OXO CONNECT

Hybrid-Cloud platform for SMBs

Rainbow™

Alcatel·Lucent Enterprise

OXO Connect

Expert Documentation: System Services

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Alcatel·Lucent Enterprise

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- 2014/53/EU for radio equipment
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- 2011/65/EU (RoHS)
- 2012/19/EU (WEEE)

Expert Documentation: System Services

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1

Expert Documentation structure

The Expert Documentation is split into fifteen separated documents, listed in the table below.

Expert Documentation describes the features supported by OXO Connect RC2.0* or higher.

* RCz.n, with z greater than or equal to 2, stands for any release starting from 2016 introducing Connect capabilities.

It appears:

*   On product stickers with release format: RC0zn/xx.yy
*   In any documentation (including this one) as: Rz.n

Please refer to the OXO Connect Documentation Note, for historical information. In addition, the Cross Compatibility document is the reference for detailed status about supported and unsupported devices and applications.

table 1.1: Expert documentation structure

	Documentation title	Part number
[1]	Expert Documentation: General Presentation This document contains general information on OXO Connect, such as a brief description of services provided, platform hardware, handsets and user applications available, limits, compatibility with standards, environmental constraints.	8AL91200USAM
[2]	Expert Documentation: Hardware: Platform, interfaces and devices This document covers all hardware aspects related to OXO Connect: this includes description of platforms (racks), boards, sets and complementary equipment such as additional modules or interface modules. This document also contains commissioning procedures for sets.	8AL91201USAM
[3]	Expert Documentation: User Services This document gives the presentation and configuration procedure of features available for end-users. The final chapter of the document synthesizes features availability according to the type of device or application.	8AL91202USAM
[4]	Expert Documentation: Voice Mail This document details the integrated voice mail system and automated attendant (general description, management, services available for end-users), as well as the configuration procedure to connect an external voice mail unit.	8AL91203USAM

Chapter 1 *Expert Documentation structure*

	Documentation title	Part number
[5]	Expert Documentation: Mobility This document contains a detailed description of mobility services available on OXO Connect. This includes useful information to deploy an IBS DECT, PWT, IP-DECT or xBS infrastructure, the description of associated base stations and handsets, and necessary information to implement OpenTouch Conversation clients. *Note:* *This document does not cover VoWLAN.*	8AL91204USAM
[6]	Expert Documentation: VoIP Services This document describes VoIP protocols supported by OXO Connect (such as SIP), configuration procedure of private or public access through IP links, as well as dimensioning and maintenance basic information.	8AL91205USAM
[7]	Expert Documentation: Private Networks This documentation gives a description of architectures and protocols (such as SVPN, QSIG) supported for a private network, a description of ARS, metering, clock synchronization, and the configuration procedure of accesses.	8AL91206USAM
[8]	Expert Documentation: General Applications This document gives a description of various applications available on OXO Connect, such as Hotel, Call metering, CTI, doorphones, Network management center, point-to-point/point to multipoint T0, permanent logical link, multiple automated attendant, multiple entities, PIMphony, PIMphony Touch.	8AL91207USAM
[9]	Expert Documentation: Web-Based Tool This document describes the Web-Based Tool, which is the integrated monitoring tool of OXO Connect.	8AL91208USAM
[10]	Expert Documentation: OmniTouch Call Center Office This document provides the description and installation procedure of OmniTouch Call Center Office. The document also includes presentation and operation of Announcement, Traceability, and a short description of Agent, Statistics and Supervisor applications.	8AL91209USAM
[11]	Expert Documentation: Management Tools This document describes the management tool available for OXO Connect(OMC). The document describes the OMC installation procedure, the different types of access between OMC and OXO Connect (local, remote, with or without proxy), the software installation procedure of OXO Connect via OMC and the list of services that can be managed by OMC.	8AL91210USAM

Chapter 1 *Expert Documentation structure*

	Documentation title	Part number
[12]	Expert Documentation: Maintenance Services This document contains basic information concerning the maintenance of your OXO Connect. This includes a diagnosis methodology in case of system or terminal(s) failure, the list of system messages, procedure to save/restore data, procedure to stop/restart your system, to replace CPU, boards and sets.	8AL91211USAM
[13]	Expert Documentation: Security This document gives essential information to secure your OXO Connect. This includes deployment guide for certificate, management of passwords, management of accesses to services from LAN/WAN and network configuration for remote accesses.	8AL91212USAM
[14]	Expert Documentation: System Services This document gives information about software keys, including their complete list. The document also describes operation of OXO Connect with NTP (as client or server) and the configuration of the embedded DHCP server.	8AL91213USAM
[15]	Glossary This document contains a glossary of general telecommunications terms as well as specific terms related to OXO Connect.	8AL91214USAM
[16]	Server Deployment Guide for Remote Workers using DeskPhones	8AL90345ENAA

In the present document, cross-references are identified by the number in the first column of the above table.

Part numbers are given in the last column.

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Chapter

2   *Software keys*

2.1 Services provided

2.1.1 Description

In the OXO Connect system, a software key is represented by an alphanumeric string of characters, which opens functions. Two types of software keys correspond to each OXO Connect system:

- the **MAIN software key** for the system functions (voice, Internet, etc.)
- the **CTI Software key** (including the **Try and Buy keys**) for the CTI functions

The software key corresponds to a text file where the name is the CPU hardware number with the **.MSL** (MAIN key) or **.CSL** (CTI key) extension.

Example: file 000068DA.msl and 000068DA.csl for main CPU no. 000068DA.

Each system needs the Main and CTI Software keys even if no CTI application is used on the system.

The systems can be delivered with a key that is already personalized for the client. The Distributor needs to load, if necessary, the personalized key on the non-factory-configured systems.

Service limits in the software key are subject to the hardware limitations of the client's configuration.

Try and Buy only apply to the CTI aspects.

When first initialized, the PIMphony Pro and PIMphony Team applications are available to every user.

The integrated TAPI 2.0 is also available.

As soon as one Try and Buy license is used, the countdown starts. The license will last 60 days.

After the 60 days, only the services defined in the CTI Software key are available.

2.1.2 Configuration

Keys must be downloaded in the event of CPU replacement or modifications to improve the system features.

However, the installation can be adapted to meet new needs when the system is in place by entering a new software key:

- By OMC (Expert View): **Modification Typical -> System -> Software key**

Two software keys must be entered: one for the system functionality (Main key, 42 to 138 characters), the other for CTI functionality (CTI key, 17 to 161 characters).

Keys consist of:

- all upper-case letters except I and O
- all digits except 1 and 0
- the special characters #, $, /, %, &, *, +, @,(and)

Note:
The software key must not contain a carriage return or space bar at the end of the key.

In some cases it is necessary to do a warm reset to activate the new key. A message is displayed for doing this reset.

Chapter	**2**	*Software keys*

Note:
In OMC, the values contained in the key are displayed in the first column "Authorized by software key" and the functions that are really open are displayed in the second column "Really activated". Since the equipment has no influence on the CTI functions, a single display column is available.

2.1.3 Software key control on the system

On starting up the system, different cases are possible:

- **The services needed by the customer are open and work properly:** the software key present on the system is correct.
- **The services needed are not open**
- **The key is valid but some services are not open** (verify using OMC).

  - Verify that the order meets the client's needs. If not, contact the orders" department. A new software key needs to be created including the new features.
  - When loading the key via OMC a warning message is displayed. In this case the services may be limited due to insufficient memory or CPU power.
- **The software key present on the system is not correct:**

  - The software key syntax is correct but it does not match the CPU's serial number. The system functions correctly with all its services for 30 days. A message "Software Key problem" is displayed on the Attendant station. Press the Alarm key to show the expiry date. When loading a correct key (valid CPU serial number) during this period, the system state is normal. If no correct key is loaded after 30 days, the system will restart in limited state with only sets belonging to the Operator group working, all other sets being out of service; the "Software Key problem" is displayed on the operator station.
  - The software key syntax is incorrect. The system starts in limited mode. When loading the correct Software key (with the correct serial number), the system restarts with all services working.
- **The software key syntax is correct, but the software key does not match the system's software release** (see:). The system functions correctly with all its services for 30 days.
- **The software key syntax is correct, the software release is correct but a more recent key has already been entered on this system and it is not possible to revert to a previous key**. The system functions correctly with all its services for 30 days.

Remark:
For a system in limited mode, when a valid software key is loaded, the system restarts with all its services.

2.1.4 Control of the software version

Each key work with a specific system software version.

This mechanism concerns only the "major" versions: R2, R3, R4, R5, etc.

If the key version does not correspond to the system software version, the system reinitializes in limited mode.

When entering a key by OMC, if the software version is not correct, OMC signals it and requests confirmation.

2.1.5 Edition number and acknowledgement code

The edition number is incremented with each implementation of a new key on a specific installation.

The acknowledgement code is indicated in message 34 (bytes 2 and 3) of the history messages table.

When a key is provided by Alcatel-Lucent Enterprise and is implemented in the system, this procedure is irreversible.

It is possible to reload a previous key but the system reinitializes in limited mode.

2.1.6 Procedure in case of problem

To obtain a key corresponding to the main CPU, you must contact Alcatel-Lucent Enterprise. Specify if the system was delivered with a software key corresponding to the CPU but does not work. If the client's main CPU has been changed, indicate the old and new CPU numbers.

2.2 Detailed description

2.2.1 Services controlled by the "Main" software key

The following table lists the functions controlled by the "Main" software key. If a software key is not present in the system, or is incorrect, the system starts in a limited state. The table also gives the limited state service levels, the granularity of upgrades, the maximum service level for each service, and if a hardware extension exists.

Service controlled or license name	Relevant software version of OXO Connect	Default state	Granularity	Max	Hardware extension
Universal User Terminals					
Number of UTL	From R2.0 (PowerCPU EE only)	2	+ 1	300	No
Number of Hot Desking users	From R2.0 (PowerCPU EE only)	0	+ 1	200	No
Mobility					
Number of OTCV applications	From R2.0 (PowerCPU EE only)	0	+1	50	No
System Services					
ISVPN ISDN (Need ARS)	From R2.0	closed		1	No
QSIG + (Need ARS)	From R2.0	closed		1	No
Number of Meet-me Conferences	From R2.0	0	+1	1	No
Metering tickets for NMC	From R2.0	0	+ 1000	30000	Yes
Fax switching	From R2.0	closed		1	No
CL	From R3.0	0		101	No

Service controlled or license name	Relevant software version of OXO Connect	Default state	Granularity	Max	Hardware extension
Networking					
Number of B channels (private netw.)	From R2.0	0	+1	120	No
Number of B channels on MIX boards (public netw.)	From R2.0	0	+2	120	No
Web Application					
Services over IP					
Number of VoIP channels	From R2.0 and up to R2.2 (PowerCPU EE only)	Closed		82	Yes
Number of VoIP trunks channels	From R2.0 (PowerCPU EE only)	Closed		82	Yes
Number of Open SIP phones	From R2.0 (PowerCPU EE only)	0	+1	300	No
Voice Mail & Automated Attendant					
Number of Voice Mail ports	From R2.0	0	+1	8	No
Voice mail Storage capability	From R2.0 (PowerCPU EE only)	60'	+10'	200 h	No
Automated Attendant	From R2.0	closed		1	No
Enhanced Automated Attendant	From R2.0	0	+1	5	No
Audiotext	From R2.0	closed		1	No
Distribution lists	From R2.0	closed		1	No
Record on Line	From R2.0	closed		1	No
Greetings & MOH					
Number of greetings msg (16")	From R2.0	4 msg	+ 4	20	No
Length of customized MOH	From R2.0	2'	+2'	10'	No

Service controlled or license name	Relevant software version of OXO Connect	Default state	Granularity	Max	Hardware extension
MOH : number of entities	From R2.0	1	+1	4	No
ACD					
Number of groups	From R2.0	0	+8	8	No
Number of active agents	From R2.0 (PowerCPU EE only)	0	5,10, 20 or 32 agents	32	No
statistic module	From R2.0	closed		1	No
Number of PC agent (DAM)	From R2.0 (PowerCPU EE only)	0	0,10, 20 or 32 agents	32	No
Number of supervisor applications	From R2.0	0	+1	4	No
SCR	From R2.0	closed		1	No
SWL (Software License) management					
SWL Version	From R2.0	0		10	
SWL Edition number	From R2.0	0		FFFF	
SWL Acknowledge code	From R2.0	0		FFFF	
eLP					
Engine		IGNORED BY THE SYSTEM			
EngineBis		IGNORED BY THE SYSTEM			
Checker_syst_solution		IGNORED BY THE SYSTEM			
Checker_cs_type		IGNORED BY THE SYSTEM			
Checker_oxo_01		IGNORED BY THE SYSTEM			
Product		IGNORED BY THE SYSTEM			
Cloud Solution status		IGNORED BY THE SYSTEM (transmitted to OMC for display)			
Serv. Assurance period		IGNORED BY THE SYSTEM (transmitted to OMC for display)			

Service controlled or license name	Relevant software version of OXO Connect	Default state	Granularity	Max	Hardware extension
Serv. Assurance validity date		IGNORED BY THE SYSTEM (transmitted to OMC for display)			

The following sections give explanations about how the licenses affect the OXO Connect.

Note:

There are deprecated licenses which do not correspond to a commercial item in eLP. Active deprecated licenses contribute to the services level. They have a fixed value and are used to open definitively a service. The system always tests them and opens the service accordingly.

The following table provides the active deprecated licenses:

Service controlled or license name	*Relevant OXO Connect software version*	*Default state*	*Fixed value*
System Services			
ARS	*R2.0*	*0*	*1*
DISA / DISA Transit	*R2.0*	*0*	*1*
Number of languages	*R2.0*	*2*	*4*
LDAP service	*R2.0*	*0*	*1*
Services over IP			
Call accounting over IP	*R2.0*	*0*	*1*
Voice Mail & Automated Attendant			
Mailbox greetings	*R2.0*	*0*	*1*
Remote customization	*R2.0*	*0*	*1*

2.2.1.1 Number of Universal Telephony License (UTL)

The UTL license controls the creation of the following phone devices:

- Analog phones
- DECT handsets connected to IBS-DECT or xBS
- Digital Premium DeskPhones
- IP DeskPhones
- SIP phones
- Softphones: IP Desktop Softphone, PIMphony IP
- SIP companions
- DECT handsets connected to IP-DECT
- OpenTouch Conversation with/without VoIP
- Virtual terminals with nomadic mode to external phone (i.e. **AnyDevice** in OMC)

- Open SIP phones
- Rainbow clients as main device for users (configured as **AnyDevice** in OMC)

OMC, in on-line or off-line mode, allows the creation of a phone device only if a UTL license is still available.

Rainbow clients as secondary set of multi-set (configured as **Free Rainbow in Twinset** in OMC) do not require any UTL license.

2.2.1.2 Number of Hot desking users license

A Hot Desking user must be created to be able to use the Hot Desking sets.

OMC does not allow the creation of a new Hot Desking user if the number of such users has reached the maximum value indicated by the license Hot Desking.

2.2.1.3 Number of OTCV license

OpenTouch Conversation requires two licenses:

- 1 UTL license
- 1 OTCV license

OMC does not allow the creation of a new OpenTouch Conversation subscriber if one of these two licenses is not available

2.2.1.4 Number of metering tickets for NMC license

This license defines the maximum number of metering tickets that can be sent to the NMC.

2.2.1.5 Fax switching license

This license is a global flag (opened/closed). If opened, it allows to route the fax incoming call to the fax device. If closed, the call is routed to the voice set.

2.2.1.6 Compatibility Level (CL)

This license specifies the device compatibility list used on the OXO Connect.

The following table displays the `COMPATIBILITY_LEVEL` values and the corresponding device compatibility lists available as of R3.0.

`COMPATIBILITY_LEVEL` value	Device compatibility list used on PBX
101	L101 (Full)
1	L1 (Limited)
2	L2 (Limited OBS)
0	L0 (Default)

The default list (L0) is used on the following cases:

- A PBX goes in DEFAULT state
- There is no C_L license in the "Main" software key
- There is a C_L license in the "Main" software key, but with an unexpected value (that is a value different from those of the table above)

2.2.1.7 Number of B channels license

This license is used to control the number of B-channels dedicated to DTL (Digital Tie Line), i.e. to private networking.

2.2.1.8 B channels on MIX boards license

We count the number of B-channels on MIX boards to accept MIX boards in the limit allowed by the license. This means that when a MIX board appears and all B-channels allowed by license are already used, the MIX board is refused. When the license is set to 0, only 0/4/4 MIX boards are accepted.

2.2.1.9 Number of SIP trunk channels license

The license gives the maximum number B-channels assigned for external communications on SIP trunks.

2.2.1.10 Number of Open SIP phones license

An Open SIP phone is a SIP phone with enhanced features capabilities compared to a basic SIP phone.

For a basic SIP phone to be operational with the Open SIP phone capabilities, 2 licenses are required:

- 1 UTL license
- 1 Open SIP phone license

OMC does not allow the creation of a new Open SIP phone subscriber if one of these two licenses is not, or is no more available.

2.2.1.11 Number of voice mail ports license

They are common to voice mail and automated attendant. In the default state, two ports are created. They are in the attendant default group and in the first hunting group.

For example: If by configuration, you remove the two ports from the default attendant group because you do not have automated attendant (it is not mandatory).

Then, if there is a SWL upgrade, which permits 4 ports and automated attendant, you will need to create two new ports, present in the attendant default group and in the first hunting group. But the two previous ports are not updated (not present in the attendant group).

If number of VMU ports is set to **0**, the system is forced to external VMU mode.

2.2.1.12 Voice Mail storage capability license

This licenses gives the maximum storage capacity for Voice Mail messages (steps of 10 minutes).

2.2.1.13 Automated Attendant license

This license is a global Voice Mail flag (opened/closed). If opened, it allows to configure the Information Messages for the Automated Attendant.

2.2.1.14 Enhanced Automated Attendant license

This license defines the number of different trees allowed for the Automated Attendant, up to a maximum of 5 trees. The Automated Attendant license above has to be opened to take into account the present license.

2.2.1.15 Audiotext license

This license is a global Voice Mail flag (opened/closed). It controls the use of the Audiotext service.

2.2.1.16 Distribution lists license

This license is a global Voice Mail flag (opened/closed). If opened, it allows to configure user mailboxes lists.

2.2.1.17 Record on line license

This license is a global Voice Mail flag (opened/closed). If opened, it allows the users to record conversations.

2.2.1.18 Number of greetings messages license

This license controls the number of greetings messages that can be played.

2.2.1.19 Length of customized MOH license

This license define the maximum length in minutes of the customized MOH.

2.2.1.20 Number of entities (for MOH) license

This license defines the number max of entities that can be differentiated with the MOH.

2.2.1.21 ACD licenses

The OXO Connect provides an embedded Linux based ACD (automatic call distribution) solution. The following capacities are defined through licenses: 1) 2) 3)

1. The Number of group: 8 groups
2. The number of active agents: 5, 10, 20 or 32
3. Statistic module: active or not
4. The number of PC agent (DAM): 0 -> 32
5. Supervisor: 0 -> 4
6. SCR (Smart Call Routing)

In the case of an upgrade, a reset is necessary.

2.2.2 Services controlled by the "CTI" software key

The following tables list the functions controlled by the "CTI" software key.

2.2.2.1 Non-CSTA application licenses

COUNTERn license	Application assigned	Relevant software version of OXO Connect	Default state	Granularity	Max
COUNTER1	PIMphony Pro/PIMphony Touch	From R2.0 (PowerCPU EE only)	0	+1	200
COUNTER2	PIMphony Team	From R2.0 (PowerCPU EE only)	0	+1	200
COUNTER3	Inactive deprecated **(*)** (previously used for Nomadic)				
COUNTER4	PIMphony release	From R2.0	0		
COUNTER5	PIMphony Attendant	From R2.0	0	+1	10

COUNTERn license	Application assigned	Relevant software version of OXO Connect	Default state	Granularity	Max
COUNTER6	Inactive deprecated **(*)** (previously used for PPU)				
COUNTER7	MyIC Social Networks	From R2.0	0	+1	25 (with TAPI desktop) 200 (with TAPI 2.1 server)
COUNTER8	MyIC Social Networks release	From R2.0	0		
COUNTER9	Inactive deprecated **(*)** (previously used for OBFM)				
COUNTER10	IP Desktop Softphone	From R2.0 (PowerCPU EE only)	0	+1	300
COUNTER[11 to 16]	Available for future use				

(*): Deprecated licenses means that they do not correspond to a commercial item in eLP. Inactive deprecated licenses do not contribute to the services level. They never appear in a first SWL edition.

They may appear in case of new SWL edition, generated in the scope of a migration from a release before the R2 to a R2 one, because these licenses were used in the previous release. In that case, for the R2, their value is set to 0. The system does not test these licenses anymore.

2.2.2.1.1 PIMphony Pro/PIMphony Touch license

This license is frozen, meaning that it is intended to give the number of such licenses bought by the customer before OXO Connect R2.0.

2.2.2.1.2 PIMphony Team license

The PIMphony Team license is incremented when new PIMphony Pro/PIMphony Team/PIMphony Touch applications are purchased.

When a PIMphony/PIMphony Touch application requests a connection to the system, the system considers that the maximum allowed connections is the result of the addition of the 2 licenses PIMphony Pro/PIMphony Touch and PIMphony Team.

2.2.2.1.3 PIMphony release

COUNTER4 is not counter: it contains the highest release value of PIMphony that can be run on the system.

Example:
If COUNTER4 = 50, all releases of PIMphony up to 5.0 can run on the system. 6.0 release cannot be used.

2.2.2.1.4 IP Desktop Softphone license

The IP Desktop Softphone is an application running on a user's PC desktop, tablet or smartphone, which emulates a 8058s Premium DeskPhone/8068 Premium DeskPhone/8068s Premium DeskPhone/8078s Premium DeskPhone.

For an IP Desktop Softphone application to be operational, 2 licenses are required:

- 1 UTL license
- 1 IP Desktop Softphone license

2.2.2.2 CSTA application licenses

Identifier	CSTA application	Controlled services	Relevant OXO Connect software version	Default state	Modularity	Max
1	**INTEGRATED TAPI 2.0 or TAPI desktop**	Number of sessions	From 2.0	0	+1	25
		Number of monitors	From 2.0	0	+1	50
		Features	From 2.0	None		All
2	Inactive deprecated **(*)** (previously used for Alcatel OmniTouch Call Center Office)					
3	**CSTA DESKTOP CLIENT**	Number of sessions	From 2.0	0	+1	25
		Number of monitors	From 2.0	0	+1	50
		Features	From 2.0	None		All
4	Inactive deprecated **(*)** (previously used for Central Services)					
5	**CSTA Server**	Number of sessions	From 2.0	0	+1	25
		Number of monitors	From 2.0	0	+1	300
		Features	From 2.0	None		All
6	**TAPI 2.1 SERVER**	Number of sessions	From 2.0	0	+1	25

Identifier	CSTA application	Controlled services	Relevant OXO Connect software version	Default state	Modularity	Max
		Number of monitors	From 2.0	0	+1	300
		Features	From 2.0	None		All
7	**Busy Lamp field**	Number of sessions	From 2.0	0	+1	200
		Number of monitors	From 2.0	0	+1	500
		Features	From 2.0	None		all
8	Inactive deprecated **(*)** (previously used for old OTS or XML server)					
9	**Extended Busy Lamp field**	Number of sessions	From 2.0	0	+1	200
		Number of monitors	From 2.0	0	+1	500
		Features	From 2.0	None		all
10	Inactive deprecated **(*)** (previously used for PIMphony Unified)					
11	Gateway SIP phone (not a license, internal use)					
12	Inactive deprecated **(*)** (previously used for ECS)					
[13-32]	Available for future use					
33	**OTS** (not a license, internal use)					

(*): Deprecated licenses means that they do not correspond to a commercial item in eLP. Inactive deprecated licenses do not contribute to the services level. They never appear in a first SWL edition.

They may appear in case of new SWL edition, generated in the scope of a migration from a release before the R2 to a R2 one, because these licenses were used in the previous release. In that case, for the R2, their value is set to 0. The system does not test these licenses anymore.

Chapter

3 *Network Time Protocol*

3.1 Overview

This section describes the timestamp exchange between the server and the client to calculate the time correction.

In the client/server standard mode, the client sends an NTP request to the server. On receiving a reply from the server, the client calculates the de-synchronization. It applies an adjustment to its own clock. NTP service uses 4 timestamps.

The following table summarizes the four timestamps:

Timestamp Name	ID	When Generated
Originate Timestamp	T1	Time request sent by client.
Receive Timestamp	T2	Time request received by server.
Transmit Timestamp	T3	Time reply sent by server.
Destination Timestamp	T4	Time reply received by client.

To calculate the round-trip delay **d** and local clock offset **t** relative to the server, the client sets the transmit timestamp in the request according to the client clock in NTP timestamp format.

The server copies the originate timestamp field in the reply and sets the receive timestamp and transmit timestamp according to the server clock in NTP timestamp format.

When the server reply is received, the client determines a Destination Timestamp variable as the time of arrival according to its clock in NTP timestamp format.

The round-trip delay d and local clock offset t are defined as:

- $d = (T4 - T1) - (T2 - T3)$
- $t = ((T2 - T1) + (T3 - T4)) / 2$

It is assumed that sending and receiving times are equal.

Several exchanges are required to refine synchronization.

3.1.1 Synchronization

NTP Protocol provides two synchronization techniques:

- Instant synchronization with a reference clock, in this case, the time is immediately synchronized on the client.
- Progressive synchronization is based on the NTPD service that manages the exchange of NTP requests on port UDP 123. It provides the algorithms for source selection and the correction calculations to ensure convergence with the time server.

    Note:
    This synchronization takes a longer time before being established, several hours to several days. It is possible to obtain a higher degree of accuracy by using several reference sources.

When possible, instant synchronization is used initially and progressive synchronization maintains accuracy within the network.

Chapter	**3**	*Network Time Protocol*

3.1.2 NTP Authentication

Authentication is used to guarantee the origin of the servers.

As time is a critical data for real time tools, a protection mechanism can be used to authenticate the NTP message exchanges. For this purpose, the NTP module of the Call server has the algorithm for encoding RSA Message Digest 5 (MD5) on private symmetrical keys.

A list of keys is defined and exported throughout the network where authentication is used. At each source level, a list of valid or trusted keys, selects the authorized keys which can be used by the client or the server for authentication. An authentication parameter validates the NTP messages for a machine.

3.1.3 Time diffusion architecture

NTP works on a hierarchical model in which a small number of servers give time to a larger number of clients. The clients on each stratum are in turn, potential servers to an larger number of clients of a higher numbered stratum.

Stratum numbers begin from the primary (stratum 1) servers to the low numbered strata by arborescence.

NTP Protocol distributes the reference time (UTC) through a hierarchical structure.

The atomic clocks (based on cesium 133) are regarded as stratum 0, the highest clock reference.

The servers which are connected are called primary servers and provide the national time standards (stratum 1).

Strata 0, 1 are reserved access strata.

Going down by successive layers through a pyramidal structure, Internet servers are situated at layer 3.

Each layer is client of the upper layer and server for the lower layer. Stratum 2 is used as reference to stratum 3. A client/server configuration uses this diffusion mode.

3.2 NTP and OXO Connect

This document describes the NTP client service provided by OXO Connect system.

The OXO Connect system server is the NTP server, and can operate as an NTP client.

The OXO Connect is the time server for all devices which are registered on it.

3.3 Architecture

The time server can be a local time server, an external time server or another OXO Connect.

In the figure below:

• The red arrows represent synchronization with the NTP process
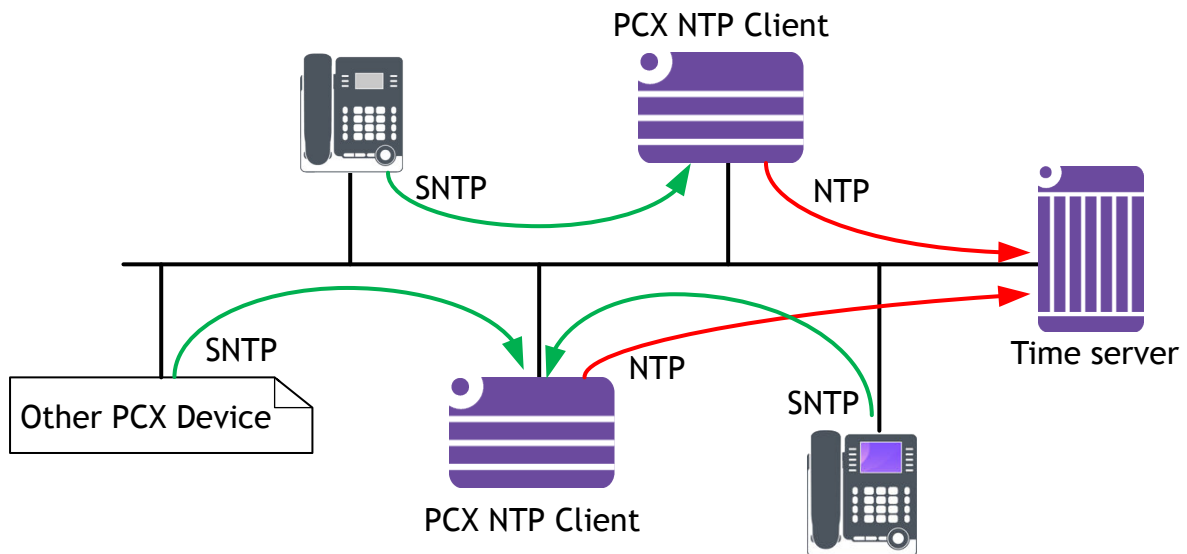• The green arrows represent synchronization with the SNTP

Figure 3.1: NTP architecture

Simple Network Time Protocol (SNTP) is a simplified version of the NTP protocol used for devices with small computing capabilities.

Example devices can be 8135s or 8088 Smart DeskPhone which use the SNTP service of OXO Connect.

SNTP is not used for the OXO Connect system because the clock accuracy decreases over time. It is not recommended by the RFC 5905.

3.4 Description

This feature allows the synchronization of the OXO Connect with a centralized time server to provide consistency and accuracy for all clocks on an OXO Connect network and in this way a reliable time is provided for each ticket.

The most probable use case is to synchronize the server with an internet public time server. This requires the exchange of NTP messages between the OXO Connect server and the designated reference time server.

Version 4 NTP protocol is used, which is backwards compatible with NTP version 3 (NTPv3). NTPv4 includes mitigation and discipline algorithms that increase the potential accuracy to the tens of microseconds with modern networks.

During the NTP process, there are two types of synchronization:

- Initial synchronization updates local time with the reference time server clock
- Corrective synchronization which modifies the clock frequency to correspond with the time server clock.

3.4.1 Security

All NTP messages are sent and received through the UDP port 123. This port is opened in the OXO Connect firewall for LAN and WAN. If an external time server is used, then the UDP port 123 must be opened between the client and the server.

3.4.2 Synchronization process

When the initial NTP synchronization is activated in the OMC, see Configuration on page 24, the system takes the date and time of the server and updates its own Linux clock to have exactly the same time.

When the NTP client is running, the NTP process sends an NTP request every minute to the designated time server. The response is used by the NTP process to adjust the local time to the server time.

The delay of convergence depends on the difference between the server time and the local time. The different cases are:

- If the server is unreachable (no replies to the NTP request), the client continues sending requests to its reference server every minute.
- If the clock shift is less than 1 second for NTP, the Linux clock frequency is modified.
- If the clock shift is greater than 1 second, the answer is measured and the Linux clock frequency modification is computed taking into consideration the previous response, With the data the process is able to compute a gradual Linux clock frequency modification.

If the clock shift is greater than 10 minutes, the NTP client forces an initial synchronization to update its server time. This synchronization is carried out instantly. After an initial synchronization, the NTP process for smooth synchronization is continued.
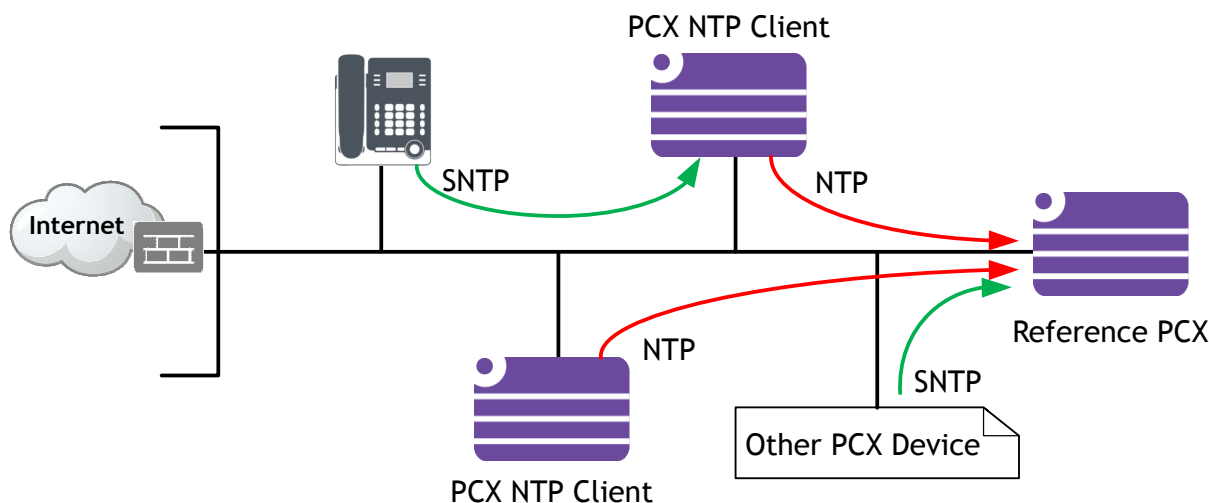
Any initial synchronization is logged.

3.5 Topologies and synchronization

The following sections provide diagrams to describe the three main topologies that can be used for a reference time server for a telephone network.
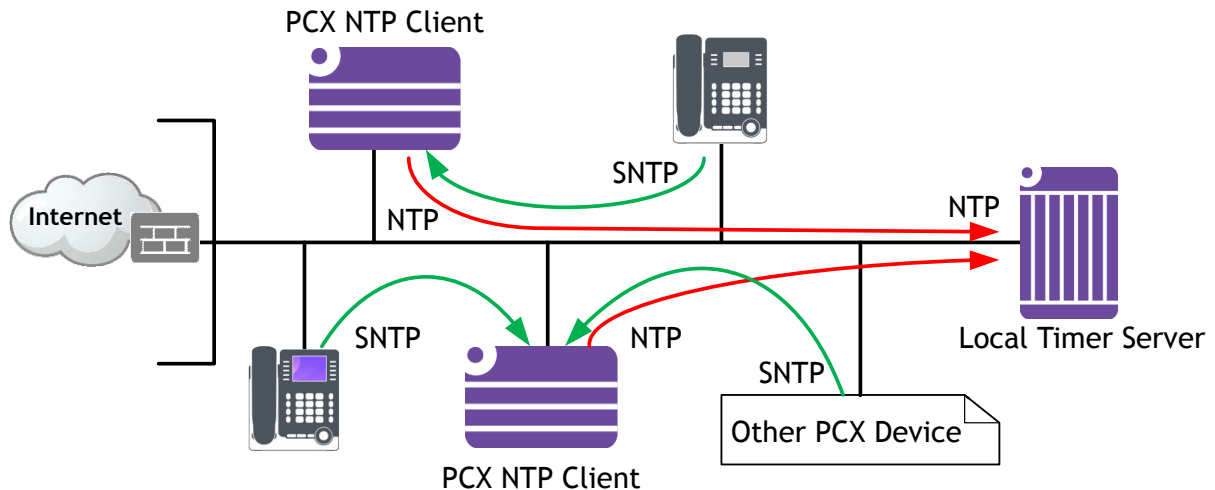
3.5.1 Synchronization with another OXO Connect

One OXO Connect is the time reference for each other OXO Connect in the system. Each device sends the SNTP request to the OXO Connect to which it is registered, **not** to the reference time server OXO Connect.
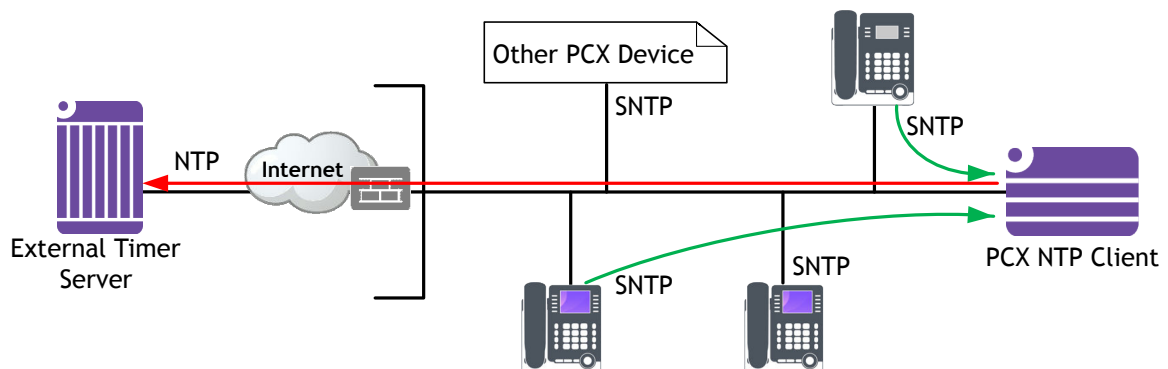
3.5.2 Synchronization with a local time server

A specific time server is used as the time reference for each OXO Connect. Each device sends an SNTP request to the OXO Connect to which it is registered, **not** to the time server.

3.5.3 Synchronization with an external time server

It is the most common topology. The external time server is the time reference for the OXO Connect. Each device sends the SNTP request to the OXO Connect to which it is registered, not to the reference time server.

3.6 Configuration

The NTP synchronization is configured in OMC.

To synchronize with an external time server:

1. In OMC, select **System Miscellaneous** > **Set PCX Date and Time**.
2. Check the **Auto** box to allow time synchronization with either an ISDN connection or an NTP server.
3. Select the **Enable NTP Client** radio button to select time synchronization with an NTP server.
4. In the **NTP Server name or IP** field, enter the NTP server name or IP address.
5. Click the **Apply** button to send the synchronization configuration to the OXO Connect, and activate the OXO Connect time synchronization.

1. In OMC, select **System Miscellaneous** > **Set PCX Date and Time**.
2. Check/uncheck the **Auto** box to enable/disable time synchronization with an NTP server.

3. Select the **Enable NTP Client** radio button to select time synchronization with an NTP server.
4. In the **NTP Server name or IP** field, enter the NTP server name or IP address.

   Default value: `pool.ntp.org`
5. Click the **Apply** button to send the synchronization configuration to the OXO Connect, and activate the OXO Connect time synchronization.

When the NTP synchronization is activated, the date and time can be modified manually in the OMC and in the operator session. See Operator session on page 25 for more details about the operator session.

When NTP synchronization is activated in the OMC, the first synchronization is forced to have exactly the same time between the local clock and the time server clock. A message is displayed to indicate if the synchronization is done or if the time server is unreachable.

When an ISDN connection is available, it can be used for synchronizing the time and date in the OXO Connect . To avoid conflict with this type of synchronization, the NTP configuration panel is grayed if the ISDN synchronization is activated.

For reliability it is recommended to use the ISDN synchronization.

To resume ISDN synchronization after using NTP, the administrator must disable NTP in the configuration panel and then activate the ISDN synchronization. It is not possible to activate the two types of synchronizations simultaneously.

To use the ISDN synchronization:

1. In OMC, select **System Miscellaneous** > **PCX Date and Time**.
2. Check the **Auto** box to allow time synchronization with either an ISDN connection or an NTP server.
3. Select the **Default synchronization (ISDN if present)** radio button.
4. Click the **Apply** button to send the synchronization configuration to the OXO Connect, and activate the OXO Connect time synchronization.

3.7 Operator session

The principal interactions are generated from the designated NTP server and the system as in Synchronization process on page 23. During operator sessions, the date and time parameters for the system are accessible and can be modified when:

• Configuring phones
• Configuring PIMphony

When the NTP server is configured, any modification to the date and time carried out by the operator will be overwritten:

• With an initialization if the time difference is greater than ten (10) minutes
• A gradual adjustment to the time if the time difference is less that ten (10) minutes

Chapter

4 *DHCP configuration*

4.1 Introduction

This chapter presents the configuration for the OXO Connect DHCP server.

The OXO Connect DHCP server can be used to simplify the deployment of Alcatel-Lucent IP sets, generic SIP phones, Alcatel-Lucent OmniSwitch 2220/6250/6350/6360/6450/6560/6860/6860E and STELLAR WLAN Access point.

The configuration of the OXO Connect DHCP server is detailed in the following sections:

The OXO Connect DHCP server's configuration file and the log file are available in **/current/debug** directory of OXO Connect. These files are downloaded via **Dump System** in the installer session of webdiag.

4.2 OXO Connect DHCP server configuration during startup wizard

The configuration of the OXO Connect DHCP server for Alcatel-Lucent IP sets and Alcatel-Lucent OmniSwitch is available in the OMC startup wizard and in the startup wizard for phones (Business and Hotel mode). For more details, refer to [Installation Manual 8AL91217USAH] Start-Up - System Startup from OMC - Services provided - Mode 2: Typical installation.

The following parameters can be configured:

*   Activation/deactivation of the OXO Connect DHCP server for Alcatel-Lucent IP sets and Alcatel-Lucent OmniSwitch

    Note:

    By default, the DHCP server is enabled for Alcatel-Lucent IP sets and Alcatel-Lucent OmniSwitch with default IP address ranges.

    The first default IP address range is forAlcatel-Lucent IP sets:

    *   *Start IP Address: 192.168.92.10*
    *   *End IP Address: 192.168.92.69*

    The default IP address range is for the switches:

    *   *Start IP Address: 192.168.92.5*
    *   *End IP Address: 192.168.92.9*

    The default IP address range is for STELLAR Access Point:

    *   Start IP: 192.168.92.70 (Default Value)
    *   End IP: 192.168.92.133 (Default Value)
*   Definition of multiple IP address ranges for Alcatel-Lucent IP sets

    Note:
    Multiple subnets in DHCP is not possible
*   Definition of IP address range for Alcatel-Lucent OmniSwitch

Note:
No coherency check is done on IP addresses.

Note:
If a separate VLAN is configured for voice, the DHCP range must be included in the voice VLAN range.

The DHCP configuration wizard is also available on ALE-300/400/500 Enterprise DeskPhone, ALE-20/20h/30h Essential DeskPhone, 8058s Premium DeskPhone, 8038 Premium DeskPhone, 8068 Premium DeskPhone, 8068s Premium DeskPhone, 8078s Premium DeskPhone and 8039 Premium DeskPhone sets. For more information refer to [Installation Manual 8AL91217USAH] Start-Up - System Startup from a Phone Set - Configuration procedure - IP configuration.

4.3 Automatic provisioning of Alcatel-Lucent OmniSwitch via DHCP

Alcatel-Lucent OmniSwitches are initialized with default IP address range. They receive, via DHCP and TFTP, the default configuration file available in the OXO Connect server.

Automatic provisioning is available only on Alcatel-Lucent OmniSwitches updated with the binary version 6.6.4, which supports the requirement to give preference to OXO Connect DHCP offer thanks to ALU Vendor Specific Information. See : OmniSwitch SW delivery notes.

Note:
Automatic provisioning of Alcatel-Lucent OmniSwitch is not supported if the OXO Connect is configured with separate VLAN for voice.

Note:

Alcatel-Lucent OmniSwitch 2220/6250/6350/6360/6450/6560/6860/6860E are the only switches supported by this feature.

Specifically supported switches are:

- *OS6450-P24*
- *OS6450-P24L*
- *OS6450-P10*
- *OS6450-P48*
- *OS6450-P48L*
- *OS6450-P10L*
- *OS-6350-P24*
- *OS-6350-P48*
- *OS6250-P24*
- *OS6860-P24*
- *OS6860-P48*
- *OS6860E-P24*
- *OS6860E-P48*
- *OS6350-P10*
- *OS6350-10*
- *OS2220*

As of R5.0, the following switches are supported

- *OS6360-10*
- *OS6360-P10*
- *OS6360-24*
- *OS6360-24X*
- *OS6360-P24*
- *OS6360-P24X*
- *OS6360-48*

- *OS6360-48X*
- *OS6360-P48*
- *OS6360-P48X*
- *OS6560-24Z8*
- *OS6560-P24Z8*
- *OS6560-24Z24*
- *OS6560-P24Z24*
- *OS6560-PXZ24*
- *OS6560-P48Z16*

Note:
Firmware upgrade is not in the scope of this feature.

Note:

The default IP address range is for the switches:

- *Start IP Address: 192.168.92.5*
- *End IP Address: 192.168.92.9*

Note:
OXO Connect VoIP package is mandatory for the automatic provisioning of Alcatel-Lucent OmniSwitch.

Default instruction/configuration files are included in the OXO Connect software package that can be adapted to customer network requirements.

They can be imported/exported using the OMC > **Import/Export** > **File Management for Third Party devices & omniswitch**.

Note:
Multiple subnets in OXO Connect DHCP server are not supported. Configuring DHCP range in multiple subnets, i.e. subnet other than OXO Connect subnet, stops the DHCP server. DHCP range has to be given in voice VLAN range if separate VLAN is configured for voice.

Note:
No coherency check is carried out for IP addresses.

The TFTP server address information is received from the OXO Connect DHCP server. The Alcatel-Lucent OmniSwitch downloads the instruction file from the TFTP server.

The name of the instruction file is fixed : `os_ins.alu`.

The name of the configuration file can be modified but must be identical to the file defined in the instruction file, by default : `os_conf` (no space, no special characters).

The name of the configuration file must be different from the name of the instruction file.

The instruction file provides the following information:

- Configuration file name and location
- Script file name and location
- TFTP server address.

Note:

- *As of R5.0, OS6360 and OS6560 switches with AOS version 8 are supported. These switches have separate instruction file (`os8_ins.alu`) and configuration file (`os8_conf`), both available on the TFTP server (OXO Connect). They are downloaded by the relevant switches on DHCP request. The script file (`os_script`) is identical to that of other switches.*
- *When the OXO Connect IP address is changed, the TFTP server address information in the instruction file is updated with the OXO Connect IP address.*
- *The TFTP server IP address in the Omniswitch instruction file is always the OXO Connect IP address until import of the custom file.*

The **ONLY** control/check done by OMC on the instruction/configuration files, is the file size which is limited to 0.5 Mb. Support only Daisy chained OmniSwitch topology.

Note:
Voice QoS is supported via the DSCP value configured in the OXO Connect and in the configuration file of ALU IP devices/third party SIP Phones. The DSCP values have to be same across all the devices connected to the Alcatel-Lucent OmniSwitch.

4.4 OXO Connect DHCP server configuration for generic SIP Phones

The possibility for generic SIP phones to use the OXO Connect as DHCP server is offered.

Provisioning generic SIP Phones consists in:

- Assigning an IP address to the phone through the DHCP server
- Transmitting provisioning server address, configuration file path and other DHCP options configured via OMC to the set
- Downloading the configuration file from the OXO Connect to the set

To configure the OXO Connect DHCP server, the following operations are required:

- Activate the DHCP server and define the DHCP IP address range, refer to Activate the DHCP server and define the DHCP IP address range on page 29.
- Configure the DHCP server, refer to Advanced DHCP server configuration on page 29.
- Configure the DHCP option profile, refer to DHCP profile option configuration on page 30.
- Import the configuration file, refer to Importing the configuration file on page 31.

4.4.1 Activate the DHCP server and define the DHCP IP address range

To activate DHCP OXO Connect server and define the IP address range:

1. In OMC, go to **Hardware and Limits** > **LAN/IP Configuration** > **DHCP**.
2. In the **Advanced DHCP IP range** area, check the **Enable** box.
3. Define the range of IP addresses (**Start IP address** and **End IP Address**).

   Note:
   The Start IP address and End IP address in the Advanced DHCP IP range should not contain any IP address that will be assigned as a static IP to a MAC Address in DHCP Parameters tab.
4. Click the **OK** button to confirm your entries.

Note:
If a separate VLAN is configured for voice, the DHCP range must be included in the voice VLAN range.

To view the list of associated IP Addresses to MAC address: in OMC:

1. In OMC, go to **Hardware and Limits** > **LAN/IP Configuration** > **DHCP**.
2. Click the **MAC/IP** button.

   This button displays the list of connected Third-Party SIP Phone associated with MAC and IP addresses.

   Note:
   *If the Generic SIP Phone is configured in static mode, the **MAC/IP** button does not display details about the MAC and IP.*

4.4.2 Advanced DHCP server configuration

Advanced DHCP server configuration in OMC provides the possibility to classify and group devices based on the following device IDs:

- Vendor Class Identifier (VCI)
- MAC Address
- MAC group
- Any Device

To configure the Advanced DHCP server:

1. In OMC, go to **Hardware and Limits** > **LAN/IP Configuration** > **DHCP**.

2. Click the **Advanced DHCP** button.

3. Select the **DHCP Parameters** tab.

    The **Advanced DHCP Configuration** window opens.

4. Select a **Device ID**:

- **Vendor Class Identifier** (VCI): for this Device ID, the type is either **string** or **data-string**

  Note:
  The IP address value is dynamic for VCI and non modifiable.

- **MAC group**: MAC address with wild card (eg: aa:bb:cc*) must be entered in the **VCI/MAC** column after selecting **Device ID** as **MAC group**.

  Note:
  The IP address field is dynamic and non modifiable.

- **MAC Address**: a complete valid MAC address must be entered in **VCI/MAC** column after selecting **Device ID** as **MAC address**.

  Note:
  *The IP address field can be modified to provide a static IP address. Dynamic IP allocation is not possible for **MAC address**.*

- **Any Device**: selecting this option deactivates all the fields except **profile index**

5. Select **Profile Index**.

    Note:
    *Profile indexes refers to one of the DHCP option profile index entries (configured in the **DHCP Option Profile configuration** window, see).*

6. Click **OK** to confirm your entries.

Note:

The prioritization of device id list must be done by the user explicitly as the DHCP server does not prioritize it automatically:

- *All MAC address entries (complete MAC address) must be placed before MAC Group or VCI entries.*
- *The **Any Device** option must be the last entry (if this option is configured). After **Any Device** is selected no other configuration is taken into account by the DHCP server.*

Note:
Up to 20 indexes can be configured.

4.4.3 DHCP profile option configuration

It is possible to associate multiple DHCP options to a specific profile (index).

To configure specific profiles:

1. In OMC, go to **Hardware and Limits** > **LAN/IP Configuration** > **DHCP**.

2. Click **Advanced DHCP**.

3. Select the **Options Profile** tab.

    The **DHCP Options Profile Configuration** window opens.

4. Right-click, to display the contextual menu.

5. Select **Add** to add an index.

6. For each index, in the **Code** column, select a code (according to DHCP RFC 2132)

A value between 1 to 255 can be entered. The following option codes are displayed by default in the drop-down list:

- Next server option
- Option 43 – Vendor specific information
- Option 66 – TFTP server name
- Option 67 – Bootfile name
- Option 150 – Configuration Path name

Note:
To declare DNS server in DHCP offer, the option code 6 (which stands for `domain-name-servers`) must be added to the option profile. If this not the case, the OXO Connect is used as default DNS server.

Note:
*When the user enters the code number, the code name is displayed in the **Name** column (for example, Option code 67 stands for "bootfile name"). This name is non editable. For the option codes without any names, static name (**user defined 1**, **user defined 2**...) defined in OMC is displayed.*

Note:
*For each index, to add multiple options, select **Subline Add** in the contextual menu.*

7. In the **Type** column, select the supported data types.

8. In the **Value** column, enter the value corresponding to the code value of the **Code** column.

9. Click the **OK** button to confirm your entries.

Note:
Carefully verify your entries before validating your modifications. No system verification is performed by the OMC or the system DHCP server.

Note:
*For configuring OXO Connect IP address in any of the value fields (e.g. TFTP server address, NTP), the **OXO_IP** macro can be used.*

Note:
*Using the **OXO_IP** macro in data string is not supported.*

Note:
*When an external DHCP server is used, the parameter **Next server** IP must be defined. If OXO Connect is used as next server, then either the **OXO_IP** macro or OXO Connect address must be used*

Note:
To send DNS details in the DHCP offer, option 6 (domain-name-servers) must be configured in the Options Profile tab of the OMC. OXO Connect is the default DNS server when this option has not been configured.

4.4.4 Importing the configuration file

After IP address assigning, third-party SIP phones contacts provisioning server download the boot/ configuration file from the DHCP server (external server or OXO Connect as the DHCP server).

The provisioning server address and the configuration file path configured in OMC are provided to terminals as part of the DHCP offer message. Either the OXO Connect or some external server can be used as a provisioning server. If the OXO Connect is used as the provisioning server, the configuration files of the third-party SIP phones must be imported into the OXO Connect via OMC.

Multiple configuration files can be imported, exported or deleted into/from OXO Connect via OMC, the size of the repository containing all the configuration files is limited to 20 MB.

Note:
Third-party SIP phone configuration and binary files imported into the OXO Connect are not validated or verified by OXO Connect or OMC. It is the responsibility of the user to import the valid configuration file(s) for the devices.

Note:

If the external server is used as the provisioning server, it must be configured in line with the terminal's requirement and the OXO Connect doesn't have control over the external server.

To import each configuration file:

1. In OMC, go to **System** > **Import/Export** > **File Management for Third Party Devices**
2. Select a directory as follows:

   - For an existing directory, choose: **Omniswitch** or **ThirdParty_Devices** and click the **Import** button
   - For a new directory, click the **Create Dir** button and enter the directory name in the displayed window
3. In the browse window, select the file to import
4. Click the **OK** button to confirm your entries
5. If required, repeat steps 2 to 5 for each configuration file

File management for third-party devices:

It is possible to select and import multiple (configuration and binary) files for third-party SIP phones and omniswitch files to the OXO Connect. The OXO Connect acts as the provisioning server for third-party SIP phones.

The following information to import the multiple third-party SIP phone files are needed:

- Multiple files can be selected and imported to the OXO Connect through OMC for third-party SIP phones
- The third-party SIP phones configuration files can be managed (import/export/delete) through OMC into the OXO Connect, whereas the binary files can be imported/deleted, but cannot be exported
- The user can create or maintain one directory level to each device type to maintain the respective device configuration files
- **Omniswitch**, **Secured_Config**, **ThirdParty_Devices** and **Binary** directories are available by default in the OXO Connect
- The user must take care of the importing appropriate files to proper repository based on the devices

Prerequisites for auto-provisioning of third-party SIP phones by OXO Connect:

- The following information [url/path] must be used:

  - Via HTTPS, the URL: `https://<OXO_IP>/securcfg/<config_filename>`
  - Via HTTP, the URL: `http://OXO_IP/tpcfg/<config_filename>`
  - Via TFTP, the path: `/tftpboot/<config_filename>`
- Auto / remote provisioning through DHCP must be supported by the terminal.
- The terminal must be able to receive the provisioning server address; configuration file path and all the configured options.
- The terminal must be able to download its configuration file through tftp / http protocol.
- The terminal must be able get all the initial / default configuration required for basic operations through the configuration file from the provisioning server without requiring manual configuration either on terminal or through web interface.
- The terminal must send its vendor class identifier (option 60) in DHCP discover message in ASCII format which can be configured by user in OXO Connect DHCP server through OMC, see Advanced DHCP server configuration on page 29.

4.5 STELLAR WLAN Access point DHCP server configuration

From OXO Connect R2.1, STELLAR access point (with ZTP supported image) can be deployed with zero touch configuration and also supports secure HTTPS communication with OXO Connect.

Chapter	**4**	*DHCP configuration*

Automatic provisioning of Wifi-6 Stellar APs is supported from OXO Connect R5.0.

By default, STELLAR Access Point instruction and configuration files are integrated into the OXO Connect binary but no STELLAR Access Point image file is provided in OXO Connect.

Note:
Advanced WLAN (VoWLAN) settings are not available with STELLAR Access Point ZTP for OXO Connect R2.1.

Note:
Automatic provisioning of HAP (Stellar AP) is not supported if the OXO Connect is configured with separate VLAN for voice.

When the network interface on STELLAR Access Point is ready, a DHCP client is automatically started.

In addition to the network configuration, the following information is acquired from the OXO Connect DHCP server, after a connection is established:

- HTTP & HTTPS server IP address (OXO Connect IP address is used for both)
- Instruction file name and location

To configure the OXO Connect STELLAR Access Point DHCP server, the following operations are required:

- Activating the DHCP server for STELLAR Access Point and defining the IP address range on page 33
- To get the default configuration settings, Exporting the configuration file on page 34
- Optionally, to customize the configuration, Importing the configuration file on page 34

4.5.1 Activating the DHCP server for STELLAR Access Point and defining the IP address range

From R2.1, import is not mandatory anymore since the instruction and configuration files are generated automatically by the OXO Connect.

The configuration is specific to each OXO Connect.

It is possible to import STELLAR instruction and configuration files to customize the default configuration. If the imported files are deleted, the default files are restored.

To activate STELLAR Access Point DHCP OXO Connect server and define the IP address range:

1. In OMC, go to **Hardware and Limits** > **LAN/IP Configuration** > **DHCP**
2. In the Advanced **Stellar AP: DHCP IP Range** area, check the **Enable box**
3. Define the range of IP addresses (**Start IP address** and **End IP Address**)
   Note:
   Default IP range is:

   - **Start IP address**: 192.168.92.70
   - **End IP Address**: 192.168.92.133

   Note:
   Default value of virtual IP address is:

   - *192.168.92.134*
4. If needed, define the **Subnet Mask** (default value: 255.255.255.0)
5. Click the **OK** button to confirm your entries.

Note:
If the DHCP IP range configured for STELLAR access point overlaps the existing IP addresses, a popup is displayed.

To view the list of associated IP Addresses to MAC address in OMC:

1. In OMC, go to **Hardware and Limits** > **LAN/IP Configuration** > **DHCP**

2. Click the **MAC/IP** button

This button displays the list of connected Third-Party SIP Phone associated with MAC and IP addresses

4.5.2 Exporting the configuration file

The installer must export the STELLAR configuration file in order to display the default configuration generated by OXO Connect and get the default settings for STELLAR APs.

STELLAR AP default administrator passwords and SSID passwords are specified in the configuration file. STELLAR APs cannot be used without these passwords.

To export the configuration file:

1. In OMC, go to **System** > **Import/Export** > **File Management for Third Party Devices**
2. Select the **Secured_Config** directory and click the **Export** button
3. In the browse window, select the file to export
4. Click the **Export** button

4.5.3 Importing the configuration file

In OMC, provision is given to import the file from PC to OXO Connect, in order to customize default settings, when needed.

The instruction and configuration files are embedded by default in OXO Connect:

The configuration file name (hap_conf.ini) and path information are available in the instruction file.

The instruction file name (hap_instruction.ini) is transmitted in the OXO Connect DHCP Offer (DHCP option 67).

By default, the STELLAR access point instruction file (hap_instruction.ini) is available under **ThirdParty_Devices** directory.

Note:
The content of the instruction and configuration files can be modified, but the name of these files cannot be modified.

The configuration file provides the following information:

• Employee/Guest/Voice SSIDs (WLAN SSIDs)
• Passphrases
• Country code
• Virtual IP of cluster
• Admin password

Note:
VLAN ID is not provided in the default configuration file, but must be specified manually if necessary.

To import the configuration file:

1. In OMC, go to **System** > **Import/Export** > **File Management for Third Party Devices**
2. Select a directory as follows:

• For an existing directory, choose the **Secured_Config** directory and click the **Import** button
• For a new directory, click the **Create Dir** button, enter the directory name in the displayed window and click the **OK** button to confirm your entry
3. In the browse window, select the file to import
4. Click the **Import** button

The STELLAR access point image description file is not embedded in OXO Connect by default.

To upgrade the STELLAR access point firmware:

1. Load the STELLAR access point image description file into any directory other than **Secured_Config** to transfer it over HTTP protocol
2. Load the STELLAR access point image into the **Binary** directory

Note:

- *When STELLAR access point instruction and/or configuration files are deleted via OMC **Import/export**, the corresponding default files are regenerated.*
- *When one or all of the STELLAR access point files (instruction/configuration file) are imported, the parameters are not updated by the OXO Connect anymore in the corresponding files modified through OMC/MMC.*

  The imported files take precedence over OMC configuration and files generated by OXO Connect (including passphrases).
- *To update the parameters using OMC, the corresponding files must be deleted to generate new files.*

4.6 Easy deployment with VLANs restrictions

Alcatel-Lucent OmniSwitch and HAP (Stellar AP) deployment with OXO Connect in easy deployment mode is possible only for basic network topologies without usage of VLANs.

As a result, manual configuration is required for advanced settings on Alcatel-Lucent OmniSwitch and HAP (Stellar AP) network equipment to implement VLAN. Correct VLANs must be specified for each Alcatel-Lucent OmniSwitch port.

There are several ways to proceed:

- Use standard easy installation without any VLAN then configure VLANs manually on OXO Connect, Alcatel-Lucent OmniSwitch and HAP (Stellar AP) (advanced settings via web administration)
- Replace default settings for Alcatel-Lucent OmniSwitch and HAP (Stellar AP) with specific configuration files, or import them into OXO Connect using OMC, then launch easy provisioning of Alcatel-Lucent OmniSwitch and HAPs (Stellar APs).
- Without using easy installation procedure, configure VLANs in Alcatel-Lucent OmniSwitch and HAPs (Stellar APs) manually through the web administration.