



BroadSoft Partner Configuration Guide

2N IP Intercoms

July 2018

Document Version 1.2

BroadWorks® Guide

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Version	Reason for Change
1.1	Introduced document for 2N IP Intercoms version 2.23.0.32.5 validation with BroadWorks Release 22.0.
1.2	Edited and published document.

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1 Overview

This guide describes the configuration procedures required for the 2N IP Intercoms for interoperability with BroadWorks. This includes the following models:

- 2N® IP Audio Kit
- 2N® IP Force
- 2N® IP Safety
- 2N® IP Solo
- 2N® IP Vario
- 2N® IP Verso
- 2N® IP Video Kit
- 2N® SIP Audio Converter
- 2N® SIP Speaker
- 2N® SIP Speaker Horn

The IP Intercoms is an IP Door Intercom device 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 IP Intercoms. For those details, see the *2N® IP intercom Configuration Manual* [1] supplied by 2N.

2 Interoperability Status

This section provides the known interoperability status of the 2N IP Intercoms 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 2N.

2.1 Verified Versions

The following table identifies the verified 2N IP Intercoms 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 IP Intercoms 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 2N.

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 Phone Interoperability Test Plan* [5].

Verified Versions			
Date (mm/yyyy)	BroadWorks Release	IP Intercoms Verified Version	IP Intercoms Compatible Versions
06/2018	Release 22.0	2.23.0.32.5	Any maintenance release of verified version.

2.2 Interface Capabilities Supported

This section identifies interface capabilities that have been verified through testing as supported by 2N IP Intercoms.

The *Supported* column in the tables in this section identifies the 2N IP Intercoms' 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.

2.2.1 SIP Interface Capabilities

The 2N IP Intercoms has completed interoperability testing with BroadWorks using the *BroadWorks SIP Phone 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.

NOTE: *DUT* in the following table refers to the *Device Under Test*, which in this case is the 2N IP Intercoms.

BroadWorks SIP Phone 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	No	
	Ringback	Yes	
	Forked Dialog	Yes	
	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	
	Third-Party Call Control – Advanced	No	
	Voice Message Deposit/Retrieval	Yes	
	Message Waiting Indicator – Unsolicited	No	
	Message Waiting Indicator – Solicited	No	
	Message Waiting Indicator – Detail	No	
	Voice Portal Outcall	No	
	Advanced Alerting – Ringing	No	
	Advanced Alerting – Call Waiting	No	
Advanced Alerting – Ring Splash	No		

BroadWorks SIP Phone Interoperability Test Plan Support Table			
Test Plan Package	Test Plan Package Items	Supported	Comments
	Advanced Alerting – Silent Alerting	No	
	Calling Line ID	No	
	Calling Line ID with Unicode Characters	No	
	Connected Line ID	No	
	Connected Line ID with Unicode Characters	No	
	Connected Line ID on UPDATE	No	
	Connected Line ID on Re-INVITE	No	
	Diversion Header	Yes	
	History-Info Header	Yes	
	Advice of Charge	No	
	Meet-Me Conferencing	No	
	Meet-Me Conferencing – G722	No	
	Meet-Me Conferencing – AMR-WB	No	
	Meet-Me Conferencing – Opus	No	
	Collaborate – Audio	No	
	Collaborate – Audio – G722	No	
	Collaborate – Audio – Opus	No	
	Call Decline Policy	Yes	
DUT Services – Call Control Services	Call Waiting	No	
	Call Hold	No	
	Call Transfer	No	
	Three-Way Calling	No	
	Network-Based Conference	Yes	
DUT Services – Registration and Authentication	Register Authentication	Yes	
	Maximum Registration	Yes	
	Minimum Registration	Yes	
	Invite Authentication	Yes	
	Re-Invite/Update Authentication	No	
	Refer Authentication	No	
	Device Authenticating BroadWorks	No	
DUT Services – Emergency Call	Emergency Call	No	
	Emergency Call with Ringback	No	
	REGISTER with P-Access-Network-Info Header	No	

BroadWorks SIP Phone Interoperability Test Plan Support Table			
Test Plan Package	Test Plan Package Items	Supported	Comments
DUT Services – P-Access-Network-Info Header	INVITE with P-Access-Network-Info Header	No	
DUT Services – Miscellaneous	Do Not Disturb	Yes	
	Call Forwarding Always	No	
	Call Forwarding Always Diversion Inhibitor	No	
	Anonymous Call	No	
	Anonymous Call Block	No	
	Remote Restart Via Notify	No	
Advanced Phone Services – Busy Lamp Field	Busy Lamp Field	No	
	Call Park Notification	No	
Advanced Phone Services – Feature Key Synchronization, Private Line	Do Not Disturb	No	
	Do Not Disturb Ring Splash	No	
	Call Forwarding	No	
	Call Forwarding Always Ring Splash	No	
	Call Forwarding Always Diversion Inhibitor	No	
	Call Center Agent Logon/Logoff	No	
	Call Center Agent Unavailable Code	No	
	Executive – Call Filtering	No	
	Executive-Assistant – Call Filtering	No	
	Executive-Assistant – Diversion	No	
	Call Recording	No	
Security Classification	No		
Advanced Phone Services – Feature Key Synchronization, Shared Line	Do Not Disturb	No	
	Do Not Disturb Ring Splash	No	
	Call Forwarding	No	
	Call Forwarding Always Ring Splash	No	
	Call Forwarding Always Diversion Inhibitor	No	
	Security Classification	No	
Advanced Phone Services – Missed Calls Display Synchronization	Missed Calls Display Sync	No	
Advanced Phone Services – Shared	Line-Seize	No	
	Call-Info/Lamp Management	No	

BroadWorks SIP Phone Interoperability Test Plan Support Table			
Test Plan Package	Test Plan Package Items	Supported	Comments
Call Appearance using Call Info	Public Hold	No	
	Private Hold	No	
	Hybrid Key System	No	
	Multiple Call Arrangement	No	
	Bridge Active Line	No	
	Bridge Active Line – Silent Monitor	No	
	Call Park Notification	No	
Advanced Phone Services – Call Park Notification	Call Park Notification	No	
Advanced Phone Services – Call Center	Hold Reminder	No	
	Call Information	No	
	Hoteling Event	No	
	Status Event	No	
	Disposition Code	No	
	Emergency Escalation	No	
	Customer Originated Trace	No	
Advanced Phone Services – Call Recording Controls	Pause/Resume	No	
	Start/Stop	No	
	Record Local Conference	No	
	Record Network Conference	No	
Advanced Phone Services – Call Recording Video	Basic Call	No	
	Record Local Conference	No	
	Record Network Conference	No	
Advanced Phone Services – Security Classification	Security Classification	No	
Advanced Phone Services – Conference Event	Network-Based Conference Creator	No	
	Network-Based Conference Participant	No	
	Meet-Me Conference Participant	No	
Redundancy	DNS SRV Lookup	Yes	
	Register Failover/Failback	Yes	
	Invite Failover/Failback	Yes	
	Bye Failover	Yes	
SBC/ALG - Basic	Register	No	
	Outgoing Invite	No	

BroadWorks SIP Phone Interoperability Test Plan Support Table			
Test Plan Package	Test Plan Package Items	Supported	Comments
	Incoming Invite	No	
SBC/ALG – Failover/Failback	Register Failover/Failback	No	
	Invite Failover/Failback	No	
Video – Basic Video Calls	Call Origination	Yes	
	Call Termination	Yes	
	Call Hold	Yes	Support Call hold by the other device.
	Call Waiting	No	
	Call Transfer	Yes	
Video – BroadWorks Video Services	Auto Attendant	No	
	Auto Attendant – HD	No	
	Voice Messaging	Yes	Support Video Voice Message Deposit only.
	Voice Messaging – HD	No	
	Custom Ringback	No	
Video – BroadWorks Video Conference	Network-based Conference	No	
	Network-based Conference – HD	No	
	Collaborate – Video	No	
	Collaborate – Video – HD	No	
Video – BroadWorks WebRTC Client	Call from WebRTC Client	NA	
	Call to WebRTC Client	NA	
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	
	Busy Lamp Field	No	
	Redundancy	No	
	SBC	No	
	Video	No	

BroadWorks SIP Phone Interoperability Test Plan Support Table			
Test Plan Package	Test Plan Package Items	Supported	Comments
	Dual Stack with Alternate Connectivity	No	

2.2.2 Other Interface Capabilities

This section identifies whether the 2N IP Intercoms has implemented support for the following:

- BroadWorks Xtended Services Interface (Xsi)
- Extensible Messaging and Presence Protocol (XMPP) (BroadCloud/BroadWorks Collaborate Instant Messaging and Presence [IM&P])

Support for these interfaces is demonstrated by completing the *BroadWorks SIP Phone Xsi and XMPP Test Plan* [6]. Support for these interfaces is summarized in the following table.

BroadWorks Xtended Services Interface (Xsi) and BroadCloud IM&P Support Table			
Interface	Feature	Supported	Comments
Xsi Features – Authentication	Authenticate with SIP Credentials	No	
	Authenticate with BroadWorks User Login Credentials	No	
	Authenticate with BroadWorks User Directory Number	No	
Xsi Features – User Service Configuration	Remote Office	No	
	BroadWorks Anywhere	No	
	Simultaneous Ringing	No	
	Caller ID Blocking	No	
	Call Forwarding Always	No	
	Call Forwarding Busy	No	
	Call Forwarding No Answer	No	
Xsi Features – Directories	Do Not Disturb	No	
	Enterprise Directory	No	
	Enterprise Common Phone List	No	
	Group Directory	No	
	Group Common Phone List	No	
	Personal Phone List	No	
Xsi Features – Call Logs	Search All Directories	No	
	Placed Calls	No	
	Received Calls	No	
	Missed Calls	No	
	All Calls	No	

BroadWorks Xtended Services Interface (Xsi) and BroadCloud IM&P Support Table			
Interface	Feature	Supported	Comments
	Sort by Name	No	
Xsi Features – Visual Voice Mail	View Messages	No	
	Listen to Audio Message	No	
	Watch Video Message	No	
	Mark Message Read/Unread	No	
	Delete Message	No	
	Mark All Messages Read/Unread	No	
Xsi Features – Push Notification	Register/Deregister for Push Notifications	No	
	Incoming Call via Push Notification	No	
	Call Update via Push Notification	No	
	Incoming Call via Push Notification; Second Incoming Call	No	
	MWI via Push Notification	No	
	Ring Splash via Push Notification	No	
Xsi Features – Call Recording Configurations	Call Record Mode Get	No	
	Set Record Mode	No	
	Set Play Call Recording to Start and Stop Announcement	No	
	Set Record Voice Messaging	No	
	Set Pause and Resume Notification	No	
	Set Recording Notification	No	
Xsi Features – Call Recording Controls	Record Mode set to Never	No	
	Record Mode set to Always	No	
	Record Mode set to Always with Pause/Resume	No	
	Start Recording Mid-Call with Record Mode set to On Demand	No	
	Start Recording During Call Setup with Record Mode set to On Demand	No	
	Perform User Initiated Start with Record Mode set to On Demand	No	
	Perform Mid-Call Start Recording after Placing Call on Hold	No	
	Perform Mid-Call Change to Call Recording Mode	No	
	Record Local Three-Way Call	No	
	Record Network Three-Way Call	No	

BroadWorks Xtended Services Interface (Xsi) and BroadCloud IM&P Support Table			
Interface	Feature	Supported	Comments
XMPP Features – Contact/Buddy List	Contacts	No	
	Favorites	No	
	Groups	No	
	Non-XMPP Contacts	No	
	Conferences	No	
XMPP Features – Presence	Login Invisible	No	
	Presence State	No	
	Presence Status	No	
	Contact's Presence State	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 2N issue, the issue number is from 2N'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		
		2.23.0.32.5		
HIP-4617	Session ID Changed during Session Audit. The session ID in the 200 OK SDP, which responds to BroadWorks session audit INVITE, is changed by the device. Workaround: None.	X		
HIP-4619	Maximum Registration Time Fails When the device sends a REGISTER with expiration timer greater than BroadWorks maximum registration time, BroadWorks return a 200 OK with expiration timer as maximum registration time. The next REGISTER sent by device use the maximum registration time value in 200 OK. It should use its own configured REGISTER expiration timer. Workaround: None.	X		

Issue Number	Issue Description	Partner Version			
		2.23.0.32.5			
HIP-5010	<p>Send SIP request to the Secondary BroadWorks.</p> <p>Intercom rarely register to the backup server. Issue happens with one of 2N DNS server.</p> <p>Workaround: Use different DNS server, such as Google DNS server.</p>	x			

3 BroadWorks Configuration

This section identifies the required BroadWorks device profile type for the 2N IP Intercoms as well as any other unique BroadWorks configuration required for interoperability with the IP Intercoms.

3.1 BroadWorks Device Profile Type Configuration

This section identifies the device profile type settings to use when deploying the 2N IP Intercoms with BroadWorks.

Create a device profile type for the 2N IP Intercoms with settings as shown in the following example. The settings shown are recommended for use when deploying the 2N IP Intercoms with BroadWorks. For an explanation of the profile parameters, see the *BroadWorks Device Management Configuration Guide* [2].

The device profile type shown provides the *Number of Ports* (number of SIP lines) setting for 2N IP Intercoms.

Model Name	Number of SIP Lines
2N® IP Audio Kit	2
2N® IP Base	2
2N® IP Force	2
2N® IP Safety	2
2N® IP Solo	2
2N® IP Uni	2
2N® IP Vario	2
2N® IP Verso	2
2N® IP Video Kit	2
2N® SIP Audio Converter	2
2N® SIP Speaker	2
2N® SIP Speaker Horn	2

Identity/Device Profile Type Modify

Modify an existing identity/device profile type.

OK Apply Delete Export Cancel

Identity/Device Profile Type: 2N_IP_Intercoms
Signaling Address Type: Intelligent Proxy Addressing
 Obsolete

Standard Options

Number of Ports: Unlimited Limited To

Ringback Tone/Early Media Support: RTP - Session
 RTP - Early Session
 Local Ringback - No Early Media

Authentication: Enabled
 Disabled

Hold Normalization: Unspecified Address
 Inactive
 RFC3264

Registration Capable Authenticate REFER
 Static Registration Capable Video Capable
 E164 Capable Use History Info Header
 Trusted

Advanced Options

Route Advance Forwarding Override
 Wireless Integration Conference Device
 PBX Integration Mobility Manager Device
 Add P-Called-Party-ID Music On Hold Device
 Auto Configuration Soft Client Requires BroadWorks Digit Collection
 Requires BroadWorks Call Waiting Tone Requires MWI Subscription
 Advice of Charge Capable Support Call Center MIME Type
 Support Emergency Disconnect Control Support Identity In UPDATE and Re-INVITE
 Enable Monitoring Support RFC 3398
 Static Line/Port Ordering Support Client Session Info
 Support Call Info Conference Subscription URI Support Remote Party Info
 Support Visual Device Management Bypass Media Treatment
 Support Cause Parameter

Reset Event: reSync checkSync Not Supported

Trunk Mode: User Pilot Proxy

Hold Announcement Method: Inactive Bandwidth Attributes

Unscreened Presentation Identity Policy: Profile Presentation Identity
 Unscreened Presentation Identity
 Unscreened Presentation Identity With Profile Domain

Web Based Configuration URL Extension:

Device Configuration Options: Not Supported Device Management Legacy

Figure 1 Device Identity/Profile Type

3.2 BroadWorks Configuration Steps

There are no additional BroadWorks configuration steps required.

4 2N IP Intercoms Configuration

This section describes the configuration settings required for the 2N IP Intercoms integration with BroadWorks, primarily focusing on the SIP interface configuration. The IP Intercoms 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 *2N® IP intercom Configuration Manual [1]* for IP Intercoms.

4.1 Configuration Method

The intercom can be configured through the device's web interface and configuration files auto provisioning. The web interface can be access through `https://<device IP address>`. The default login username is "admin", the default password is "2n".

The bulk configuration can be done via 2N® Access Commander.

Configuration Files

IP Intercoms Configuration Files	Level	Description
<code><model_prefix>-firmware.bin</code> Example: hipve-firmware.bin (for Verso)	System	Contains the device firmware load that apply to all devices of the same model.
<code><model_prefix>-common.xml</code> Example: hipve-common.xml (for Verso)	System	Contains configurable parameters that apply to all devices of the same model in a given deployment.
<code><model_prefix>-<MAC_address>.xml</code> Example: hipve-7C1EB302BCB8.xml (for Verso)	Subscriber	Contains configurable parameters that apply to an individual device in a deployment.

The configuration file for an individual device is downloaded after the common configuration file.

Models and their model prefixes

IP Intercoms Models	Model Prefix
2N IP Audio Kit	hipak
2N IP Force	hipf
2N IP Safety	hipsf
2N IP Solo	hipso
2N IP Vario	hipv
2N IP Verso	hipve
2N IP Video Kit	hipvk
2N SIP Audio Converter	sac
2N SIP Speaker Horn	sassh
2N SIP Speaker	ss

4.2 System Level Configuration

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

4.2.1 Configure Network Settings

Network setting of 2N IP Intercoms can be configured through its web interface, DHCP server (default method), or configuration file. The device can be found via 2N® Network Scanner.

After logging into the device through the web interface, go to *System* → *Network* screen to configure network setting.

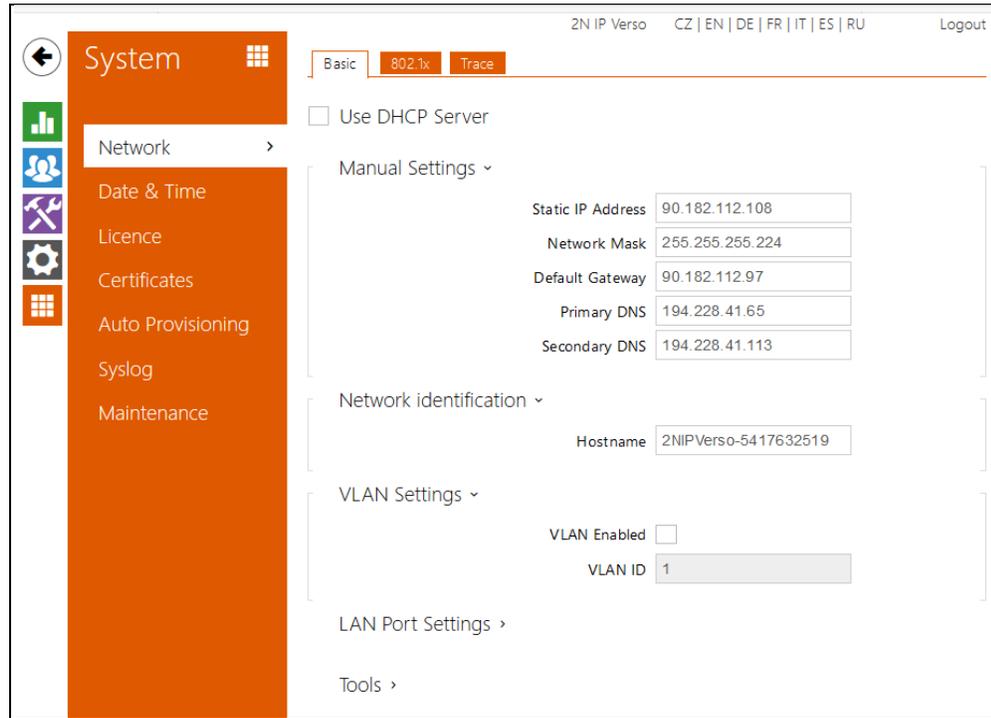


Figure 2 Network Setting

NTP server can be configured through the device's web interface (default server is time.nist.gov and default time zone is UTC0) or configuration file.

NTP server can be configure through *System* → *Data & Time* screen through its web interface.

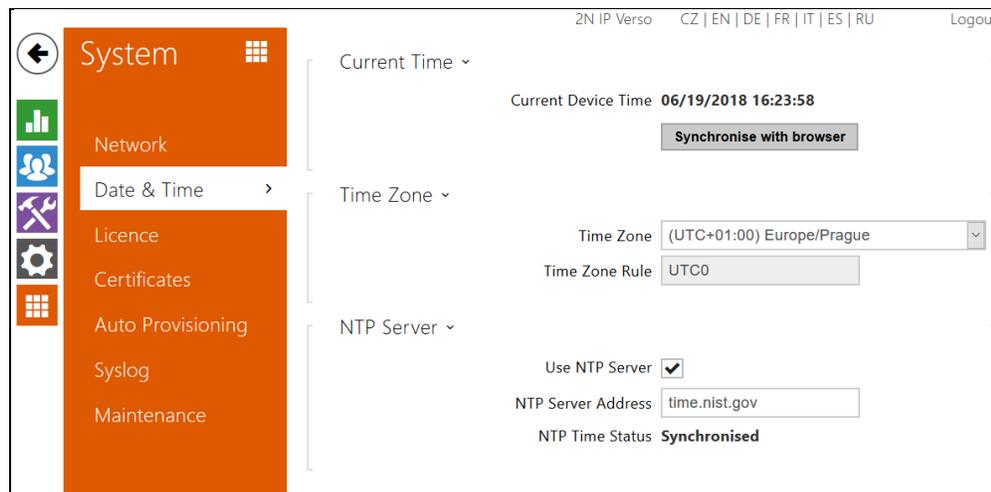
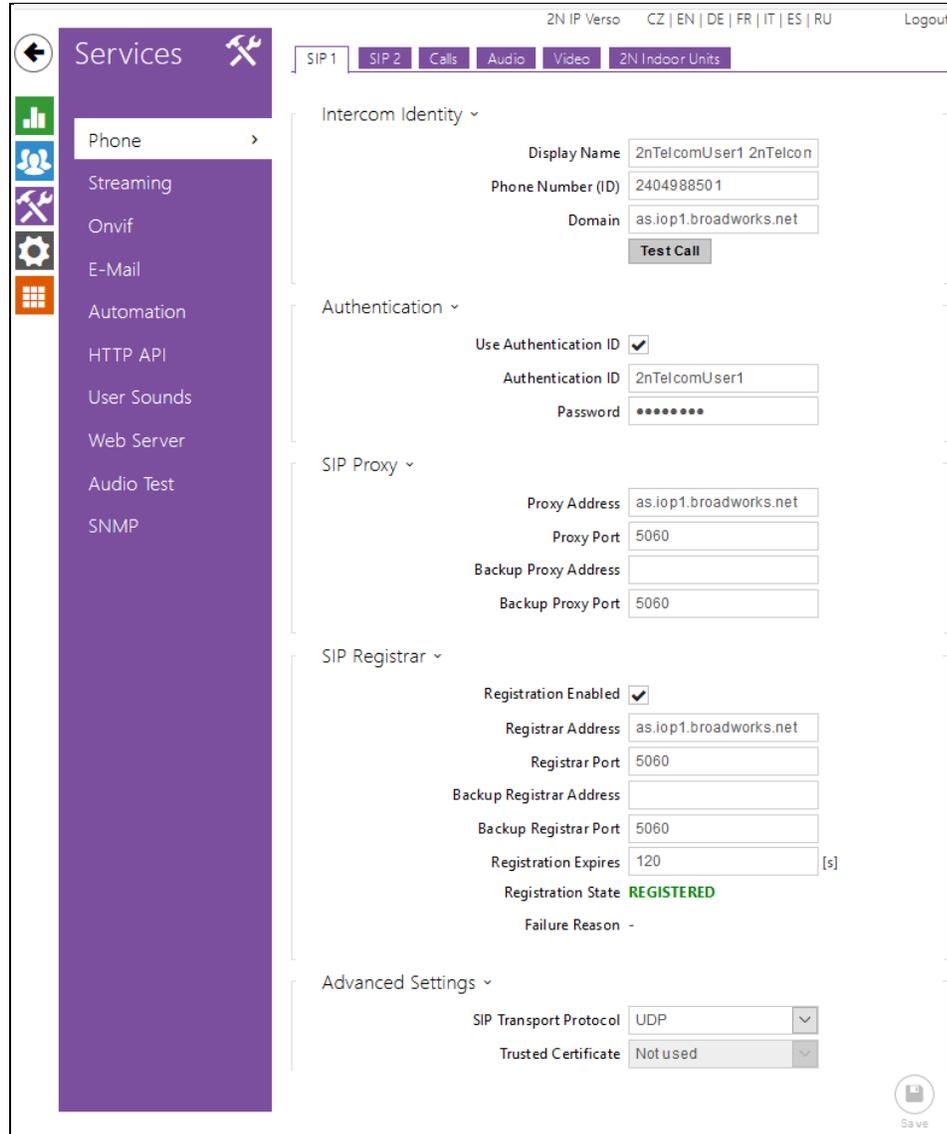


Figure 3 NTP Server Setting

4.2.2 Configure SIP Interface and Subscriber Settings

SIP Interface and Subscriber can be configured through the device's web interface or configuration file.

After logging into the device through the web interface, go to *Service* → *Phone* screen to configure SIP and subscriber setting.



The screenshot displays the 'Phone' configuration page for 'SIP 1'. The configuration is organized into several sections:

- Intercom Identity:**
 - Display Name: 2nTelcomUser1 2nTelcon
 - Phone Number (ID): 2404988501
 - Domain: as.iop1.broadworks.net
 - Test Call button
- Authentication:**
 - Use Authentication ID:
 - Authentication ID: 2nTelcomUser1
 - Password: [masked]
- SIP Proxy:**
 - Proxy Address: as.iop1.broadworks.net
 - Proxy Port: 5060
 - Backup Proxy Address: [empty]
 - Backup Proxy Port: 5060
- SIP Registrar:**
 - Registration Enabled:
 - Registrar Address: as.iop1.broadworks.net
 - Registrar Port: 5060
 - Backup Registrar Address: [empty]
 - Backup Registrar Port: 5060
 - Registration Expires: 120 [s]
 - Registration State: REGISTERED
 - Failure Reason: -
- Advanced Settings:**
 - SIP Transport Protocol: UDP
 - Trusted Certificate: Not used

A 'Save' button is located at the bottom right of the configuration area.

Figure 4 Phone Setting

Phone Number (ID): The field must match the user part of line/port configuration on BroadWorks.

Proxy Address: The field must match the domain part of line/port configuration on BroadWorks.

Registrar Address: The field must match the domain part of line/port configuration on BroadWorks.

Authentication ID: The field must match the Authentication User Name of the user configured on the BroadWorks.

Authentication Password: The field must match the Authentication Password of the user configured on the BroadWorks

4.2.3 Configure Service Settings

Users (the destination where the IP Intercoms calls) can be configured through the device's web interface or configuration file.

After logging into the device through the web interface, go to *Directory* → *Users* screen to configure the user setting.

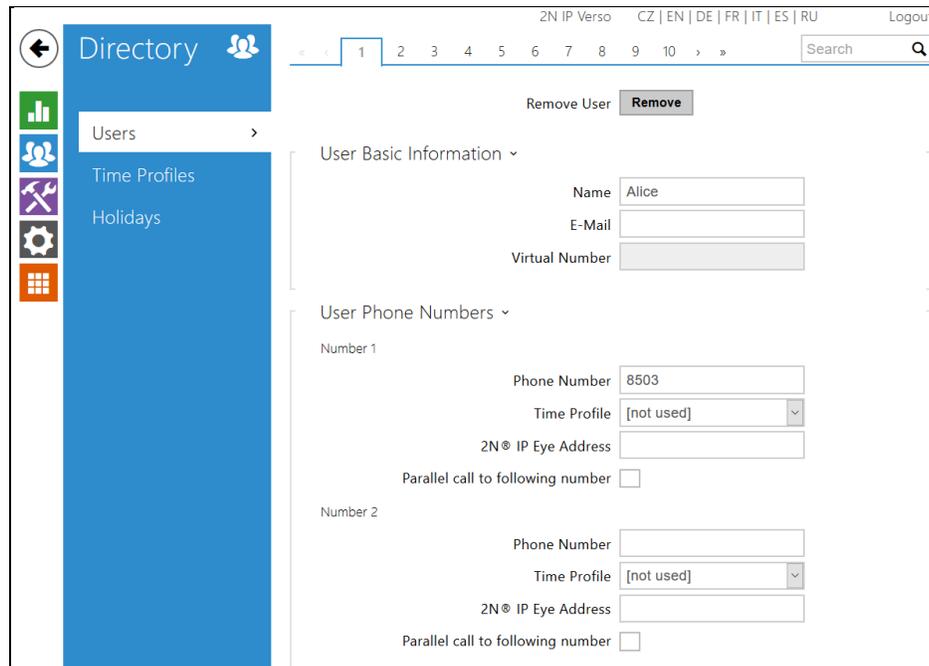


Figure 5 User Setting

Buttons to User assignment (this defines which user is called when the button is pressed) can be configured through the device's web interface or configuration file.

After logging into the device through the web interface, go to *Hardware* → *Buttons* screen to configure the button setting.

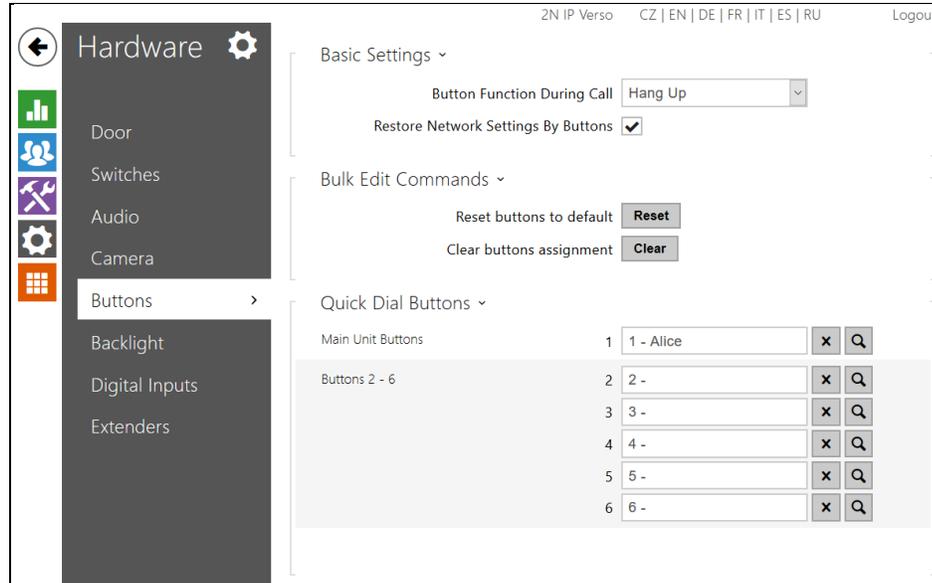


Figure 6 Button Setting

Switch Codes (DTMF signs pressed during the call to open the door) can be configured through the device's web interface or configuration file. Default code is 00*.

Switch Codes can be configured from Hardware → Switches screen.

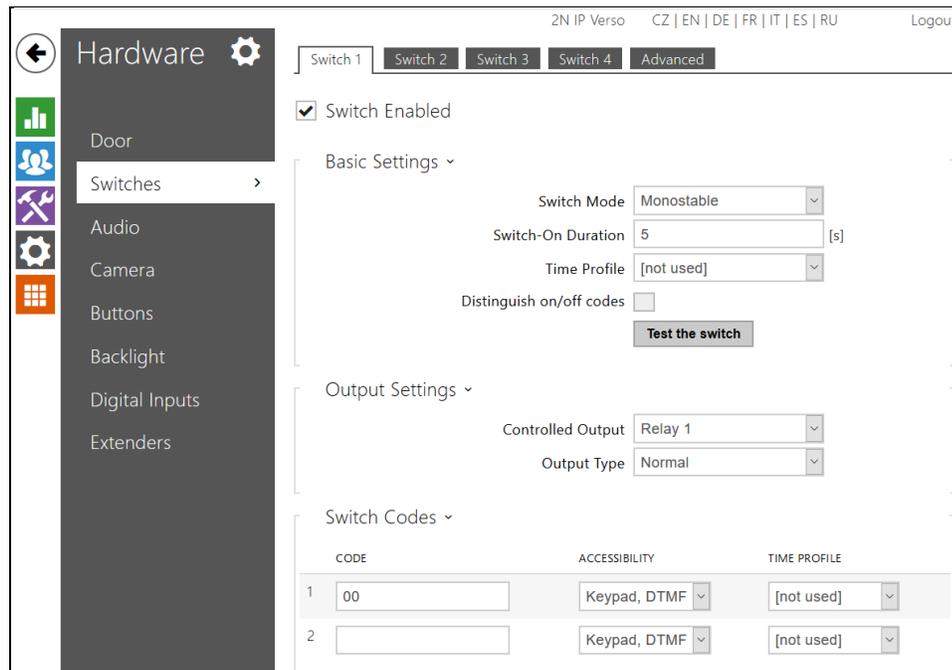


Figure 7 Switch Codes Setting

4.3 SIP Advanced Feature Configuration

This section provides configuration instructions for advanced SIP features supported by the phone including but not limited to Busy Lamp Field, Feature Key Synchronization, Call Center, Emergency Call, Advice of Charge, Call Recording, and Security Classification.

4.3.1 Busy Lamp Field Configuration

This feature is currently not supported by 2N IP Intercoms.

4.3.2 Feature Key Synchronization Configuration

This feature is currently not supported by 2N IP Intercoms.

4.3.3 Call Center Feature Configuration

This feature is currently not supported by 2N IP Intercoms.

4.3.4 Call Recording Feature Configuration

This feature is currently not supported by 2N IP Intercoms.

4.3.5 Security Classification Feature Configuration

This feature is currently not supported by 2N IP Intercoms.

4.3.6 Emergency Call Configuration

This feature is currently not supported by 2N IP Intercoms.

4.3.7 Advice of Charge Configuration

This feature is currently not supported by 2N IP Intercoms.

4.3.8 Conference Event Configuration

This feature is currently not supported by 2N IP Intercoms.

4.4 Xtended Services Interface (Xsi) Feature Configuration

This feature is currently not supported by 2N IP Intercoms.

4.5 Instant Message and Presence Configuration

This feature is currently not supported by 2N IP Intercoms.

5 Device Management

The BroadWorks Device Management feature provides the capability to automate generation of device configuration files to support mass deployment of devices. This section identifies the Device Management capabilities supported by the 2N IP Intercoms and the configuration steps required. For Device Management configuration details not covered here, see the *BroadWorks Device Management Configuration Guide* [2] and the *BroadWorks CPE Kit Usage Guide* [8].

5.1 Device Management Capabilities Supported

The 2N IP Intercoms has completed Device Management interoperability testing with BroadWorks using the *BroadWorks Device Management Interoperability Test Plan* [7]. The results are summarized in the following table.

The BroadWorks test plan is composed of packages, each covering distinct interoperability areas. 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 Device Management interface between the device and BroadWorks with the intent to ensure interoperability.

The *Supported* column in the following table identifies the 2N IP Intercoms' support for each of the items covered in the test plan packages, with the following designations:

- Yes Test item is supported
- No Test item is not supported
- NA Test item is not applicable
- 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 2N IP Intercoms.

Test Plan Package	Test Plan Package Items	Supported	Comments
HTTP File Download	HTTP Download Using XSP IP Address	No	
	HTTP Download Using XSP FQDN	No	
	HTTP Download Using XSP Cluster FQDN	No	
	HTTP Download With Double Slash	No	
HTTPS File Download	HTTPS Download Using XSP IP Address	No	
	HTTPS Download Using XSP FQDN	No	
	HTTPS Download Using XSP Cluster FQDN	No	
HTTPS File Download with	HTTPS Download with Client Authentication Using XSP FQDN	Yes	

BroadWorks Device Management Interoperability Test Plan Support Table			
Test Plan Package	Test Plan Package Items	Supported	Comments
Client Authentication	HTTPS Download with Client Authentication Using XSP Cluster FQDN	Yes	
Time Zone Mapping	Inspect Time Zone Setting	No	
Language Mapping	Inspect Language Setting	No	
File Inspection	Inspect System Config File	No	
	Inspect Device-Specific Config File	Yes	
	Inspect Other Config Files	No	
	Inspect Static Files	Yes	
Device Inspection	Inspect SIP Settings	Yes	
	Inspect Line Settings	Yes	
	Inspect Service Settings	No	
HTTP File Upload	HTTP Upload Using XSP IP Address	No	
	HTTP Upload Using XSP FQDN	No	
	HTTP Upload Using XSP Cluster FQDN	No	
Call Processing Sanity Tests	Register with Authentication	Yes	
	Call Origination	Yes	
	Call Termination	Yes	
	Remote Restart	No	
	Shared Line Origination	No	
	Shared Line Termination	No	
	Shared Line Status	No	
	Busy Lamp Field	No	
Flexible Seating	Association via Voice Portal	No	
	Association via Phone	No	
No Touch Provisioning	Provision via DHCP Options Field	Yes	Only supports part of DM URL.
	No Touch Provision via DM redirect	No	
	No Touch Provision via Vendor redirect	No	

5.2 Device Management Configuration

This section identifies the steps required to enable the 2N IP Intercoms for device management. For Device Management configuration details not covered here, see the *BroadWorks Device Management Configuration Guide* [2] and the *BroadWorks CPE Kit Usage Guide* [8].

5.2.1 Configure BroadWorks Tags

The template files in Device Management use tags to represent the data stored on BroadWorks. When a configuration changes for a user, Device Management parses the template files and replaces the Device Management tags with the associated data stored on BroadWorks. There are default tags defined in the Device Management software and there are custom tags that the service provider can create and define via the web portal for use by Device Management. There are two types of custom tags that can be defined: system-default tags that are common to all devices on the system and device type-specific tags that are common to 2N device models only.

The 2N IP Intercoms does not make use of either system default or device type-specific tags. A new tag set *2N_IP_Intercoms_Tags* is added from *System* → *Resources* → *Device Management Tag Sets* on BroadWorks without any tags configured.

5.2.2 Configure BroadWorks Device Profile Type

The device profile type is a system-level structure that defines how the device interfaces with BroadWorks. It also identifies the default configuration files and other files, such as firmware, which are required for the device to operate correctly. The device profile type is created by the system administrator. Group administrators use the device profile type to create a device profile. The device profile is an instance of the device profile type that is associated with a physical device.

There are two BroadWorks device profile configuration methods described: import and manual. The import method takes a DTAF as input and builds the BroadWorks device profile type(s) automatically. The manual method takes the administrator through the steps to manually add and configure the device profile type(s).

The import method should be used if all of the following prerequisites are met:

- The BroadWorks Release is 17.0 or later.
- The device profile type(s) being imported do not already exist on the system. (If either a previous import or manual configuration was done, then the import fails.)
- There is a DTAF file available for import with a BroadWorks release level that is the same as or prior to the release to which it is being imported. If the DTAF file is at a release level later than the release being imported to, then the import can fail.

Otherwise, use the manual method.

For more detailed instructions, refer to the *BroadWorks CPE Kit Usage Guide* [8] and the *BroadWorks Device Management Configuration Guide* [2].

5.2.2.1 Configuration Method 1: Import

This section identifies the steps necessary to make use of the Device Management import feature to configure BroadWorks to add the 2N IP Intercoms as a Device Management-enabled device type. Also, see the *BroadWorks CPE Kit Usage Guide* [8].

Download the 2N IP Intercoms CPE kit from BroadSoft Xchange at xchange.broadsoft.com. Extract the DTAF file from the CPE kit. These are the import files. Repeat the following steps for each model you wish to import.

- 1) Log in to BroadWorks as an administrator.
- 2) Browse to *System* → *Resources* → *Identity/Device Profile Types* and then click **Import**.
- 3) Select *Browse* to find the extracted DTAF file for *2N_IP_Intercoms* and then click **OK** to start the import.

After the import finishes, complete the following post-import configuration steps:

- 4) Browse to *System* → *Resources* → *Identity/Device Profile Types*.
- 5) Perform a search to find the imported 2N device profile type, *2N_IP_Intercoms*.
- 6) Browse to the *Profile* page and change the Device Management Device Access FQDN to your Xtended Services Platform (XSP) or XSP cluster address.
- 7) Change Device Access Port to the XSP HTTPS Interface port that supports Client Authentication.

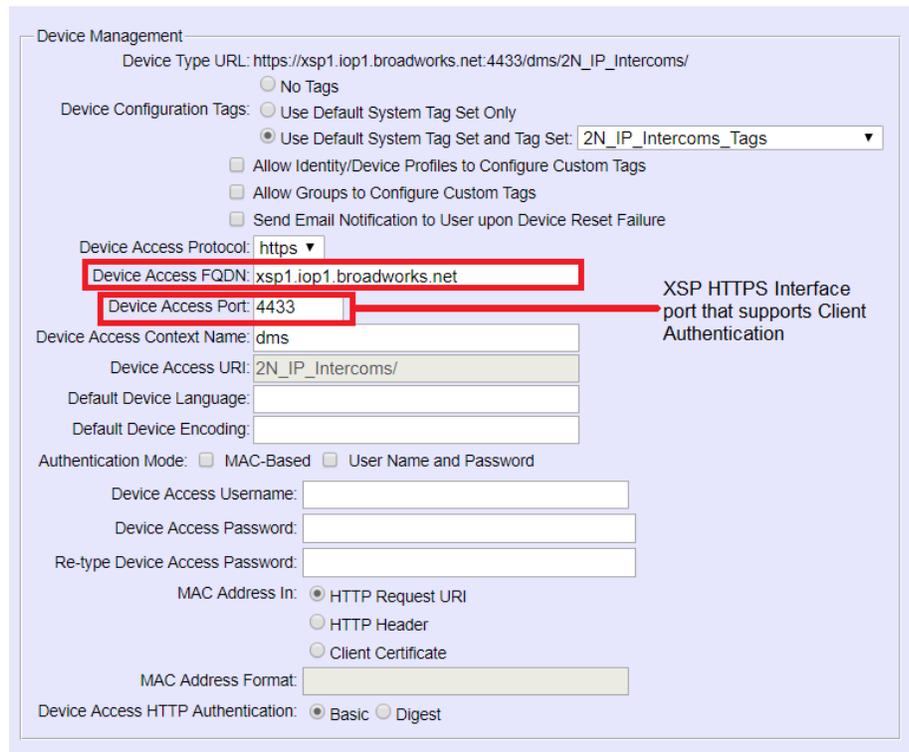


Figure 8 Device Access FQDN

- 8) Click the **Files and Authentication** link and then select the option to rebuild all the system files.

Firmware files must be obtained from 2N. These files are not included in the import. Complete the steps in section [5.2.2.2.2 Define Device Profile Type Files](#) to define the static firmware files and to upload the firmware.

NOTE: The non-firmware static files in section [5.2.2.2.2 Define Device Profile Type Files](#) are normally included in the import.

5.2.2.2 Configuration Method 2: Manual

This section identifies the basic steps necessary for an administrator to manually configure BroadWorks to add the 2N IP Intercoms as a Device Management-enabled device type. This method should not be used except in special cases as described in the opening to section [5.2.2 Configure BroadWorks Device Profile Type](#).

For more detailed instruction on manual configuration, refer to the *BroadWorks CPE Kit Usage Guide* [8] and the *BroadWorks Device Management Configuration Guide* [2].

The steps in this section can also be followed to update previously imported or configured device profile type(s) with new configuration files and firmware.

If there are DTAFs for more than one device model, these steps must be completed for each model.

5.2.2.2.1 Create or Modify Device Profile Type

This section identifies the BroadWorks device profile type settings relevant to Device Management for the 2N IP Intercoms.

Browse to *System* → *Resources* → *Identity/Device Profile Types* and perform a search to find the 2N device profile type created in section [3.1 BroadWorks Device Profile Type Configuration](#) or add the device profile type using the settings from section [3.1 BroadWorks Device Profile Type Configuration](#) if they do not exist.

Configure the device profile type *Signaling Address Type*, *Standard* and *Advanced* options settings to match the settings in section [3.1 BroadWorks Device Profile Type Configuration](#).

Configure the device profile type *Device Management* options as shown in section [5.2.2.1 Configuration Method 1: Import](#).

The following subsections identify the required settings specific to Device Management.

5.2.2.2.2 Define Device Profile Type Files

This section describes the BroadWorks Device Management configuration necessary to identify the configuration files and other files that the 2N IP Intercoms downloads.

Configuration templates and firmware that the IP Intercoms uses must be uploaded to BroadWorks. Download the 2N IP Intercoms CPE kit from BroadSoft Xchange at xchange.broadsoft.com. Extract the configuration files from the *Configuration Files* folder of CPE kit. Obtain the firmware files directly from 2N.

The following table identifies the 2N configuration files distributed with the 2.22.0.31.8 CPE kit.

File Name	CPE Kit Template File Name	File Type	Description
Examples			
<model_prefix>- %BWMACADDRESS SS%.xml	<model_prefix>- %BWMACADDRESS%.xml. template	Device-specific	This file contains all configuration that the device needs to load.

The following table identifies other files that the 2N IP Intercoms downloads from the server or uploads to the server. These files are not provided in the CPE kit and must be obtained from 2N.

File Name	File Type	Description
<model_prefix>-firmware.bin	Static	The file contains the firmware load.

Browse to *System* → *Resources* → *Identity/Device Profile Types* → *Files and Authentication* to add the files as described in the following subsections.

5.2.2.2.2.1 <model_prefix>-%BWMACADDRESS%.xml

Add the <model_prefix>-%BWMACADDRESS%.xml file to the device profile type with the settings shown in [Figure 9](#).

After creating the device profile type file, upload <model_prefix>-%BWMACADDRESS%.xml , which is extracted from the CPE kit. Use the **Browse** button on the file definition screen. Be sure to click **Apply** after uploading the file.

Device Access File Format: hipve-%BWMACADDRESS%.xml

Repository File Format: hipve-%BWFQDEVICEID%.xml

Access File: [https://xsp1.iop1.broadworks.net:4433/dms/2N_IP_Intercoms/hipve-
{%25BWMACADDRESS%25}.xml](https://xsp1.iop1.broadworks.net:4433/dms/2N_IP_Intercoms/hipve-
{%25BWMACADDRESS%25}.xml)
Note: this URL has undefined content. Validate it manually by replacing any content between {} with valid value(s).

Repository File:
Template File: [Download](#)

File Category: Static Dynamic Per-Type Dynamic Per-Device

File Customization: Administrator and User ▼

Allow Upload from Device

Extended File Capture

Default Extended File Capture Mode

[Enable for All File Instances](#) [Disable for All File Instances](#)

Assign File

Manual

Custom

Upload File: Choose File No file chosen

Currently using /var/broadworks/lpDeviceConfig/type/2N_IP_Intercoms/hipve-
configuration file: %BWMACADDRESS%.xml.template

```
<?xml version="1.0" encoding="UTF-8"?>
<DeviceDatabase Version="16">
<Phone>
  <Sip At="0">
    <Client>
      <Domain>%BWHOST-1%</Domain>
    </Client>
    <Proxy>
      <Address>%BWHOST-1%</Address>
    </Proxy>
  </Sip>
</Phone>
```

File Authentication

Authentication Mode: MAC-Based User Name and Password

MAC Address In: HTTP Request URI

HTTP Header

Client Certificate

MAC Address Format:

Device Access HTTP Authentication: Basic Digest

Allowed Access Protocols: http https tftp

Figure 9 hipve-%BWMACADDRESS%.xml File Settings

5.2.2.2.2 <model_prefix>-firmware.bin

Add the <model_prefix>-firmware.bin file to the device profile type with the settings shown in [Figure 10](#).

After creating the device profile type file, upload <model_prefix>-firmware.bin, which is obtained from 2N. Use the **Browse** button on the file definition screen. Be sure to click **Apply** after uploading the file.

Device Access File Format: hipve-firmware.bin
 Repository File Format: hipve-firmware.bin
 Access File: https://xsp1_iop1_broadworks.net:4433/dms/2N_IP_Intercoms/hipve-firmware.bin
 Repository File:
 Template File:
 File Category: Static Dynamic Per-Type Dynamic Per-Device
 File Customization:
 Enable caching

Assign File

Manual
 Custom
 Upload File: No file chosen

File Authentication

Authentication Mode: MAC-Based User Name and Password
 MAC Address In: HTTP Request URI
 HTTP Header
 Client Certificate
 MAC Address Format:

Device Access HTTP Authentication: Basic Digest
 Allowed Access Protocols: http https tftp

Figure 10 hipve-firmware.bin

5.2.3 Create Device Profile Instance

The previous sections defined the device profile type such that the system is ready to mass deploy device profiles. A device profile is an instance of the device profile type and defines the BroadWorks interface to an individual 2N device.

Browse to the BroadWorks <group> → Resources → Identity/Device Profiles page and then select **Add** to add a new 2N IP Intercoms device profile. Configure the device profile as shown in the [Figure 11](#) example.

Identity/Device Profile Modify

Modify or delete an existing group identity/device profile.

OK
Apply
Delete
Cancel

Profile
Users
Files

Identity/Device Profile Name: Solo_2
 Identity/Device Profile Type: 2N_IP_Intercoms
 Device Type URL: https://xsp1.iop1.broadworks.net:443/dms/2N_IP_Intercoms/
 Protocol: SIP 2.0 ▾
 Host Name/IP Address: Port:
 Transport: Unspecified ▾
MAC Address: 7C1EB3021C3C
 Serial Number:
 Description:
 Outbound Proxy Server:
 STUN Server:
 Physical Location:
 Lines/Ports: 2
 Assigned Lines/Ports: 1
 Unassigned Lines/Ports: 1
 Version: 2N IP Solo 2.23.1.32.10

Authentication

Use Identity/Device Profile Type Credentials
 Use Custom Credentials

* Device Access User Name:

* Device Access Password:

* Re-type Device Access Password:

Figure 11 Device Profile Instance

5.2.4 Configure BroadWorks User

Configure the user with the desired BroadWorks configuration and services. Any services that require a specific configuration on the device are managed via Device Management and are defined in the device configuration files, if the template files are created with the correct Device Management tags.

The device profile created in the previous section must be assigned to the BroadWorks user. Assigning the device profile to the user automatically causes the Device Management feature to generate the device configuration files for this user's device.

To assign the device profile to the user, browse to the BroadWorks <user> → *Addresses*.

5.2.5 Configure 2N IP Intercoms

This section describes the steps necessary to configure the 2N IP Intercoms to integrate with BroadWorks Device Management.

5.2.5.1 Manually Defining Device Management File Access URI

From web browser, go to <https://< IP address of the Intercom >>. The default login username is *admin*, the default password is *2n*. After login into the device, click on *System* → *Auto Provisioning* → *Configuration* screen. Configure the *Address Retrieval Mode*, *Server Address*, *File Path* and *User Certificate* parameters. Afterwards, click the button **Apply & update**.

Parameters	Value	Description/Notes
Address Retrieval Mode	Manual Settings	
Server Address	Example: https://xsp1.iop1.broadworks.net	The BroadWorks URL server part for the phone to download DM files.
File Path	Example: /dms/2N_IP_Intercoms/	The BroadWorks URL file part for the phone to download DM files.
User Certificate	Factory Cert	Certificate to validate the intercom with BroadWorks

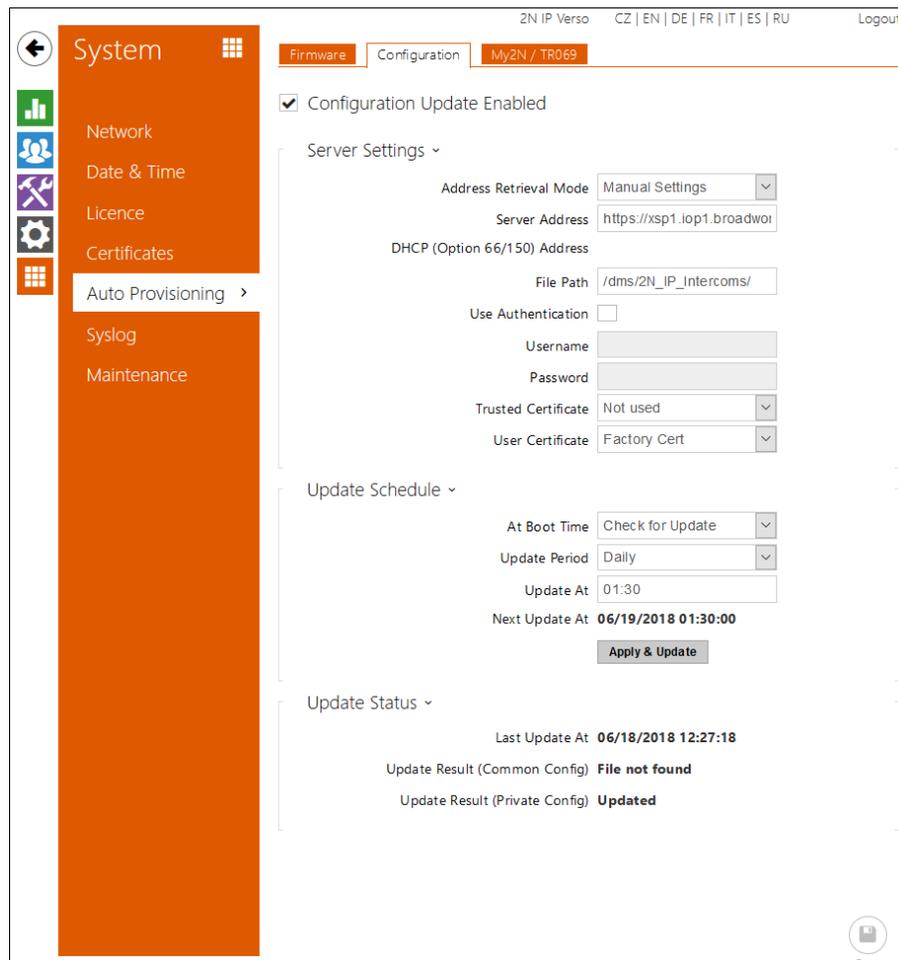


Figure 12 Defining Device Management File Access URI

5.3 Upgrade from Previous CPE Kits

The previous configuration sections are primarily structured around importing or manually configuring the 2N device profile types for the first time. Many of the steps are unnecessary when upgrading to a new firmware release or CPE kit version.

For general instructions on upgrading, see the *BroadWorks CPE Kit Usage Guide* [\[8\]](#).

Appendix A: Reference IP Intercoms Configuration Files

The following is a reference configuration for the IP Intercoms configured for use with BroadWorks.

The full example of the configuration file can be downloaded the device's web interface.

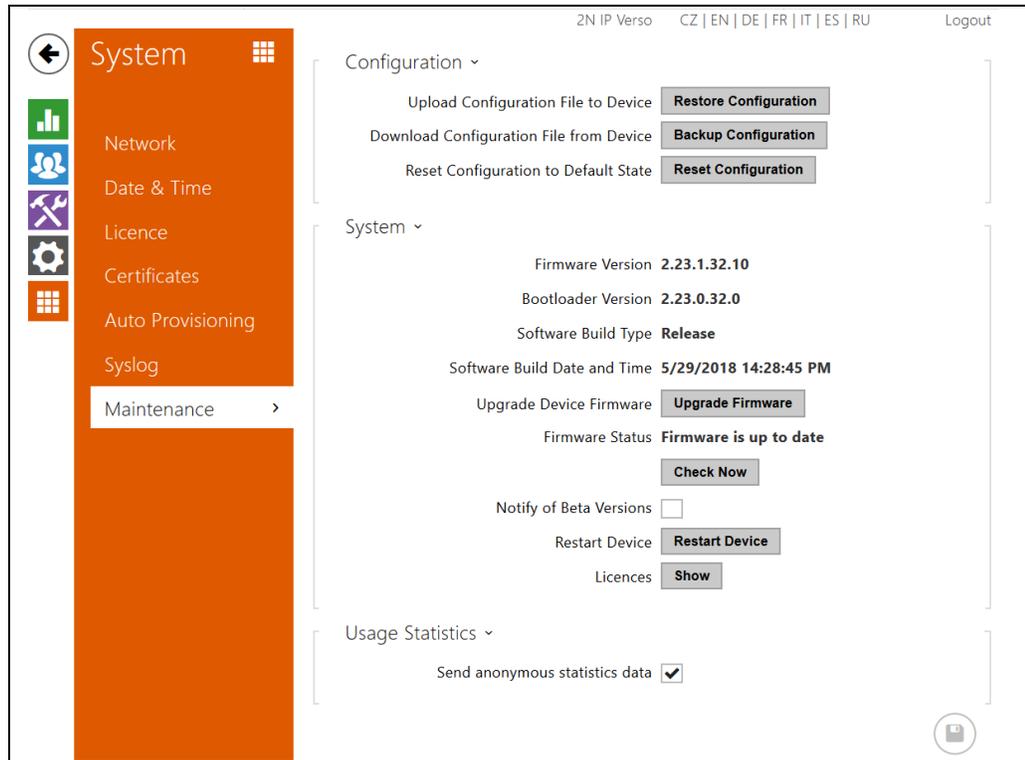


Figure 13 Maintenance Configuration

The intercom downloads the system-wide configuration file `<model_prefix>-common.xml` and then the device specific file `<model_prefix>-<MAC_address>.xml`.

Only the device specific file is downloaded from BroadWorks.

Parameters not defined in the configuration are not changed. It does not matter whether the parameter is in the common file or the device specific file. The parameters defined in the device specific file have priority.

NOTE: This is an example file and it should be used for reference only.

```
<?xml version="1.0" encoding="UTF-8"?>
<DeviceDatabase Version="16">
<Phone>
  <Sip At="0">
    <Client>
      <Domain>as.iop1.broadworks.net</Domain>
    </Client>
    <Proxy>
      <Address>as.iop1.broadworks.net</Address>
    </Proxy>
  </Sip>
</Phone>
```

```
<Registrar>
  <Enabled>1</Enabled>
  <Address>as.iopl.broadworks.net</Address>
</Registrar>
<User>
  <DisplayName>2nTelcomUser1 2nTelcomUser1</DisplayName>
  <Id>2404988501</Id>
  <AuthId>2nTelcomUser1</AuthId>
  <PasswordString>password1</PasswordString>
  <UseAuthId>1</UseAuthId>
</User>
</Sip>
</Phone>
</DeviceDatabase>
```

References

- [1] 2N®. 2018. 2N® IP intercom Configuration Manual, Version 2.23. Available from 2N at wiki.2n.cz.
- [2] BroadSoft, Inc. 2018. *BroadWorks Device Management Configuration Guide, Release 22.0*. Available from BroadSoft at xchange.broadsoft.com.
- [3] BroadSoft, Inc. 2017. *BroadWorks Redundancy Guide, Release 22.0*. Available from BroadSoft at xchange.broadsoft.com.
- [4] BroadSoft, Inc. 2018. *BroadWorks SIP Access Interface Interworking Guide, Release 22.0*. Available from BroadSoft at xchange.broadsoft.com.
- [5] BroadSoft, Inc. 2018. *BroadWorks SIP Phone Interoperability Test Plan, Release 22.0*. Available from BroadSoft at xchange.broadsoft.com.
- [6] BroadSoft, Inc. 2018. *BroadWorks SIP Phone Xsi and XMPP Test Plan, Release 22.0*. Available from BroadSoft at xchange.broadsoft.com.
- [7] BroadSoft, Inc. 2018. *BroadWorks Device Management Interoperability Test Plan, Release 22.0*. Available from BroadSoft at xchange.broadsoft.com.
- [8] BroadSoft, Inc. 2017. *BroadWorks CPE Kit Usage Guide, Release 22.0*. Available from BroadSoft at xchange.broadsoft.com.