ABLOY®

CLIQ™

ABLOY® PROTEC^2

Technical brochure

Overview

PROTEC^2 CLIQ™ SYSTEM

PROTEC^2 CLIQ™ is an easy to use access control system based on detainer disc cylinders and electronic identification. Thanks to our double technology, the access is double secured. ABLOY PROTEC^2 which is based on the patented rotating disc cylinder mechanism, takes care of the mechanical security at your site, while electronic CLIQ™ technology allows flexible control of keys, access rights and audit trails. PROTEC^2 CLIQ™ combines both technologies into one effective solution.

PROTEC^2 CLIQ™ keys are also available as Connect keys that can be wirelessly programmed using CLIQ™ Connect smartphone application in addition to RemotePDs and localPD. This enables the users to update their keys while in the field.

AN INTELLIGENT COMBINATION OF ELECTRONICS AND MECHANICS AND ONLINE OPENING WITH SMARTPHONE APPLICATION

Mechanical ABLOY PROTEC^2

- Durable design without springs and pins
- Disc Blocking System – patented feature that stops attempts to manipulate the discs
- Bump proof and virtually pick proof
- The key and cylinder features are patented until 2031
- 1,97 billion different key combinations
- The symmetrical key can be inserted both ways
- Only one key needed for each user
- Reliable function in severe environments

Electronic CLIQ™ technology

- CLIQ™ technology which is especially designed for locking industry provides unique identification for every opening through encrypted communication
- Battery inside the key provides wireless function of time and calendar with complete audit trail
- Calendar and time-based access rights are easy to change remotely
- Mechanical system is easily and cost-efficiently expandable with CLIQ™ properties

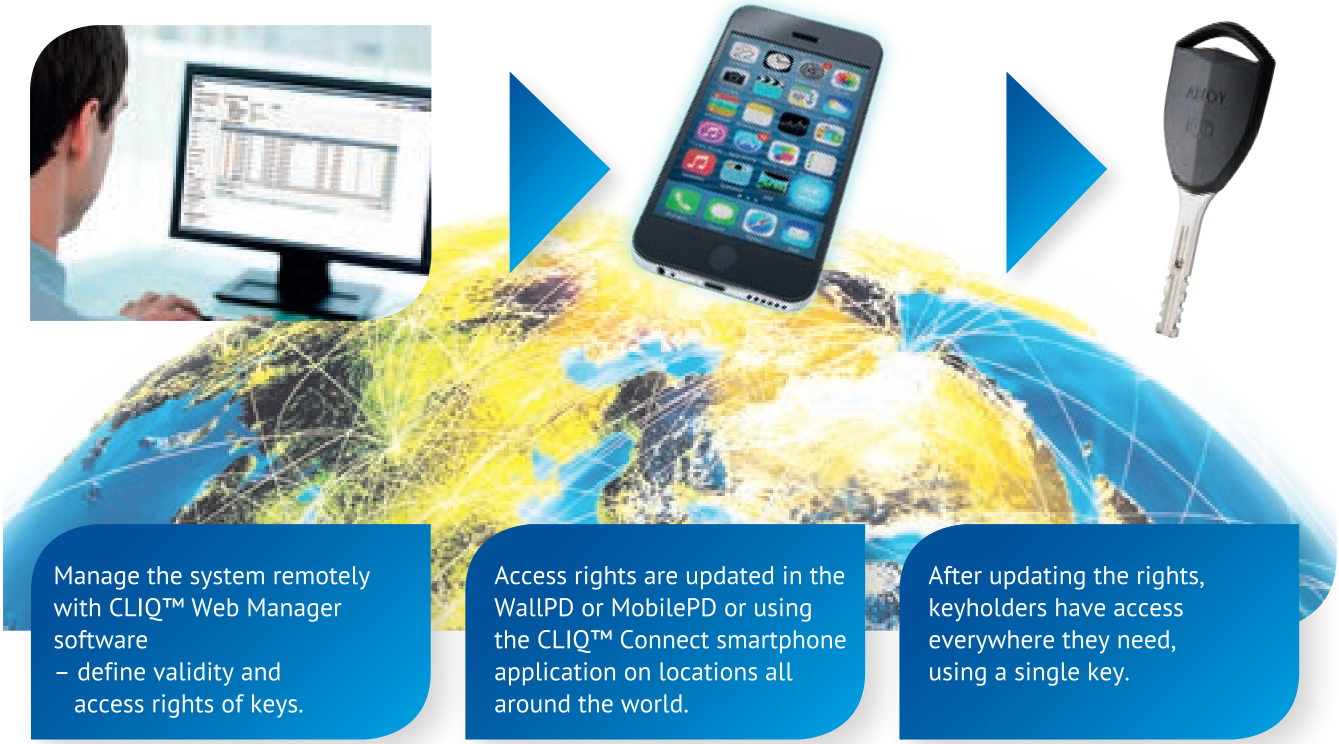
CLIQ™ Connect technology

- CLIQ™ Connect keys can be updated with a smartphone application
- Enables keys to be updated by the keyholders while working in the field
- For keys with the Online opening feature the key's access rights are checked in real time when the key is entered to a cylinder
- Key audit trail is transferred to CLIQ™ Web Manager when the key is updated in the smartphone application

Overview

CLIQ™ Web Manager for easy management

Browser-based CLIQ™ Web Manager allows to change access rights whenever and wherever required.



Manage the system remotely with CLIQ™ Web Manager software
– define validity and access rights of keys.

Access rights are updated in the WallPD or MobilePD or using the CLIQ™ Connect smartphone application on locations all around the world.

After updating the rights, keyholders have access everywhere they need, using a single key.

Applications

PROTEC² CLIQ™ is used among Professional End Users such as utilities, telecom, petroleum, transportation, hospitals, governmental institutions, banks and museums and railways.

PROTEC² CLIQ™ products

KEYS

The PROTEC² CLIQ™ key has a metal shaft and a watertight plastic bow which holds the electronics and battery. All PROTEC² CLIQ™ keys are equipped with a realtime clock and a memory to allow time-based functions and collection of audit trails.

The PROTEC² CLIQ™ keys are also available as CLIQ™ Connect keys. CLIQ™ Connect keys can be updated via bluetooth using CLIQ™ Connect smartphone application.

PROTEC² CLIQ™ user key specifications:

- Battery lifetime up to 10 years of operation and battery easy to change by opening a plastic cover.
- For bluetooth operated CLIQ™ Connect keys, battery lifetime is 1 year.
- Battery type is CR2450
- Buzzer indication and bicolor LED on both sides of the key
- Additional RFID cover available for use with transponders for access control readers
- Additional color covers available
- IP57 certified
- Operating temperature is -20 -+50
- Time functionalities available in all user keys (Validity settings, schedules, time stamps in audit trails)

PROTEC² CLIQ™ products

Normal user key

Normal user key is intended for cases where access rights are stable (e.g. grand master key) or changes are very rare. Changing the access rights for normal user key is done by changing electronical openings inside CLIQ™ locks via programming key, since there is no list of authorised locks on the key. Electrical openings in locks are defined in the locking planning software when the system is ordered and preprogrammed to the locks at the factory.

Dynamic key

Dynamic key is intended for cases when access rights often change as it is easy to program changed access rights directly to user keys. Authorised cylinder and/or cylinder groups needs to be programmed to dynamic keys via customer software (locally or remotely).

Programming key

Programming key is used as a credential to access the CLIQ™ Web Manager software. Administrator can create programming tasks in CLIQ™ Web Manager and the tasks are distributed to programming keys with localPD or Remote programming devices (eg. WallPD or CLIQ™ Connect app) in the field. Also cylinders´ audit trails can be retrieved with a programming key.

CLIQ™ Connect key

All keys are also available as bluetooth versions which enables them to be updated wirelessly.

PROTEC^2 CLIQ™ products

CLIQ™ keys

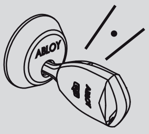
		BATTERY LIFE	CUSTOMER DEFINED VALIDITY	AUDIT TRAIL	FOREIGN AUDIT TRAIL	LIST OF LOCKS OR LOCK GROUPS	WEEKLY SCHEDULES	COMPATIBLE WITH CONNECT APP	ONLINE OPENING	REALTIME AUDIT TRAIL	LIST OF TASKS
PROTEC^2 CLIQ™											
Normal user key	TQ406/TQG406	Up to 10y	x	2000	20		50				
Dynamic key	TQ407/TQG407	Up to 10y	x	2000	20	3500	50				
Programming key	TQ403/TQG403	Up to 10y	x	8000	80						1250
CLIQ™ Connect keys											
Normal user key	TQB406/ TQGB406	1 y	x	2000	20		50	x			
Dynamic key	TQB407/ TQGB407	1 y	x	2000	20	800	50	x			
Programming key	TQB403/ TQGB403	1 y	x	2000	20			x			230
Online opening key	TQC407/ TQGC407	1 y	x	2000	20	800	50	x	x	x	
All new PROTEC^2 CLIQ™ Remote and CLIQ™ Connect keys are compatible with Remote programming devices.											

OPERATION INSTRUCTIONS

Use the cylinders with the key in a normal way, like using mechanical cylinders.

After inserting the key into the cylinder´s keyway wait for the sound signal before starting to turn the key. Signals are:

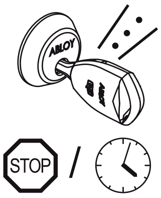
1 beep and green LED



OK

Key accepted, the lock can be opened after the beep

3 beeps and red LED

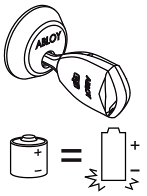


The key is denied, it is unauthorized by either code or time

3 long beep and green LED

The battery maybe weak or cold (try warming the key in your hand).

No beep



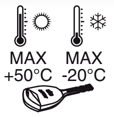
If there is no beep, try again. The battery can also be dead and needs replacing. In that case the lock can not be opened. Please contact the system administrator.

To ensure proper function of your PROTEC^2 CLIQ™ key, please note following precautions:

Avoid dropping the key.

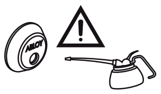
Keep the key away from dirt and moisture.

Do not use excess force on the key to pull doors open with it.



Avoid exposing the key to excessive heat or coldness.

Remove the battery cover and then insert a new battery to the key.



Incorrect lubrication is harmful for cylinder electronics. Use only ABLOY oil.

PROGRAMMING DEVICES

PROTEC² CLIQ™ keys can be updated locally via the local programming device also remotely with the remote programming devices. Remote features allow collection of audit trails, updating key's access rights, schedules and enables the use of key revalidation.

WallPD PDA100

WallPD is an indoor remote programming device which is used for updating keys. The communication between CLIQ™ Remote server, WallPD and the PROTEC² CLIQ™ key is encrypted for maximum security.

- Wall mounted remote programming unit
- Locking system specific
- No data storage
- IP42 rated
- LAN connection
- Power through 12-24 voltage adapter or PoE (Power over Ethernet)
- Support for proxy server
- Plug&play capability*

MobilePD PDA200

MobilePD is a portable and personal programming device which is an optimal choice for a keyholder when PROTEC² CLIQ™ key needs to be updated in various locations. MobilePD acts the same way as the WallPD regarding key update, but gets power from AAA-batteries and connection to Internet via a mobile phone (Bluetooth) or laptop (USB).

- Powered by standard 4x AAA batteries
- PDA200 Bluetooth & USB (for mobile phone and PC)
- Support for proxy server
- Plug&play capability*

*Plug&play installation for RemotePDs is available in CWM version 6.x and later

Other requirements:
-CLIQ™ Web Manager with DCS integration
-Firmware 6.0 or higher
-DHCP in use
-No proxies set up for RemotePD

PROTEC² CLIQ™ products

Outdoor WallPD PDA120

Outdoor WallPD is a remote programming device which can be installed outdoors and in hostile locations. Like the WallPD, outdoor WallPD connects to remote server via Ethernet and supports PoE.

- IP57 Water & dust protection
- IK9 Attack resistance

CLIQ™ reader TQ124

The CLIQ™ reader is a relay-controlled device which sends a signal to other devices or systems such as electric locks or alarm systems. CLIQ™ reader can be installed outdoors as it fulfills IP53 rating. It has an PROTEC² CLIQ™ cylinder inside thus it accepts only a key with correct access rights.

The housing of the CLIQ™ reader is installed outdoors next to the entrance. It is wired with the relay box which can be installed indoors. Relay operation is performed only when a key has correct access. Also the reader can be programmed with a programming key as any other CLIQ™ lock.

- Power input 12-24 VDC -10 / +15%
- Power consumption 60mA
- Relay load max. 0,8A 30V AC/DC resist 20W
- Max. 1 meter length of the wire between escutcheon and electronics.
- Note to cut the cable to proper length, do not extend the cable.

WallPD with reader PDA110

The WallPD with reader consists of 2 parts. It is a WallPD with a reader attached. The WallPD is installed indoors while the reader, which has IP53 rating, is installed outdoors next to the entrance door. The reader is attached to the Wall PD with a 2 meter cable.

- Maximum wire length 2 meters
- Inside unit specs same as PDA100
- Keys can be updated in both devices
- Does not contain a relay box

Local programming device PDA500

LocalPD is a PROTEC² CLIQ™ key programming device which is connected to a PC. LocalPD is used to authenticate administrators to CLIQ™ Web Manager system with the programming key and to program PROTEC² CLIQ™ keys locally.

- USB connection to PC
- Requires drivers (plug-and-play installation)
- USB powered

CLIQ™ Connect

PROTEC² CLIQ™ user keys and programming keys are also available as CLIQ™ Connect keys that can be programmed using the CLIQ™ Connect smartphone application in addition to the RemotePDs and the localPD. This enables the keyholders and administrators to update their keys while in the field. Also the audit trail is transferred to CLIQ™ Web Manager when the key is updated.

Keys with Online opening feature use the CLIQ™ Connect application to check access rights in real time when the key is entered to a cylinder. This enables real time access control for locations without landline internet connection.

CLIQ™ Connect keys use Bluetooth Low Energy technology to communicate with the application. The CLIQ™ Connect application then uses the smartphone's internet connection to connect to the CLIQ™ Remote application server in order to update the key's access rights and validity.

CLIQ™ Connect smartphone application is compatible with iOS version 8.0 or later and Android version 4.4 or later. For faster communication on Android platform version 5.0 is recommended. The list of tested Android devices Android devices list available from your regional sales. The application is available at Apple App Store and Google Play.

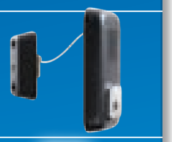
On iOS devices it is possible to keep three CLIQ Connect keys paired in the application at a time. On Android devices the limit is one CLIQ Connect key at a time

To use the CLIQ™ Connect smartphone application CLIQ™ Web Manager version 5.2.1 or later is required. For the Online opening keys CLIQ™ Web Manager version 6.0 or later is required.

End-to-end HTTPS connections (TCP port 443) must to be allowed to CLIQ™ Remote server and directory services.

PROTEC^2 CLIQ™ products

CLIQ™ Devices

	REMOTE UPDATE OF CLIQ KEYS	OFFLINE UPDATE	OPERATES RELAY	CONNECTION TYPE	POWER	
WallPD	✓	✓		LAN	12/24VDC or POE 3W	
MobilePD USB/ Bluetooth	✓	✓		Bluetooth to smartphone, USB to PC	4 x AAA battery / USB	
LocalPD	(✓)[1]			USB to PC	USB	
WallPD with reader	✓	✓		LAN	12/24VDC or POE 3W	
Outdoor WallPD	✓	✓		LAN	12/24VDC or POE 3W	
Connect APP	✓			Bluetooth to CLIQ™ Connect Key	Smartphone, IOS/Android	
CLIQ™ reader TQ124			✓		12/24VDC 1,5W	

[1] requires CWM ver. 6 and CLIQ™ Connect PC APP

CYLINDER FUNCTION

PROTEC^2 CLIQ™ cylinder contains mechanical cylinder structure of unique PROTEC^2 structure with nine discs. In addition the cylinder contains PROTEC^2 CLIQ™ cylinder electronics which controls the electronic blocking system. This electronically controlled cylinder blocking is realized by using a small electric motor to guide the turning of one detainer disc. The cylinder itself has no electric power source. This means no need of wires or battery change to the cylinders.

PROTEC^2 CLIQ™ key structure allows it to operate not only the PROTEC^2 CLIQ™ electronic cylinders but also mechanical PROTEC^2 cylinders with eleven discs. PROTEC^2 CLIQ™ key bow contains key electronics and battery to power the functions of the cylinder and the key itself in a watertight package. Electronic communication between the key and the cylinder happens via bipolar galvinc contacts. The key shaft itself functions as one pole the other one being an insulated metal strip on the side of the key shaft. Also the power to carry out the cylinder´s functions, is supplied via these contacts.

PROTEC^2 CLIQ™ products

When a key is inserted into a cylinder, the electronic communication is activated between the key and the cylinder. If the key is authorised to open the cylinder, the battery in the key powers the opening and closing function of the electronic blocking of the cylinder. Both cylinder audit trail and key audit trail are stored simultaneously.

CYLINDER MEMORY

- 1800 authorized key groups and programming keys together, theoretical maximum 65535 keys in each group
- A list of 3000 denied keys
- Audit trail of last 2000 events
- Audit trail of last 20 events from keys in other systems

ADVANCED CYLINDER FEATURES

Sequence lock

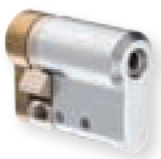
CLIQ™ cylinders are also available with the Sequence lock feature that can be programmed to the cylinder memory in the factory.

This lock type will require two valid keys to be entered to the cylinder before the lock can be opened. When the first valid key is inserted, the lock does not indicate or open. If a second valid key is entered within 1 minute, the lock will open. The sequence starts from the beginning after one minute has passed.

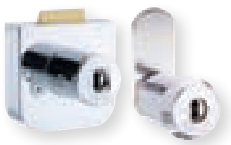
PRODUCT RANGE

Wide product range - one key fits all

Robust and IP68 classified padlocks with CLIQ™ functionality for the harshest conditions.



Suitable lock cylinders for every door. Available also inbuilt with dust protection.



Cabinet locks and cam locks with or without CLIQ™.

Key deposits for storing route keys securely.

CLIQ™ Web Manager

CLIQ™ Web Manager (CWM) is a Web-based software that enables the management and control of PROTEC^2 CLIQ™, an electromechanical locking system enabling full control over access authorizations and key holder activities. The CLIQ™ system presents a solution that ensures the reliability of mechanical keys and cylinders as well as the security and flexibility inherent in electronic locks. The CLIQ™ Web Manager user interface is currently available in 22 different languages. The information on this brichure correspondes with CLIQ™ Web Manager version 6 and later.

BASIC FEATURES

1. Secure login to management software

a. Triple authentication login requires local programming device, programming key with PIN code and a valid programming key certificate for the web browser.

2. Users and products

a. Creating, importing and editing user information
b. Handing out and handing in keys to users
c. Managing lost keys
d. Managing broken keys and cylinders and also product replacements
e. Changing cylinder status and location information
f. Handling cylinders in different time zones
g. Managing remote programming devices
h. Searching, viewing and exporting information on users and products

3. Access rights

a. Defining, restricting and changing access rights
b. Time based access rights are available for all user keys. It is possible to set validity settings (inactive, active between a time period or always active), weekly schedules and an additional revalidation for all user keys.

4. Audit trails

a. Collecting, viewing and exporting key and cylinder audit trails. Audit trail events can be automatically collected from user keys during remote programming.

5. Receipts and reports

a. Printing key hand out and hand in receipts
b. Viewing, exporting and printing reports of system like keys, cylinders, persons and audit trails.

ADVANCED FEATURES

1. Administration roles

a. are used for defining the functions a locking system administrator is allowed to perform. The functions visible in software depend on the role assigned to the programming key used by the administrator who is logged in. Administrators only have access to functions they need in their work. For example, an administrator responsible for key management may only have access to the hand out/hand in and the key lost/broken procedures.

2. Domains

a. are an administrative grouping feature which allows control over the specific parts of a locking system where administrators have access to. A domain consists of a set of cylinders/ cylinder groups, user keys and persons typically associated with a geographic or administrative region. Programming keys associated with a domain are only given administration rights for the included cylinders.

3. Remote programming

a. is a feature for writing information to user keys and programming keys via remote programming devices. For user keys it is possible to change cylinder authorizations (only for dynamic keys), validity settings and weekly schedules via remote updates. The latest audit trails can be also automatically downloaded from the key to the software during remote update. For programming keys it is possible to assign cylinder programming tasks via remote updates.

b. CLIQ™ system can also include CLIQ™ Connect keys which support remote programming via CLIQ™ Connect smartphone application.

4. Online opening

a. is a feature that can be set on CLIQ™ Connect keys. Once a key is entered to a cylinder, it will request access rights from the CLIQ™ Web Manager software via smartphone app. If access rights are approved in the software the key can open the lock. Key will always request online opening for every cylinder it can access.

5. Key revalidation

a. is a feature ensuring that keys are updated at certain time intervals. With key revalidation, keys must be inserted in a RemotePD ("revalidated") at specified time intervals to stay active. Once revalidated, the key stays active for the number of days, hours, and minutes specified as the revalidation interval, counting from the time it was revalidated. If a key is not revalidated within the specified interval, it becomes inactive until it is revalidated again.

6. Cylinder groups

a. is a set of cylinders which is used to simplify the administration in locking systems with many cylinders. Access can be given to a cylinder group in the same way as to a single cylinder. Combinations of cylinder groups and single cylinders can be used to create higher flexibility. Cylinder groups are optional feature and can be defined during planning of the system.

b. Note! All CLIQ™ locks needs to be mechanically keyed alike in cylinder group systems.

7. Access profiles

a. are used to give people who have specific roles the required accesses without having to configure each key individually. Keys and users can be associated to access profiles. The access profile then determines where the associated users and keys have access to. Access profiles can be freely defined in the software for example per user group office workers, cleaners, maintenance, etc. Access profiles work dynamically. If changes are made on access profile, system will generate remote programming tasks for each associated key automatically.

8. Flexible revalidation

a. is a feature that makes it possible to set the key revalidation interval per access profile and per cylinder group. This features is useful when the security level of cylinders or access profiles in the system varies. For example access to server room is considered to be more sensitive than access to a meeting room or more frequent revalidation might be required for subcontractors as compared to company’s own employees.

9. Temporary access groups

a. are used to temporarily expand the access of keys by associating them with a selection of access profiles. The access of a temporary access group is the combined access of the included access profiles during a time period that is defined with a start date and an end date. Start date defines the time when temporary access rights are available from remote programming devices and end date defines the time when access right removal tasks are downloadable. This feature should be used together with key revalidation to ensure keys are frequently updated. This feature is useful for example in a case where one or more maintenance technicians are on call and need temporary access for multiple sites during their shift.

10. Offline update

a. is a function that enables keys to be revalidated through a RemotePD even if the device has temporarily lost its network connection. This is useful in situations when it is critical that a key can get its validity extended even if the network connection is unstable. Updates of accesses cannot be made in offline mode. Offline Update is configurable per RemotePD.

11. Integrations

a. with a third party systems (like HR system, or an access control software) are possible through SOAP Web Services interface.

ADDITIONAL SERVICES PROVIDED BY ASSA ABLOY

ASSA ABLOY provides additional services to CLIQ™ Web Manager Installations. Below is the list of services that can be integrated with installations. All services are hosted by ASSA ABLOY.

Digital Content server

Digital Content Server (DCS) manages and delivers digital content, such as certificates, locking data, firmwares and software licenses to the CLIQ™ Web Manager installations in a secure manner. DCS is integrated automatically in all Abloy hosted CLIQ™ Web Manager environments. DCS can be integrated with customers own in-house installations as well. If an installation is not integrated with DCS, the digital content like certificates, locking data and software licenses can be downloaded from DCS using external admin accounts. Abloy will create DCS external admin accounts for all customers with own in-house installations.

Directory service

Directory service is an addition to DCS. It provides the correct CLIQ™ Remote server URLs as a service for remote programming devices and CLIQ™ Connect applications. This service enables plug and play functionality for remote programming devices, use of CLIQ™ Connect smartphone application to program CLIQ™ Connect keys and as well as use of CLIQ™ Connect PC application to program remote programming tasks for CLIQ™ keys. CLIQ™ Connect PC application is an alternative option for Java in CLIQ™ Web Manager Client PC.

CLIQ™ Connect update service

CLIQ™ Connect update service provides CLIQ™ Connect PC application software to CLIQ™ Web Manager client PCs.

INSTALLATION OPTIONS

Customer has two options in ordering CLIQ™ Web Manager software. Customer can either choose software as a services (SaaS) or own in-house installation option.

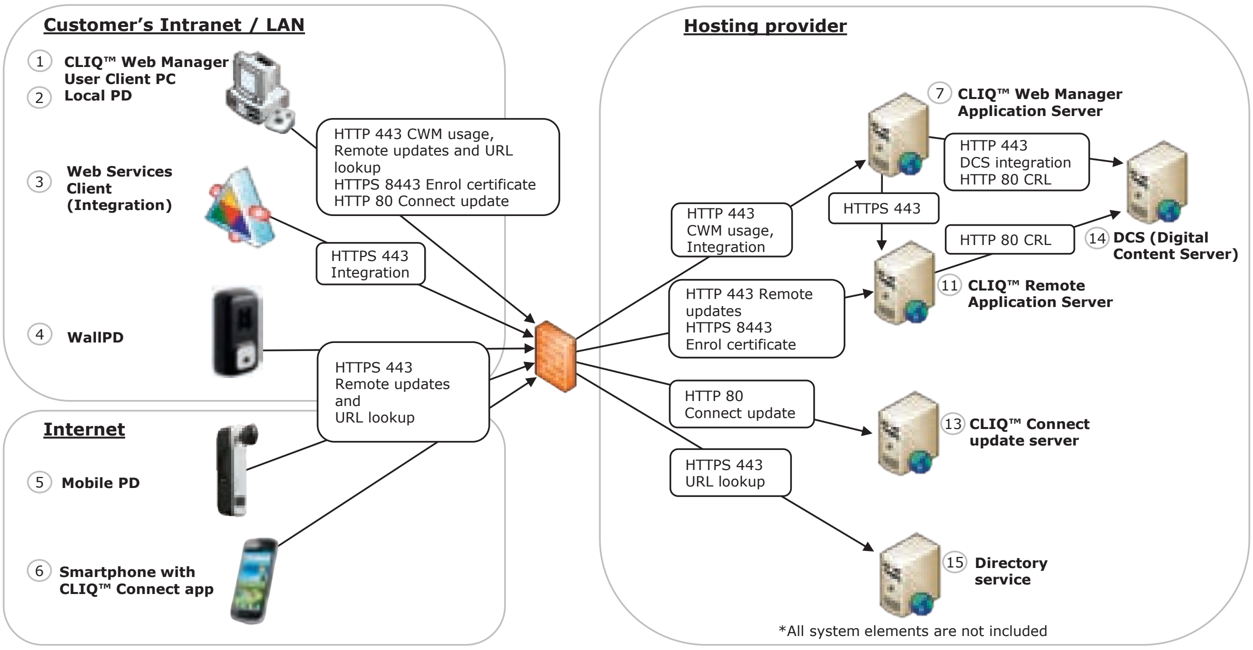
Software as a Service (SaaS)

Software as a Service means that installation and maintenance of CLIQ™ Web Manager environment is provided as a service by Abloy Oy. Software upgrades, backups of databases and importing extensions to locking system are done automatically. Customer only needs to setup network connections to CLIQ™ Web Manager and CLIQ™ Remote services and deploy client PC(s) for CLIQ™ Web Manager software usage.

Abloy hosted CLIQ™ Web Manager Environments:

- Service availability: 24/7, High-availability environment (SLA 99.9%, excluding planned maintenance)
- All CLIQ™ services are monitored 24/7
- Professional support available 24/7

Below picture presents the overview of software as a service setup. Customer's network and devices are found on the left side of the picture and hosting provider's environment is depicted in the right side. Please notice the required network connections and the direction of arrows pointing out where connections are initiated from the picture.


Customer's Intranet / LAN
1 CLIQ™ Web Manager User Client PC
2 Local PD
3 Web Services Client (Integration)
4 WallPD
Internet
5 Mobile PD
6 Smartphone with CLIQ™ Connect app
HTTP 443 CWM usage, Remote updates and URL lookup
HTTPS 8443 Enrol certificate
HTTP 80 Connect update
HTTPS 443 Integration
HTTPS 443 Remote updates and URL lookup
Hosting provider
7 CLIQ™ Web Manager Application Server
HTTP 443 DCS integration HTTP 80 CRL
HTTPS 443
HTTP 80 CRL
14 DCS (Digital Content Server)
HTTP 443 CWM usage, Integration
HTTP 443 Remote updates HTTPS 8443 Enrol certificate
11 CLIQ™ Remote Application Server
HTTP 80 Connect update
13 CLIQ™ Connect update server
HTTPS 443 URL lookup
15 Directory service
*All system elements are not included

Service	Example URL
CLIQ™ Web Manager	https://cwm02.abloy.com:443/CLIQWebManager
CLIQ™ Remote	https://remote02.abloy.com:443/CLIQRemote
Enrolment	https://remote02.abloy.com:8443/CLIQWebManagerEnrolment
CLIQ™ Connect Update server	http://cliqconnect.assaabloy.com

Abbreviation	Explanation
HTTP	Hyper Text Transfer Protocol
HTTPS	Hyper Text Transfer Protocol Secure
CRL	Certificate Revocation List
URL	Uniform Resource Locator

Note: It is possible to setup a proxy server between remote programming devices and CLIQ™ Remote server. Proxy settings are set up in CLIQ™ Web Manager user interface and configured to remote programming devices during deployment phase.

Software

Customer’s own in-house installation

CLIQ™ Web Manager system can be installed to customer’s own environment. Customer is then responsible of setting up, installing and maintaining the environment for CLIQ™ system, installing the software, taking regular backups of databases and other maintenance tasks such as software version updates and installing extensions.

Abloy will provide software installation packages including CLIQ™ certificates to customers. Certificates includes MKS specific certificates for each remote programming device and programming key and also certificates for installation. The certificate file for installation is called serverbundle.ccb. CLIQ™ Remote server’s hostname (e.g. CLIQ™remote.mycompany.com) is embedded to serverbundle file to make CLIQ™ installation more secure and use standard security methods. Therefore customer needs inform CLIQ™ Remote server’s hostname to Abloy before serverbundle file can be created and delivered to customer.

TLS certificates for CLIQ™ Web Manager

Customer needs to purchase or create third-party TLS certificates for CLIQ™ Web Manager application and CLIQ™ Web Manager Enrolment application. Both applications are accessed using web browsers from client PCs. TLS certificates needs to be issued by a certificate authority (CA) that is trusted by these web browsers; otherwise web browsers cannot authenticate the server. The users will by informed by a security warning that the server cannot be trusted. Enrolment application is used for fetching new certificates for programming keys and CLIQ™ Web Manager application is the management software. Enrolment application is installed if DCS integration is in use and is available from CLIQ™ Remote server.

It is highly recommended to get certificates issued by a CA that is trusted by default by the supported web browsers to avoid configuration at each client. Examples of such CAs are VeriSign, Comodo and RapidSSL and the product name for this type of certificate is usually “TLS certificate” or “SSL certificate”.

As the certificate must be issued to the correct server host name (Fully Qualified Domain Name, FQDN), e.g. “CLIQ™webmanager.mycompany.com”, it is only possible to order certificates from a CA if you are the legitimate owner of the domain used, in this example “mycompany.com”.

Address the CA of your choice for instructions on how to purchase TLS server certificates. TLS server certificates are required when installing and configuring CLIQ™ application on servers. Customer will need one certificate for CLIQ™ Web Manager application and one for enrolment application. In the ordering phase, it is required to mention FQDNs for both servers (e.g. CLIQ™webmanager.mycompany.com and CLIQ™remote.mycompany.com). Alternatively a wildcard / multidomain certificate can be used (e.g. *.mycompany.com) on both servers.

Below is the list of requirements for certificates

- Maximum length of FQDN is 81 characters
- Minimum RSA key length is 2048 bits
- Minimum signature hash algorithm is SHA-2/SHA256
- Supported formats are PKCS#1, Base64 and PEM (in cleartext, no encryption).
- Two files needed per server: TLS server certificate file and TLS private key file

System setup

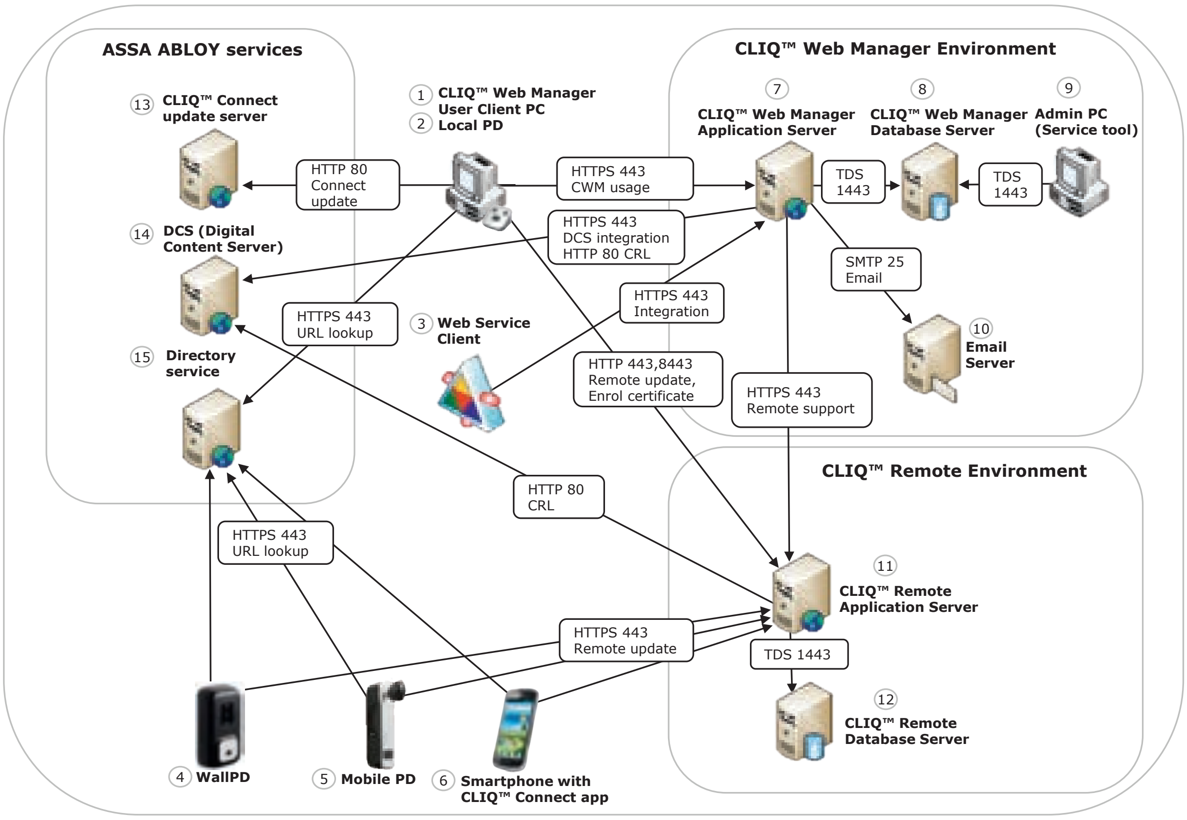
The recommended setup contains four dedicated servers: CLIQ™ Web Manager application server, CLIQ™ Web Manager database server, CLIQ™ Remote application server and CLIQ™ Remote database server. Servers can be either physical or virtual servers. The main reasons for having four dedicated servers are security, performance and reliability. Usually MobilePDs and CLIQ™ Connect applications will connect to CLIQ™ Remote service from Internet side, therefore CLIQ™ Remote service needs to be available from there. The suggested setup is to place CLIQ™

Remote environment (application + database) to DMZ while locating CLIQ™ Web Manager part to more secured Intranet (LAN). No CLIQ™ sensitive information is stored on the CLIQ™ Remote side.

Note!

- It is not supported to install databases to same server as the CLIQ™ Web Manager or CLIQ™ Remote application.
- CLIQ™ Web Manager and CLIQ™ Remote applications cannot be installed in the same server.
- Minimum setup is three dedicated servers, where both databases are installed in one database server. For large systems (>1000 system elements) there may appear performance issues, therefore this setup is not recommended.
- Both databases can be located in existing SQL cluster solution if available.
- Time synchronization of servers is important. All servers need to use the same system time and therefore shall be synchronized to a NTP (Network Time Protocol) server.

For security reasons it is recommended to use servers physically separated by firewalls to minimize the exposure of each node to unauthorized network traffic. An overview of the system is depicted in below picture. Please notice that direction of arrows shows where connections are initiated and that firewalls are discarded from picture.


ASSA ABLOY services
13 CLIQ™ Connect update server
14 DCS (Digital Content Server)
15 Directory service
1 CLIQ™ Web Manager User Client PC
2 Local PD
HTTP 80 Connect update
HTTPS 443 CWM usage
HTTPS 443 DCS integration HTTP 80 CRL
HTTPS 443 URL lookup
3 Web Service Client
HTTPS 443 Integration
HTTP 443,8443 Remote update, Enrol certificate
CLIQ™ Web Manager Environment
7 CLIQ™ Web Manager Application Server
8 CLIQ™ Web Manager Database Server
9 Admin PC (Service tool)
TDS 1443
TDS 1443
SMTP 25 Email
10 Email Server
HTTPS 443 Remote support
HTTP 80 CRL
CLIQ™ Remote Environment
11 CLIQ™ Remote Application Server
HTTPS 443 URL lookup
HTTPS 443 Remote update
TDS 1443
12 CLIQ™ Remote Database Server
4 WallPD
5 Mobile PD
6 Smartphone with CLIQ™ Connect app

Service	Example URL
CLIQ™ Web Manager	https://cwm.customer.domain.com:443/CLIQWebManager
CLIQ™ Remote	https://remote.customer.domain.com:443/CLIQRemote
Enrolment	https://remote.customer.domain.com:8443/CLIQWebManagerEnrolment
CLIQ™ Connect Update server	http://cliqconnect.assaabloy.com

Abbreviation	Explanation
HTTP	Hyper Text Transfer Protocol
HTTPS	Hyper Text Transfer Protocol Secure
CRL	Certificate Revocation List
URL	Uniform Resource Locator
TDS	Tabular Data Stream
SMTP	Simple Mail Transfer Protocol

Below is the list of system elements with explanations

1. CLIQ™ Web Manager User Client PC is used by administrators of CLIQ™ locking systems to access the CLIQ™ Web Manager software. CLIQ™ Web Manager software is accessed by using a web browser and a Java applet or CLIQ™ Connect PC application.
2. Local programming device (localPD) is connected to client PCs enabling access to CLIQ™ Web Manager softwares. The left key port of localPD is intended for programming keys and right port is for user keys.
3. CLIQ™ Web Manager software can be integrated with customers' own IT systems through SOAP Web Services interface.
4. Wall mounted programming device is intended for programming user keys and programming keys. These devices are connected to CLIQ™ Remote server.
5. Mobile programming device is similar to wall mounted programming device, except it is a handheld device and utilizes the data connection of the mobile phone by using Bluetooth technology.
6. Smart phone with CLIQ™ Connect application is used to program access right for CLIQ™ Connect keys.
7. CLIQ™ Web Manager application server is the key part of the system, where CLIQ™ Web Manager application is running. Two services are installed to this server: CLIQ™ Web Manager tomcat service and apache service. CLIQ™ Web Manager web application is available from this server.
8. CLIQ™ Web Manager database server contains the database for CLIQ™ Web Manager application.
9. Admin PC is intended for creating and updating CLIQ™ Web Manager and CLIQ™ Remote databases. CLIQ™ Web Manager database is managed by a software called Service Tool.
10. Email server is needed for sending email messages for key holders for example on pending key updates.
11. CLIQ™ Remote server application server handles key update tasks. Update tasks are created in CLIQ™ Web Manager and send to CLIQ™ Remote side until executed. Two services are installed to this server: CLIQ™ Remote tomcat service and apache service. By default there will be applications available from this server, CLIQ™ Remote web application and CLIQ™ Web Manager Enrolment application. Enrolment applications is only installed if CLIQ™ Web Manager system is integrated with DCS server. Enrolment application is used for fetching new certificates for programming keys.
12. CLIQ™ Remote database server contains the database for CLIQ™ Remote application.
13. CLIQ™ Connect update server is used for downloading the latest CLIQ™ Connect PC application to CLIQ™ Web Manager Client PCs.
14. Digital Content Server is managing and delivering digital content to CLIQ™ Web Manager installations.
15. Directory service is a background service for searching the correct service URL for CLIQ™ Remote server. RemotePDs and CLIQ™ Connect applications will use directory service automatically.

In the CLIQ™ Web Manager it is possible to setup proxy servers between the following system elements.

- Between CLIQ™ Web Manager server and Digital Content Server. This proxy is set up during CLIQ™ Web Manager installation on server via installer. Installation parameters can be changed afterwards.
- Between CLIQ™ Remote server and remote programming devices. Proxy settings are assigned in CLIQ™ Web Manager user interface and configured to remote programming devices during remotePD deployment phase.

Below is the summary of all network connections needed by CLIQ™ Web Manager system. Note that all connections are initiated by end point 1. SSL/TLS requires mutual authentication using client certificates. All connections must be end-to-end connections which cannot be terminated between.

NETWORK CONNECTIONS

END POINT 1	PROTOCOL / TCP PORT	END POINT 2	PURPOSE
User client PC	HTTPS / 443	CLIQ™ Web Manager server	CLIQ™ Web Manager user interface
Web Service client (Integration sw)	HTTPS / 443	CLIQ™ Web Manager server	Web Service calls
User client PC	HTTPS / 8443	CLIQ™ Remote server	Enrol programming key certificate
Remote programming device (WallPD or MobilePD)	HTTPS / 443	CLIQ™ Remote server	Programming tasks
Smartphone with CLIQ™ Connect application	HTTPS / 443	CLIQ™ Remote server	Programming tasks
CLIQ™ Web Manager server	TDS / 1443	CLIQ™ Web Manager database server	Database connection
CLIQ™ Web Manager server	HTTPS / 443	CLIQ™ Remote server	Establish remote functionalities
CLIQ™ Web Manager server	SMTP / 25	Email server	Email functionalities
CLIQ™ Web Manager server	HTTPS / 443	Digital Content Server (DCS)	Deliver digital content to installation
CLIQ™ Web Manager server	HTTP / 80	Digital Content Server (DCS)	Download certificate revocation list
CLIQ™ Remote server	TDS / 1443	CLIQ™ Remote database server	Database connection
CLIQ™ Remote server	HTTP / 80	Digital Content Server (DCS)	Download certificate revocation list
Admin PC	TDS / 1433	Database servers	Manage CLIQ™ databases
Remote programming devices, CLIQ™ Connect smartphone and PC applications	HTTPS / 443	Directory service	Searching correct URL for CLIQ™ Remote service
User client PC	HTTP / 80	CLIQ™ Connect update server	Downloading latest CLIQ™ Connect PC application

Monitoring

CLIQ™ Web Manager and CLIQ™ Remote services can be monitored from the applications log files, which can be found from servers.

- CLIQ™ Web Manager server
  - CLIQ WebManager.log from [installation folder]\tomcat\logs
- CLIQ™ Remote server
  - CLIQ Remote.log from [installation folder]\tomcat\logs

The following applications needs to be monitored from server side:

- CLIQ™ Web Manager server
  - Apache and CLIQ WebManager
- CLIQ™ Remote server
  - Apache and CLIQ Remote

High-Availability setup

To achieve highest possible service availability, it is possible to setup a high-availability (HA) environment for CLIQ™ Web Manager. HA environment contains the following.

- Two pairs of application servers, where one is active and another is passive at a time.
  - One pair consists of CLIQ™ Web Manager and CLIQ™ Remote servers.
- Database servers for both CLIQ™ Web Manager and CLIQ™ Remote. Databases can be installed to aSQL cluster.

It is important that applications in both servers pairs are not running at the same time, because applications in different server pairs are configured to use same databases (e.g. CLIQ™ Web Manager in server pair #1 is using the same database than CLIQ™ Web Manager in server pair #2.)

It is recommended that these server pairs should be located in different datacenters. At least to the level that if one datacenter goes down the other pair in other datacenter will continue to function.

Both CLIQ™ Web Manager and CLIQ™ Remote services require external IPs and FQDNs (fully qualified domain names) for customers to reach the services. It is needed to setup a routing policy that network traffic is routed always to the active server pair. In an active server there are Apache and CLIQ™ Web Manager (or CLIQ™ Remote) services running and in a passive server those services are stopped.

Service failover between an active and passive server pair needs to be done manually, CLIQ™ Web Manager software will not do this automatically. At first, shutdown services from an active server pair and then start services from passive pair. This is important in order to avoid database conflicts.

Please contact Abloy software services if you need more information on setting up a high-availability environment for a customer.

Maintenance

Abloy will release approximately two major versions of CLIQ™ Web Manager per year. Minor patch releases are published when needed. Abloy will support the current and two earlier major versions.
It is highly recommended to update operating system patches offered by Microsoft regularly to the servers.

Security

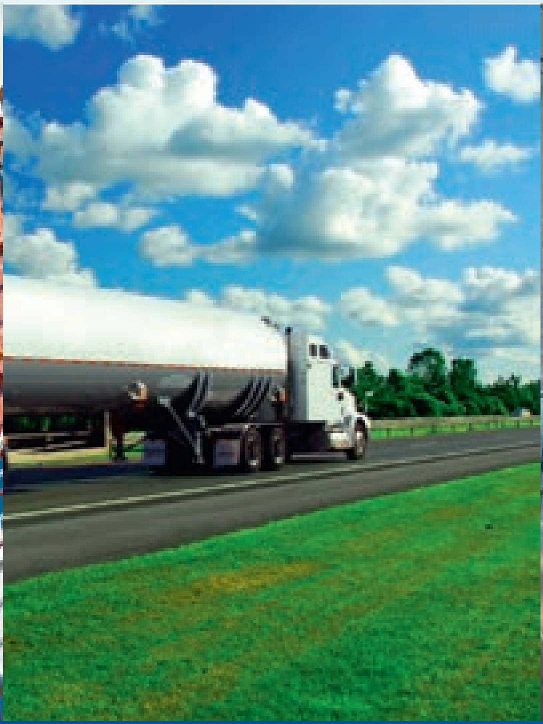
PROTEC² CLIQ™ security is based on mechanical key system combined with CLIQ™ electronic access rights. A CLIQ™ system can be mechanically keyed alike or masterkeyed, but all systems are still always mechanically different. On top of this, TLS certificates are used to authenticate elements of the system. All data between keys, cylinders, remote programming devices and CLIQ™ Web Manager is encrypted.
CLIQ™ elements are produced at the high security factory premises. All sensitive CLIQ™ data exported by the factory is encrypted, imported and stored centralized in the CLIQ™ Web Manager database. All business logic for handling CLIQ™ security is kept centralized in CLIQ™ Web Manager server. No CLIQ™ sensitive data is stored on the CLIQ™ Remote application server and therefore CLIQ™ Remote server can be used in the demilitarized zone (DMZ) recommended for external access.
The security of CLIQ™ Web Manager system is based on Public Key Infrastructure (PKI). It is used for the following reasons.

1. **Confidentiality: Encryption of data in transit and in rest**
   a. CWM needs to prevent an attacker from reading data sent over any network used including the Internet so that an attacker for example cannot give himself or someone else access to cylinders he should not be authorized to use.
   b. CWM needs to prevent an attacker from reading stored data used by CWM so that an attacker for example cannot give himself or someone else access to cylinders he should not be authorized to use. To do this CWM uses various encryption techniques and ciphers.
2. **Privacy: Encryption of private information**
   a. CWM needs to prevent an attacker from reading sensitive data such as employee information sent over any network used including the Internet so that an attacker for example cannot map employees to specific keys and work positions and so that personal integrity of employees isn't compromized.
3. **Integrity: Message tampering and corruption protection**
   a. CWM needs to be able to verify the integrity of data sent over any network used including the Internet so that CWM can be certain the data is authentic and not edited by an attacker or corrupted during transfer. This is required even though the data is encrypted since an attacker can still edit encrypted data and data can still be corrupted during transit.
4. **Authorization: Who can access**
   a. CWM needs to be in control of who can access, what can be accessed and at what time.
5. **Authenticity: Identification of sender**
   a. CWM needs to know the identity for all clients it communicates with so that CWM can use that data to verify that the client is authorized, for traceability in logs, installation separation and branding of CWM.

CLIQ™ Web Manager is using HTTPS/SSL/TLS protocols for encrypting the network traffic. Please see the network connections and used protocols from the previous section. Data between the CLIQ™ key and CLIQ™ lock and between CLIQ™ key and CLIQ™ Web Manager client are encrypted in 3DES.

DOUBLE

Telemedia



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Abloy Oy
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FI-80101 Joensuu | Finland
Tel. +358 20 599 2501
WWW.ABLOY.COM

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