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1. Preamble

The EPC and Cards Stakeholders published the SEPA Cards Standardisation Volume v7.0 (Issue Book 7.x¹.1.00 with reference EPC020-08) on 12 December 2013.

In its newsletter on 30 January 2014, the EPC clarifies the expectations on the impact of the "Standardisation Volume".

EPC Newsletter

SEPA FOR CARDS

EPC and Cards Stakeholders Group Publish the SEPA Cards Standardisation Volume Ready for Market Implementation

Stakeholders active in the SEPA cards domain are encouraged to align services and products with version 7.0 of the SEPA Cards Standardisation Volume by January 2017

30.01.14 BY UGO BECHIS

¹ "x" identifies the different books of the "Volume"



The concept of voluntary conformance with the SCS Volume

There is no legal obligation to implement the standardisation requirements detailed in the SCS Volume. Achieving conformance with the SCS Volume is a voluntary process. The CSG specifically opted for the concept of conformance rather than compliance considering that alignment in SEPA with the SCS Volume is a voluntary decision by players active in the cards domain, and is not an obligation. Voluntary conformance of players active in the SEPA cards domain with the standard requirements detailed in the SCS Volume is comparable to what was done in Europe to achieve migration to EMV. (EMV is an industry standard to implement chip and personal identification number (PIN) security for card transactions to combat fraud.) In 2004, the industry made the voluntary commitment to migrate cards, POS (i.e. terminals), and automated teller machines (ATMs) to EMV for security reasons. Given that there is no legal obligation to implement the standardisation requirements detailed in the SCS Volume, it is primarily expected that the various stakeholders represented in the CSG who approved the SCS Volume v 7.0 will implement the provisions themselves. The requirements have been defined through the consensus of experts designated by these stakeholders.

Conformance with the SCS Volume based on self-declaration

Conforming to the standardisation requirements detailed in the SCS Volume version 7.0 reflects the voluntary self-declaration of a player active in the cards domain. To illustrate this: if a terminal manufacturer decides that their products and services will conform to the SCS Volume (e.g. for commercial reasons), it implies that the manufacturer will undertake a process of alignment with all the relevant requirements that correspond to its activity. In this case, the manufacturer must ensure that the terminal passes the functional and security testing and certification processes necessary, as well as type approval by the card schemes. If and when a terminal meets the SCS Volume requirements based on these criteria, it may be termed 'Volume-conformant'.

Acquiris² is a not-for-profit member-based association and is active since years as the specifications provider of the interoperable C-TAP specifications and a certification provider. C-TAP is a detailed implementation specification that indicates how multi-brand and multi-acquirer payment terminals can be implemented and operated by the merchants and acquirers community. The C-TAP specifications satisfy the requirements of multiple brands, as well as the principles expressed in the EPC SEPA Card Framework. They have been defined and adopted by multiple acquirers, processors and vendors and about 450.000 terminals are deployed.

Acquiris now issues a voluntary conformance statement for the C-TAP specifications to clarify that implementations align with the SEPA Cards Standardisation Volume v7.0. In addition, these specifications offer functionality that matches with market requirements that have not yet been formulated in the "Volume".

2. Management Summary

The present document illustrates the conformance of the C-TAP specifications for POI connecting to acquiring host systems and the Acquiris role as "Specification provider" and "Certification Provider" with this "Volume".

As the development for C-TAP started in 2004 and reflects the actual market requirements of a broad community of merchants and acquirers, in some exceptional cases the indiscriminate volume conformity would result in a functionality that would not match with the needs expressed by the Acquiris members to the benefit of their customers and in compliance with the rules of the multiple schemes that these members process.

² See below and on www.acquiris.eu



Book 2 - Functional Requirements

This book is an essential element of the specifications as it lists in sufficient detail which functions and features a specification should cover to conform to the "Volume's" intentions.

The C-TAP implementation specification conforms to Book 2. There are deviations on some detailed items where the Volume's requirements do not match with the present market requirements as perceived by the Acquiris members. In one instance, a volume requirement will be implemented under the control of the Acquiris implementation specifications' management.

Book 3 - Data Elements and Book 3 - Data Element Spreadsheet

Acquiris is of the opinion that the application design takes precedence over definition of data elements and messages. The usage of these Data Elements is therefore mainly dictated by this application and those card scheme requirements that lead to the detailed design for this application. Data elements are shared in many cases between the cards applications, the terminal application and the multiple host acquiring systems to which terminals connect.

A common repository of data, such as delivered by Book 3, has its value as these data elements are also used by e.g. acquirers in their communication with issuers.

The data elements defined under ISO20022 CAPE are represented using the "BER-TLV data object syntax (see ISO/IEC 8825)"

All data elements of Book 3 that are relevant to the implementation specification are also integrated in the C-TAP data dictionary.

Book 4 - Security Requirements

The security principles guiding the Acquiris certification procedure are in most cases these imposed by major schemes to acquiring members. As a result, Acquiris developed innovative solutions to implement these requirements. They vastly overlap with what is what is formulated in Book 4. Some elements are highlighted below.

The C-TAP specifications and security requirements conform to Book 4. Acquiris members presently impose these security requirements emanating from major schemes. There is presently no members' mandate for EPC+, but it is expected that the EPC+ requirements will be integrated in the security requirements emanating from major schemes (PCI).

Book 5 - Conformance Verification Procedures

As indicated above, Acquiris is a not for profit member-based organisation with an open governance. Acquiris combines the management of implementation specifications and the certification process for POI. The certification process covers both security (members impose PCI certification, EPC+ is a regional option in addition to the Acquiris requirements) and the functional certification.



Implementation specifications cover the requirements of multiple technologies (contact, contactless, magnetic stripe) and multiple schemes. These C-TAP specifications could therefore be considered as scheme-independent.

Some schemes take part in the governance model; others are represented by the acquirers that signed up with these schemes.

Acquiris also manages the dissemination of operational data required to drive the multi-card schemes, multi-acquirer POI and provides a forum to actively monitor interoperability.

In addition, the industry-scale Acquiris model is field proven since years as members now operate about 450.000 POI and merchants can potentially accept more than 30 card brands on these terminals with multiple acquirers. The merchants decide which brands they accept and which acquirers will process them by simple configuration. Their configuration can be configured and modified at their will without affecting the POI hardware of applications.

The certification process described in Book 5 is more theoretical and will probably need more practical elaboration. It is different from the market practice of most schemes operating in SEPA. Vendors have no direct relations with most schemes and most schemes do not act as or operate through approval bodies. Acquiris presently operates under a delegation mandate providing the acquirers the assurance that terminals meet scheme requirements. Acquiris can also operate in a modus whereby vendors are granted a conformance statement that they can present to an approval body or scheme.

The C-TAP specifications management and certification process conform to Book 5. Acquiris would welcome a formal labelling process.



3. Conformance statement on Book 2

3.1 Preliminary remarks

3.1.1 Scope

The present conformance statement is issued for on-line POI operating on in "4 messages" mode, i.e. a first exchange between POI and acquiring host for authorisation and a second one for completion.

3.1.2 Functionality supported by the combination of the POI and the multiple acquiring host systems

The specification provider Acquiris is guided by a number of compelling drivers in the development of detailed and implementable specifications:

- **Market acceptance:** merchants and cardholders need to be satisfied by the actual implementation of a POI in terms of clarity, flexibility of usage, speed of execution and reliability;
- **Overall efficiency:** the actual split of processing between POI and acquiring host matches the capabilities and responsibilities of both sides efficient and the messaging limited to the essential, also in terms of message length;
- **Flexibility:** the implementation provides sufficient flexibility to allow a POI to support multiple brands with multiple acquirers to support the specific operational modes that a merchant might have agreed with these multiple acquirers to support multiple card brands and aligned with the respective scheme rules for these brands;
- **Broad coverage:** POI can operate in the straightforward context of a small shop accepting only payments, but the specification will also describe more complex processing required by e.g. multi-lane shops, hospitality or petrol filling stations. In addition, not only global credit and debit cards will be processed but also local brands, private label cards and cards for specific purposes, each in combination with the respective acquirers.

Book 2 provides a comprehensive description of functionality that is expected to be delivered by the combination of POI and the multiple acquiring hosts operations. It is left to the implementation specification providers to determine what part of the functionality is actually controlled by the POI and what is actuated by the acquiring host applications. Compliance for a criterion can be set to positive when the functionality is offered as described in the Book 2.

Based on the compelling drivers mentioned above the C-TAP specifications indicate how the POI operates and how the different acquiring host systems can control the correct execution of transaction processing.



3.1.3 Configuration at card brand level

Book 2 of the volume mentions:

Req T6:	It shall be possible to configure the Card Services, the Application Profiles and the Functions, when applicable. In particular it shall be possible to configure the POI Application to activate or deactivate specific Card Services and/or Functions.
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Reflecting the logic of a multi-brand and multi-acquirer POI, C-TAP has structured the configuration from the card brand downwards to the card services and the relevant data to configure these services.

This is a logical model:

- In line with the agreements between merchant and acquirer, the acquirer decides which brands to accept. As a result brand identifiers (AID pointing to card applications, BIN pointing to identifiers of magnetic stripe cards) will be positioned in the card recognition table to route transactions for these brands to the corresponding acquirers (or their processor) designated by the merchant. The different cards will be routed to the multiple corresponding acquirers or rejected if no acquirer has been designated.
- Each acquirer will indicate to the POI for each of the brands which card services are supported. This means that for a same brand one acquirer might support more or less services than another acquirer, again to reflect the specific agreements between merchant and acquirer.
- For each of these services the acquirer will fine-tune the operational parameters to align with e.g. risk management parameters and the agreements with the merchant. This means that for a same brand the transactional behaviour can be different from one acquirer to another acquirer.

All service configuration parameters are described in the C-TAP implementation specifications and it is the acquirer's responsibility to set the transactional behaviour in line with the corresponding card scheme rules.

3.1.4 Merchant preference for brand selection (optional functionality)

In countries with a prevalent acceptance of cards supporting multiple brands (co-branding), merchants might desire to influence the choice of a brand:

- To speed up the transaction at the point of sales by avoiding the often senseless question of which brand to use when the cardholder has no preference;
- As commercial conditions related to one brand might be different than those related to another co-branded brand.

C-TAP allows the POI to configure, if required by the merchant, a "merchant preferred brand" that will be selected by default when this brand is one of those present on a card. The cardholder will be informed of the brand that was selected. When this cardholder disagrees with the "automated" choice, this divergence will lead to the preparation of a candidate brands list from which one can be selected. The cardholder always has the last word for brand selection.



3.1.5 Contact and contactless

Some brands offer a combined contact and contactless functionality.

When the POI accepts both technologies, C-TAP will not steer the cardholder upfront to one or the other acceptance technology, other than by the strict application of scheme rules. For that purpose, acquirers have the possibility to position acceptance parameters by brand that can be different for contact and contactless.

This also allows shaping the service differently from brand to brand for combined acceptance, as scheme rules can be different.

3.1.6 No market demand for some functional requirements of Book 2

Acquiris has built up considerable market expertise as operations started in 2004 as national bodies in BE and NL. The specifications evolve in line with the members' requirements. The C-TAP implementation specifications drive presently about 450.000 POI and process more than 3 billions of transactions with about 30 brands. For some functional items listed in Book 2 the members of Acquiris presently see no market demand or experience that the actual market expectations are different.

For that reason, these functions have not yet been translated in detailed specifications. If there would be a need perceived by the Acquiris' members, the Acquiris Specification Management Board will complete the existing specifications to offer these extensions.

3.2 Conformance statement

The C-TAP specifications conform to Book 2.

There are deviations on some detailed items where the Volume's requirements do not match with the present market requirements as perceived by the Acquiris members.



4. Conformance statement on Book 3

4.1 *Preliminary remarks*

4.1.1 **Scope**

The present conformance statement is issued for on-line POI operating on in "4 messages" mode, i.e. a first exchange between POI and acquiring host for authorisation and a second one for completion.

4.1.2 **Detailed functional specifications take precedence over the definition of data element**

The Volume Book 3 states "The basis for the description of these Data Elements is the Acceptor to Acquirer messages as defined in CAPE. CAPE has been developed using ISO 20022 technology."

This statement might give the impression that the message exchange is independent from the detailed functional specifications developed to achieve Book 2 conformance and might result in the misleading conclusion that multiple Book 2 compliant specifications would guarantee - thanks to the conformance to book 3 - the interoperability of implementations originating from distinct specifications.

In addition, as Book 3 is mainly an enumeration of data elements that have been described independently from the development of detailed functional specifications that lead to the compliance of the POI with the Book 2 Functional Requirements, there is no such potential for interoperability. Once a specification provider starts to implement specifications the definition of the necessary data elements will follow as well as the corresponding message definition.

A "common" data repository such as provided in the Book 3 Data Elements displays what data are expected to be exchanged and specification providers can indicate that the effectively integrate these data in their specific data model and message flow.

Certainly for the case of Acquiris as provider of comprehensive set of detailed implementation specifications, there will be occurrences where data definitions are missing from the Book 3 tables as these do not yet reflect a more general market reality. The EPC has presently not prescribed how such situation should be resolved.

4.1.3 **ISO20022, XML and TLV**

ISO 20022 is an ISO Standard for Financial Services Messaging. It describes a Metadata Repository containing descriptions of messages and business processes, and a maintenance process for the Repository Content. The metadata is stored in a Unified Modelling Language models with a special ISO 20022 UML Profile. Underlying all of this is the ISO 20022 meta-model - a model of the models. The UML Profile is the meta-model transformed into UML. The metadata is transformed into the syntax of messages used in financial networks.



One syntax can be XML. Another can be BER-**TLV**. C-TAP selected the BER-**TLV** data object syntax (see ISO/IEC 8825). For each data element there are 2 or 3 consecutive fields:

- T: The tag field T consists of one or more consecutive bytes. It encodes a class, a type and a number.
- L: The length field consists of one or more consecutive bytes. It encodes an integer L.
- V: If L is not null, then the value field V consists of L consecutive bytes. If L is null, then the data object is empty: there is no value field.

TLV is judged to have a number of advantages:

- The communication between (EMV) smart cards and the POI is coded in TLV and some EMV-TLV data elements have to be forwarded to the acquirer and beyond;
- Neither TLV nor XML are have a standard on legacy systems, but with the 1996 introduction of EMV there is abundant TLV literacy for system developers;
- Equally to XML, TLV allows to add data elements and data structure with all flexibility;
- TLV is judged to be far more compact, which remains an advantage in a business where transactions are processed by the billions (less load on data networks, less storage for logging and tracing).

4.1.4 No time-stamping by intermediate agents

The CAPE model foresees in a multiple-step transmission of messages from the POI to an acquirer. The Acquiris members presently do no manage such configurations. In addition C-TAP has an end-to-end security concept and intermediate additions of timestamps would lead to vulnerabilities

- Time stamping over multiple elements requires time synchronisation which is difficult to achieve between multiple entities. C-TAP considers that only the acquiring host time is reliable and binding.
- Time stamps need to either transported outside the secure part of the message or managed a point-to-point security by multiple security domains, where some are outside the control of the acquirers.

This feature is not presently supported, as members perceive no market demand.



4.2 Conformance statement

4.2.1 Methodology

Starting from the "EPC020-08 Book 3 - Data Element Spreadsheet - SCS Volume v7.0", Acquiris indicates, for each data element, if it is also supported by the C-TAP Data Dictionary.

4.2.2 Conclusion

The relevant data elements that the C-TAP implementation specifications require to provide the functionality described in Book 2 are conformant to their description in Book 3.

5. Conformance statement on Book 4

5.1 Preliminary remarks

5.1.1 Mission statement and methodology

The acquiring and processing members of Acquiris are subject to security requirements imposed by the card scheme for which they offer acquiring services.

Acquiris acts, for these members, as a specification and certification provider.

As specification provider, Acquiris includes detailed requirements and specifications into C-TAP that relate to security:

- POI initial loading
- POI and acquiring hosts mutual authentication
- Message security
- Cardholder data protection
- PIN security

As certification provider, Acquiris will have verified if, according to the scheme rules imposed on acquirers, the POI have been certified by the relevant global bodies and that the C-TAP specific detailed specifications have been correctly implemented by the POI:

- Common scheme requirements are the POI certification of EMV kernels by EMVCo, the contactless kernels by their respective schemes, the relevant PCI certifications;
- The C-TAP specific detailed specifications, including those related to security, are certified as part of the functional acceptance test;
- Acquirers might have to organise end-to-end (i.e. POI vs. a specific acquiring host system) according to scheme rules. This is presently out of scope for Acquiris;
- EPC+ is not a present requirement from acquiring members, but compliance criteria could be



added if requested by members. In addition it is assumed that the EPC+ requirements will gradually be integrated in the relevant PCI requirements.

In addition, Acquiris is also operating a "Public Key Certification Authority" (CA) to support the two main message security methodologies that are made available to acquirers. The CA operation is also subject to PCI compliance.

5.2 Conformance statement

The EPC security requirements formulated by the EPC widely overlap with those of (global) schemes.

It is an Acquiris requirement that POI implementing C-TAP will be certified by the relevant certification bodies such as EMVCo and PCI SSC before commercial operation. This means that they will be compliant with the EPC Book 4 requirements, with the exception of those marked as EPC+, for which none of the present acquirers issued a mandate. It is assumed that the EPC+ requirements will gradually be integrated in the relevant PCI requirements creating a mandate for their support.

C-TAP has developed a number of methodologies that provide message and cardholder data security that conform to the Book 4 requirements, as well as to the (global) scheme rules imposed to the acquirers.

In addition, Acquiris is also operating a "Public Key Certification Authority" (CA) to support the two main message security methodologies that are made available to Acquirers. **The CA is also subject to PCI compliance.**

6. Conformance statement on Book 5

6.1 Preliminary remarks

6.1.1 The Acquiris Certification Process

The Acquiris certification process aligns with the Volume requirements in a large members' community accepting and processing multiple schemes.

Scheme requirements are passed by the acquirers or their processors to Acquiris. As "Implementation Specification Provider" Acquiris integrates these requirements in the detailed specifications and as "Certification Body" the Acquiris certification process guarantees that what was specified is also implemented. This certification process is also contractually agreed with vendors and mandates certifications by external bodies such as EMVCo or PCI SSC within their domain of competence as well as the extensive testing by accredited test labs to establish the conformance with the relevant detailed implementation specifications.

The Volume assumes that there will be a direct and contractual relation between schemes (acting as approval body) and POI vendors. However, most (global) schemes do not operate such approval



body and mandate the acquiring members to enforce the scheme rules that relate to POI operation. Acquiris operates on a representation of the scheme requirements by its members acquiring these schemes. This "multi-scheme" mode of operation is the most apt to provide a single-process POI certification in a multi-scheme and multi-acquirer environment.

However, if schemes want such direct relations, the Acquiris model is still valid:

- Schemes recognise Acquiris as specification and certification provider
- The vendor can provide a valid certificate to the scheme he signed up with and the scheme's approval body can dispense an "approval" to the vendor.

6.1.2 The labelling process

Acquiris is of the opinion that a labelling process, as described in the executive summary, will be useful to the community of parties involved in a SEPA for cards. As this process will confirm that a given implementation specification is in line with the Volume requirements. It will provide stakeholders with a simple statement of conformity between the Volume's requirements and intricate and complex technical specifications. On this basis this stakeholders can select on the basis of their requirements and business environment which specifications match with their expectations in full assurance the underlying solutions can be deployed for the schemes they pursue.

6.2 Conformance statement

6.2.1 Acquiris as certification body

Acquiris conforms to the EPC requirements as expressed in Book 5.

6.2.2 Acquiris as specification provider

Acquiris conforms to the EPC requirements as expressed in Book 5.

6.2.3 The Volume labelling process

Acquiris is prepared and would welcome to apply for a "label" as described in the Volume.



6.2.4 Acquiris operates today in an industrial reality

Acquiris acquired a legal identity and is a member-based organisation that:

- Operates as a specification provider to its members;
- Acts as a certification body – and as global schemes do not (yet) support the function of approval body and delegate this responsibility to their acquiring members (which in turn devolve this to Acquiris);
- Could apply for an SCCMB “label” once the assorted process has been defined and agreed;
- Operates effectively these functions under one roof at industrial scales since the consolidation year and before since 2004 as country based entities.

Acquiris is conformant to the Book 5 requirements

Acquiris is looking forward to the establishment of an SCCMB and the wide support of schemes for the proposed model.



7. More about Acquiris and C-TAP

7.1 *The Acquiris association*

Acquiris a.i.s.b.l. is the payment terminal specification and certification body within the SEPA region.

In close co-operation with stakeholders, Acquiris keeps the specifications under its management in line with market demands and technological developments. The certification process guarantees to all parties in the payment value chain that terminals deployed are in conformity with the specifications. For more information is referred to the Objectives page.

Currently Acquiris is managing the C-TAP (Common Terminal Acquiring Protocol) Specifications. C-TAP is currently the only SEPA-proof payment terminal specification which is deployed in several European countries. C-TAP is used in over 450.000 payment terminals across Europe.

Acquiris is a not-for-profit, independent membership-driven organisation with an open Governance.

C-TAP is the abbreviation of Common Terminal Acquirer Protocol. The C-TAP specifications describe:

- The exchange of information with payment cards of various technology and how these cards are recognised
- The detailed flow for various types of transaction processing
- The association of a recognised card with an acquirer that will authorise and settle the transaction
- The data exchange with this processor
- The message and information processing requirement at the acquirers' host system

In more detail, the C-TAP specifications indicate:

- Storage and management of card recognition criteria and multiple sets of instructions delivered by individual acquirers having a relationship with the merchant
- The sequence of interactions with EMV smart cards on top of the EMV Level 1 and Level 2 specifications, as well as the reading of ISO tracks on magstripe cards
- The support of the various CVM (Cardholder Verification Method) as instructed by the issuer of the card in combination with the directions delivered by the acquirer: clear text or encrypted PIN verified by the smart card, encryption and on-line verification of a PIN, signature or no CVM
- The support of various modes of operation: on-line, semi-on-line and off-line

A range of solutions guarantee message integrity and data protection.

More information and details are available on www.acquiris.eu.



7.2 Business requirements driving the C-TAP specifications

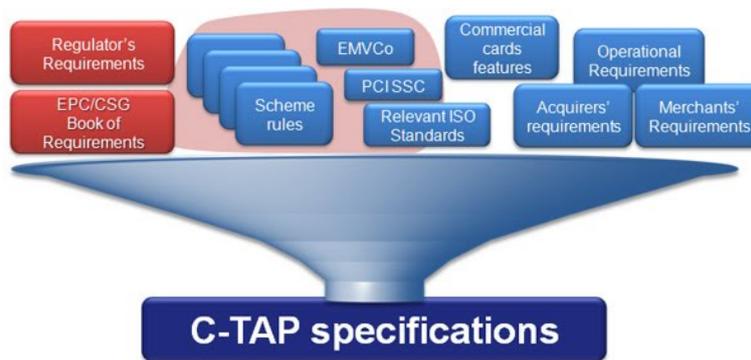
<p style="text-align: center;">Leading Requirement</p> <p style="text-align: center;">Reflect the arrangements a merchant made with one or more acquirers for card acceptance of one or more brands on a standardised payment terminal infrastructure</p>	<p>C-TAP delivers a terminal specification that allows multi-acquirer multi-brand card transaction processing.</p> <p>Acquiris manages card selection criteria and the acquirers' connectivity data. These are remotely loaded to terminals. The merchant selection of brands and acquirers is stored in the terminal for immediate card recognition. Each acquirer can customise its transaction flow.</p>
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Business requirements	What Acquiris & C-TAP deliver
<p>Provide specifications that describe how chip, mag-stripe and contactless cards and NFC smartphones interface with the terminal application.</p>	<p>Interfaces to the kernel specification provided by EMVCo and, for contactless payments, by the major schemes.</p>
<p>Provide specifications that describe how card transactions are initiated and processed by following, where suitable, the consensus on functional specifications of a group of experts and expressed in the EPC/CSG "Book of requirements".</p>	<p>C-TAP provides detailed specifications for transaction processing, of which the most important are:</p> <ul style="list-style-type: none"> • attended and unattended terminals • multiple card data capture and cardholder validation methods • direct and deferred (petrol) payments • on-line and off-line modes of operation • payments, partial approval, cash advance, pre-authorisation, update pre-authorisation, payment completion, card validity check, cancellation, refund, voice referral, back-up modes • direct currency conversion <p>The transaction business logic is described for the terminal as well as for the message handling system of the acquiring hosts.</p>
<p>As an individual terminal connects to multiple acquirers, each acquirer must be in position to safely load the acquirer specific symmetric keys to this terminal for on-line PIN transmission and message authentication.</p>	<p>C-TAP provides a mechanism to safely load multiple sets of keys to terminals under the control of the acquirer and the support of a Security Provider function</p>



<p>Even if the transactional business logic is leading, the message flow between a terminal and the multiple acquiring hosts must be precisely described, preferably relying on international standards.</p>	<p>The C-TAP specifications rely on a central data dictionary. Data fields and messages are presently described using the Tag-Length-Value methodology also used by EMVCo (ISO/IEC 8824-1 and ISO/IEC 8825-1). Alternate representations, such as ISO 20022 can be considered, relying e.g. on the registrations of EPASOrg with ISO.</p>
<p>Terminals can connect to acquirers using multiple telecommunication channels.</p>	<p>The C-TAP specifications support PSTN, ISDN, GSM, broadband internet, virtual private networks, GPRS ...</p> <p>IP connectivity can be protected by TLS/SSL3 mutual authentication.</p>

7.3 Functions and services



<p>Multiple configurations</p> <ul style="list-style-type: none"> • Terminal with or without separate merchant unit • Terminals without Pinpad (No cardholder validation) <ul style="list-style-type: none"> ○ contact ○ magnetic stripe (magstripe) ○ contactless • Terminals in attended or unattended mode <p>Multiple Card entry modes</p> <ul style="list-style-type: none"> • Manual Entry • Magstripe • EMV contact 	<p>Services</p> <ul style="list-style-type: none"> • Payment • Payment at Voice Referral • Cash Advance • Cash Advance at Voice Referral • Card Validity Check • Resubmission • Pre-Authorisation • Update Pre-authorisation • Payment completion • Refund • Deferred Payment (including transmission of fuel types and volumes) • Cancellation • Back-up mode (temporary local)
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<ul style="list-style-type: none">• Contactless<ul style="list-style-type: none">○ Multiple form factors (card, smartphone ...)○ EMV contactless○ PayPass○ PayWave○ Expresspay <p>Card and cardholder verification</p> <ul style="list-style-type: none">• EMV SDA, DDA and CDA card authentication• No CVM, signature, local PIN validation• Contactless on-device PIN• On-line PIN <p>Cardholder and merchant guidance</p> <ul style="list-style-type: none">• Multilingual – driven by card's language (if available) and merchants language• Driven by the acquirer <p>Driven by common parameters and acquirers' business rules</p> <ul style="list-style-type: none">• Terminal management system load card recognition data and acquirers' connectivity data <p>Acquirers customise the transaction flow and processing options parameters</p>	<p>authorisation activated by merchant when connectivity with acquirers is lost)</p> <ul style="list-style-type: none">• Management functions: balances and financial counters <p>Additional Functions</p> <ul style="list-style-type: none">• Partial Approval• Product Selection• Dynamic Currency Conversion (DCC)• Extra amount• Shop / petrol products• Terminals with local authorisation capabilities• Token recognition to link e.g. pre-authorisation and payment completion• Merchant activated PIN entry bypass• No-CVM required limit• Cash-back• Site management• Application pre-selection <p>Additional Data (e.g. for petrol cards)</p>
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