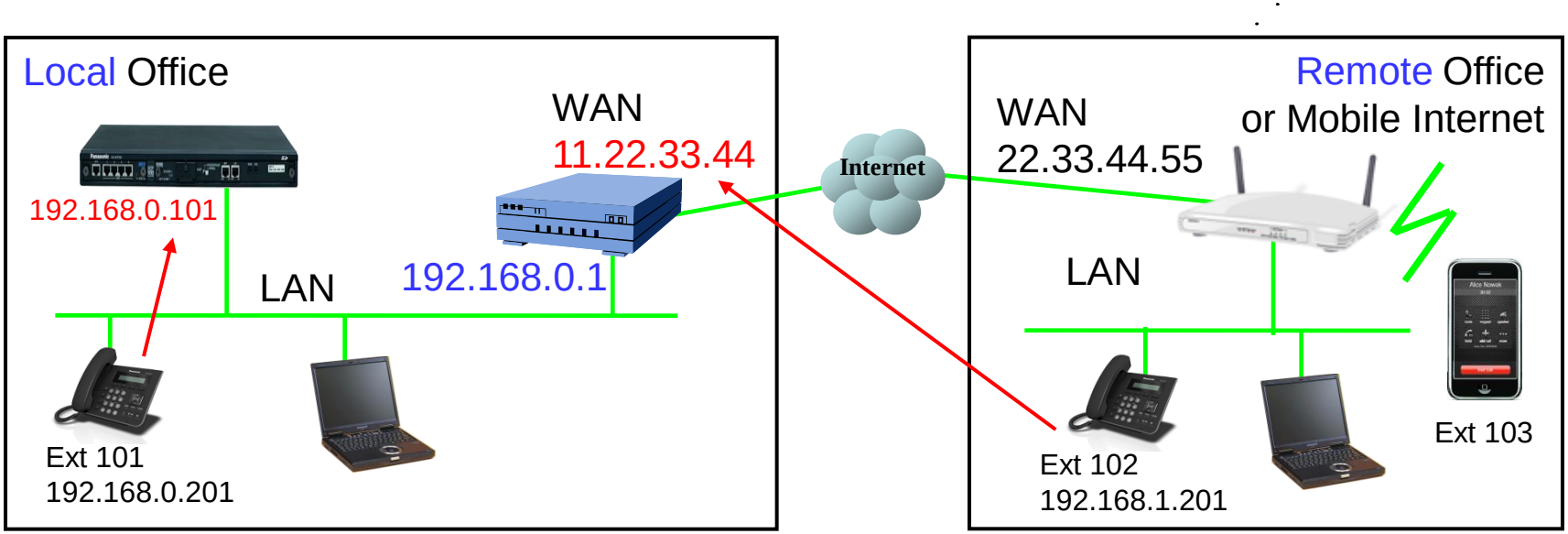
24. Enable “rport”.



Chapter 3
KX-NT/UT Phone Setting

31. KX-NT500 : Assign Router as Destination.

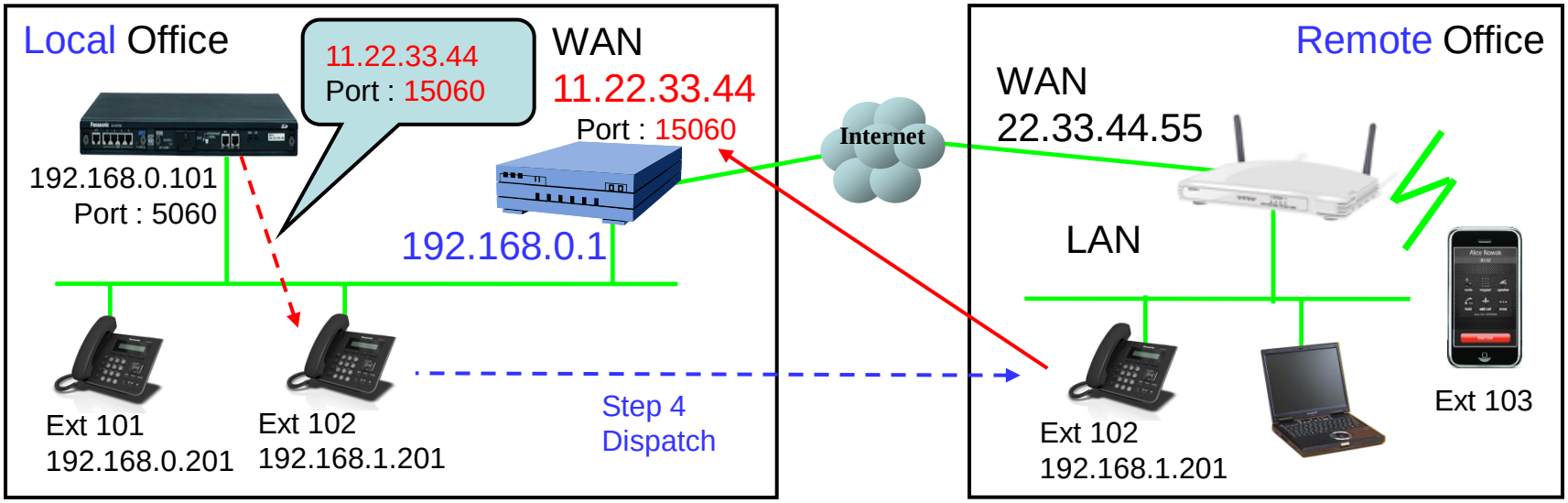
Assign global IP address of router (11.22.33.44 for example) as destination instead of PBX local address (192.168.0.101 for example), when KX-NT phone is installed in remote office.



32. KX-UT : Connect in Local Office.

1. Connect KX-UT phone in local office. (Not remote office)
2. Change PBX setting for this extension from “Local” to “Remote”.
3. Restart KX-UT by power off and on again. Error may display but OK.
4. Dispatch KX-UT to remote office.

Destination from remote office (11.22.33.44:15060 for example) is automatically informed to KX-UT phone from PBX at step 3.



Operation is not required in remote office to connect KX-UT phone to PBX.
All you have to do is to connect KX-UT phone to LAN in remote office.

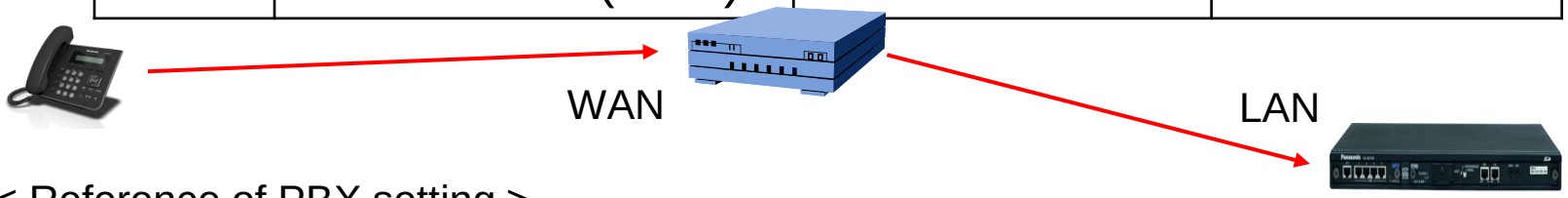
Chapter 4
Router Programming

Port forwarding is required for router.

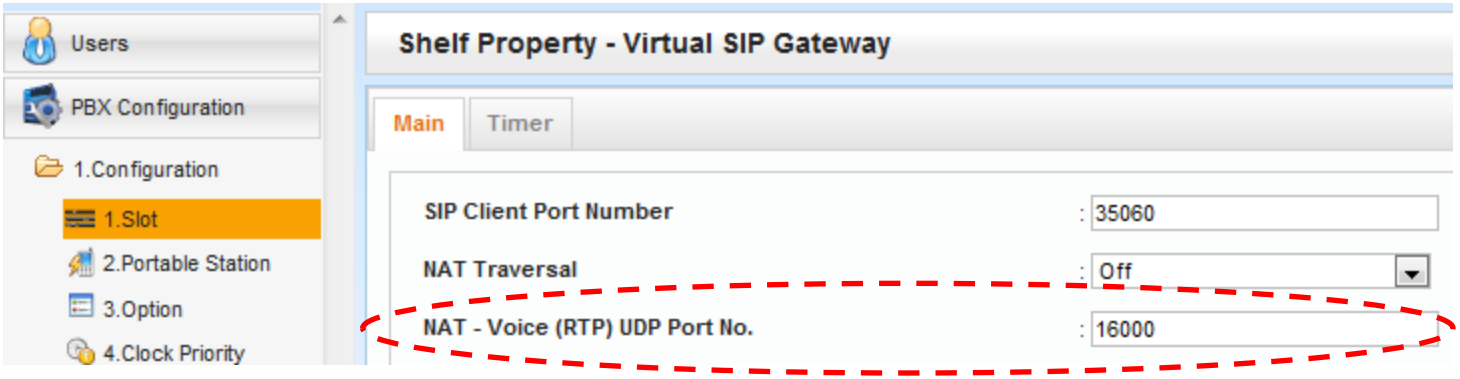
41. Port Fwd to DSP

< for 3rd party SIP Phone / KX-NT500 / KX-UT >

Protocol	Range of port number (WAN)	Destination	Description
RTP	16000-16511(UDP)	192.168.0.102	to DSP#1-1
	16512-17023(UDP)	192.168.0.103	to DSP#1-2
	17024-17535(UDP)	192.168.0.104	to DSP#2-1
	17536-18047(UDP)	192.168.0.105	to DSP#2-2



< Reference of PBX setting >
Default is OK.
This parameter is common for IP trunk and IP extension.



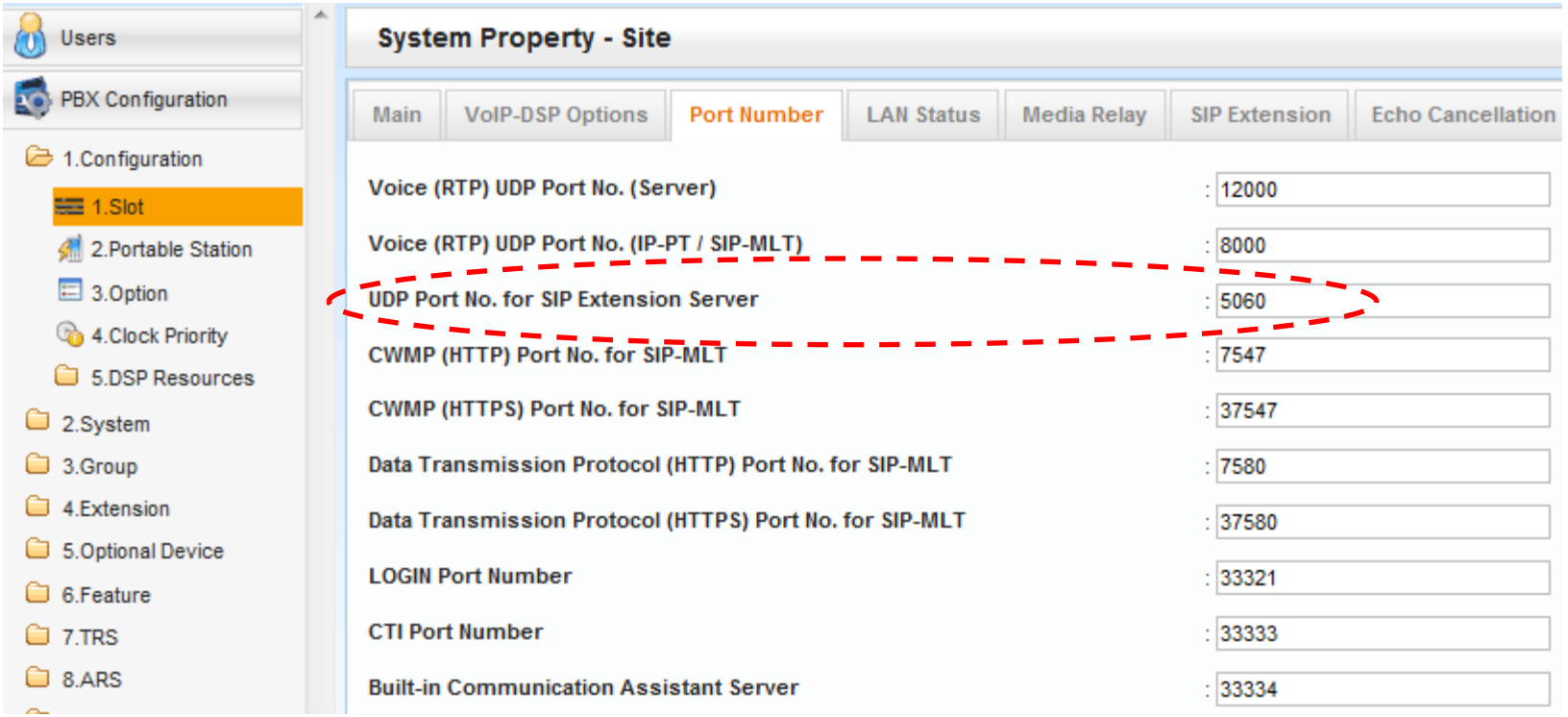
42. Port Fwd to PBX LAN : SIP

< for 3rd party SIP Phone >

Protocol	Port number	Destination
SIP	15060(UDP)	192.168.0.101:5060(UDP)

Port number conversion is required from 15060 to 5060.

< Reference of PBX setting >
Default is OK.

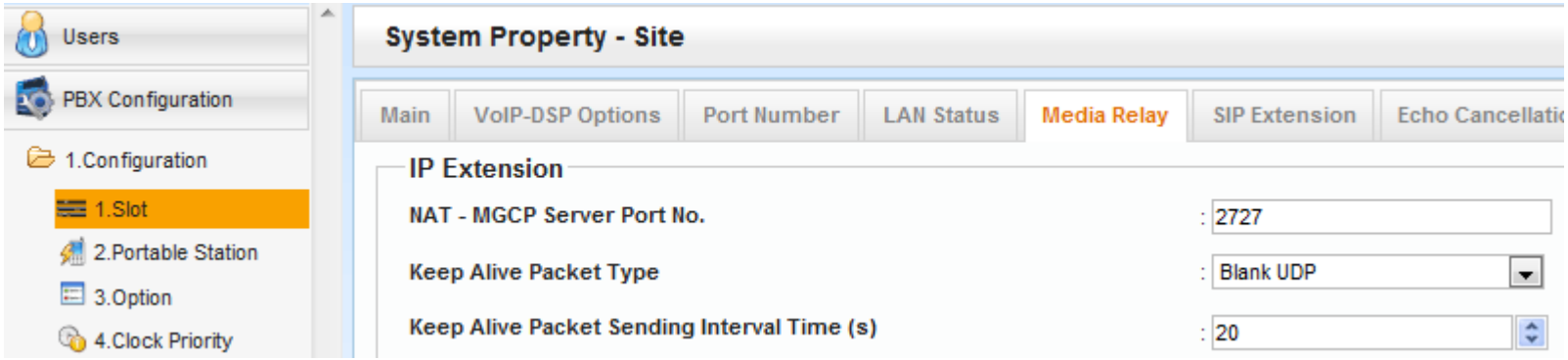


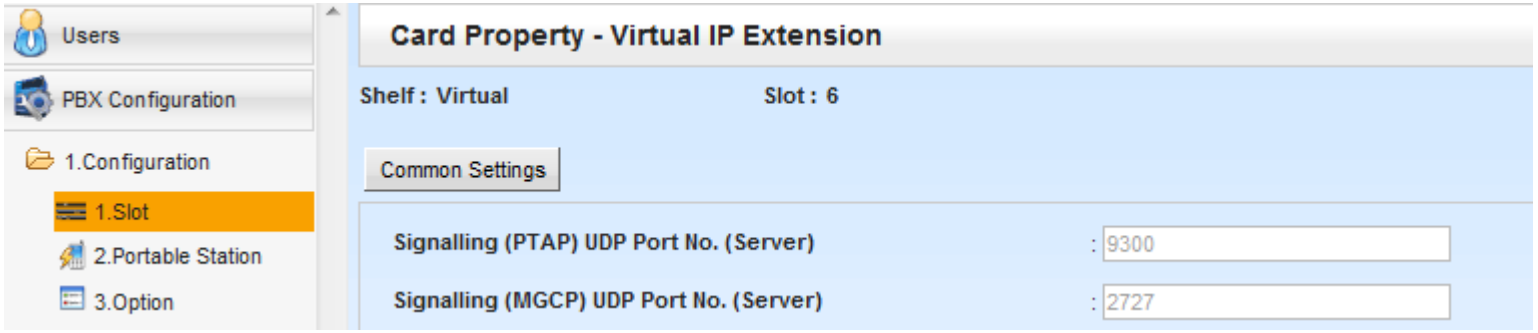
43. Port Fwd to PBX LAN : KX-NT500

< for KX-NT500 >

Protocol	Port number	Destination
MGCP	2727(UDP)	192.168.0.101
PTAP	9300(UDP)	192.168.0.101

< Reference of PBX setting >
Default is OK.



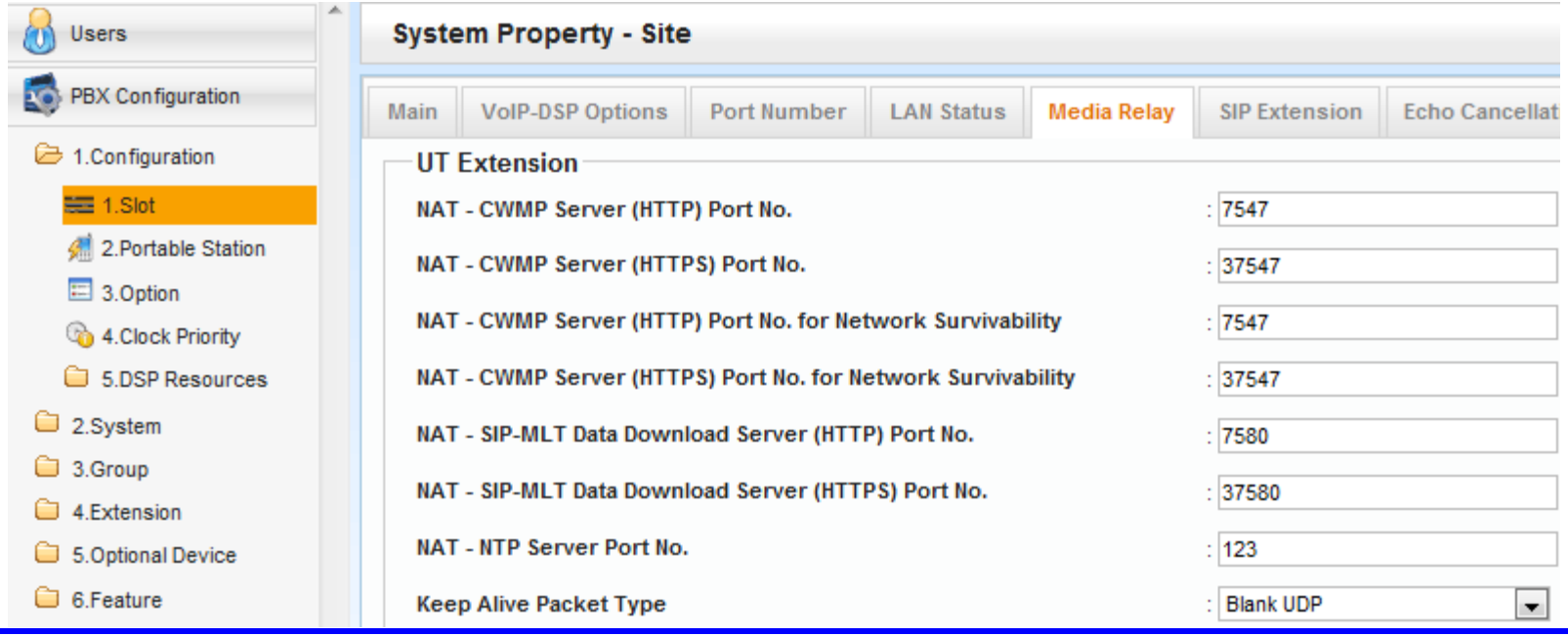


44. Port Fwd to PBX LAN : KX-UT

< for KX-UT >

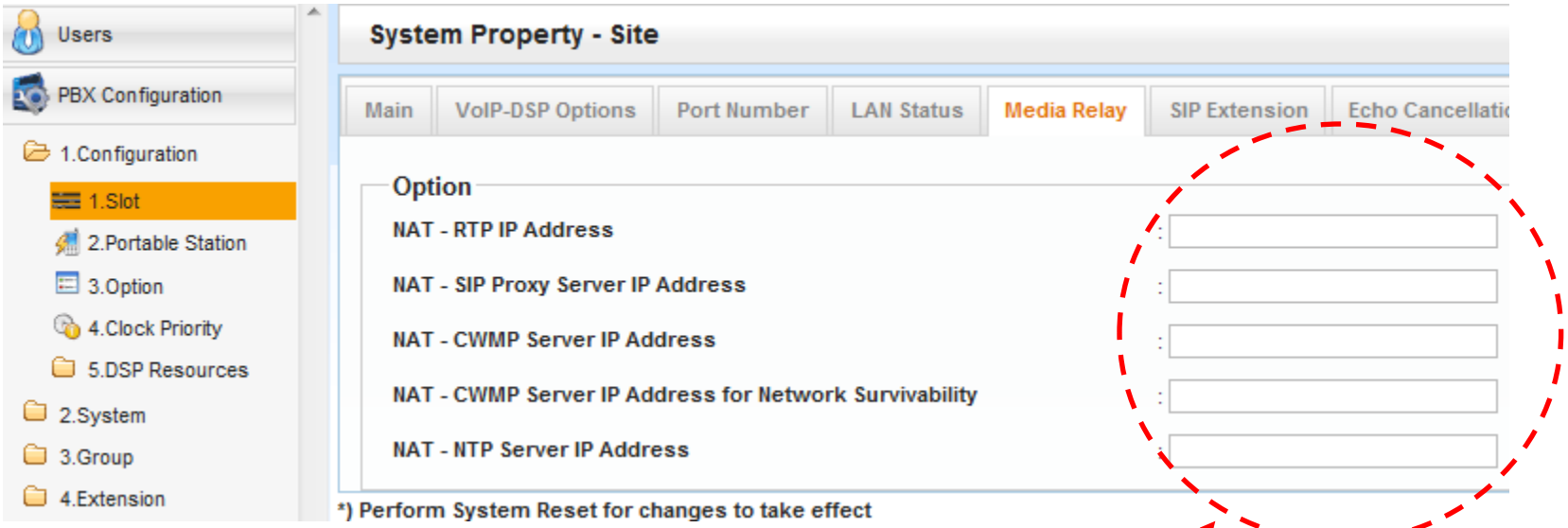
Protocol	Port number	Destination
SIP	**15060(UDP)**	**192.168.0.101:5060(UDP)**
CWMP (HTTP)	**7547(TCP)**	**192.168.0.101**
CWMP (HTTPS)	**37547(TCP)**	**192.168.0.101**
SIP-MLT Data Download (HTTP)	**7580(TCP)**	**192.168.0.101**
SIP-MLT Data Download (HTTPS)	**37580(TCP)**	**192.168.0.101**
NTP	**123(UDP)**	**192.168.0.101**

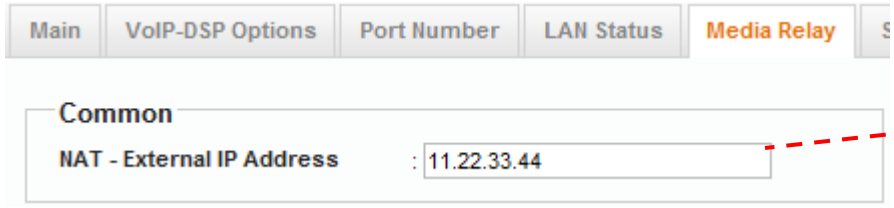
< Reference of PBX setting > Default is OK.



45. Port Fwd to PBX LAN : KX-UT

< Reference of PBX setting >
Default is OK. (These should be blank.)





This is applied to above,
if above is blank.

46. Condition for External Router

Condition for external router is only as follows.

- Many port fwd setting is required as previous pages.
  But some router does not have enough number of port fwd setting.
  (Range setting is not possible.)

- New router has "SIP ALG" feature.
  But this feature should be disabled by programming.

- Some router by Cisco (Not all router by Cisco) does not have compatibility for KX-NT500 remote connection.
  When MRG feature does not work for KX-NT500, please contact us.

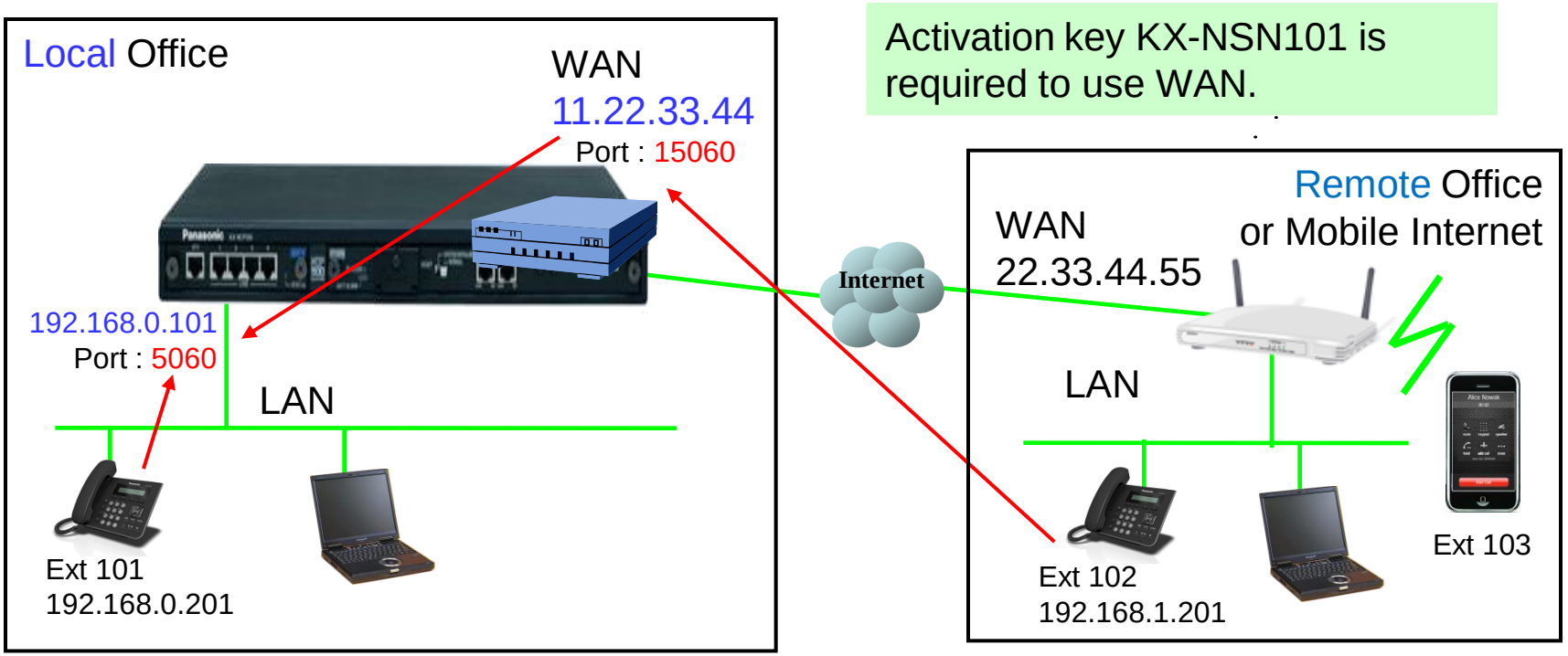
Chapter 5
KX-NS1000 Built-in Router

MRG feature can work with KX-NS1000 built-in router.

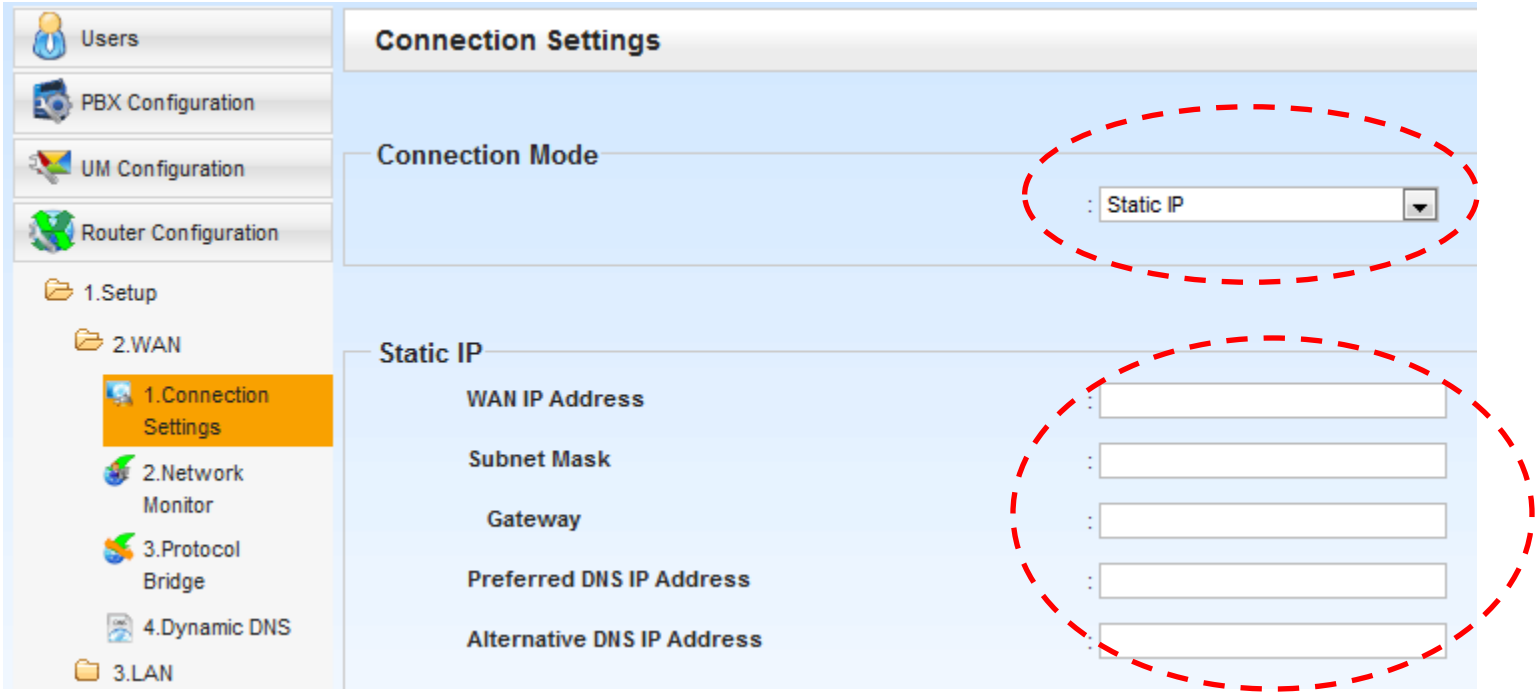
51. Concept of Programming

Programming (1) and (3) are required for remote connection.
(1) PBX has to know global IP address of router. 11.22.33.44
(2) Default gateway programming 192.168.0.101 (No need)
(3) PBX has to know location of each IP extension. Local or Remote

Fixed global IP address for WAN is required as next page. 11.22.33.44
Other settings such as Port Fwd are NOT required.



52. IP Address for WAN



Thank you !

Revision

Date	No.	Change
April 17	All	First release
May 5	46 (Page 24)	Condition for Cisco router was added.
June 2	46 (Page 24)	Condition for Cisco router was revised.