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TECHNICAL SPECIFICATION

**Smart cards;
UICC-Terminal interface;
Internet Protocol connectivity between UICC and terminal
(Release 9)**

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Introduction

The present document defines how an Internet Protocol connection may be established between a UICC and a terminal connected through a UICC-Terminal Interface able to carry Internet Protocol packets, and how the UICC resources defined in ETSI TS 102 221 [11] may be accessed over this connection. Most telecommunication infrastructures rely on the Internet Protocol and therefore telecommunication terminals commonly implement the IP layers as standardized by the IETF RFC 791 [1] and by the new version in IETF RFC 2460 [7]. Connecting the UICC and the terminal at this level is expected to bring the following advantages:

- Leverage on existing standardization efforts: Applicative protocols relying on IP, e.g. running over TCP or UDP, have already been standardized for a wide variety of applications and may be used by UICC applications.

- Minimize UICC-specific developments on the terminals; reuse what is already available on terminals rather than forcing specific developments.

- Facilitate connectivity of the UICC with standard network elements such as remote servers, etc.

The present document focuses on the establishment and configuration of a generic IP connection between the UICC and terminal, without addressing specific applications that may use this connection capability.

1 Scope

The present document specifies the establishment and configuration of an Internet Protocol connection between a UICC and a terminal interfaced through a protocol that supports the transport of Internet Protocol packets.

The way the Internet Protocol packets (or similar packets such as ARP) are transported over the UICC-Terminal interface is part of the UICC-Terminal interface specification and not within the scope of the present document. The present document focuses on the configuration and establishment of the Internet Protocol connection between the UICC and the terminal.

The Internet Protocol connectivity defined in the present document may be used by applications such as the Smartcard Web Server [i.7].

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- In the case of a reference to a TC SCP document, a non specific reference implicitly refers to the latest version of that document in the same Release as the present document.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference/.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] IETF RFC 791: "Internet Protocol".

NOTE: Available from http://www.ietf.org/rfc/rfc791.txt.

[2] IETF RFC 826: "An Ethernet Address Resolution Protocol".

NOTE: Available from http://www.ietf.org/rfc/rfc826.txt.

[3] IETF RFC 792: "Internet Control Message Protocol".

NOTE: Available from http://www.ietf.org/rfc/rfc792.txt.

[4] IETF RFC 793: "Transmission Control Protocol".

NOTE: Available from http://www.ietf.org/rfc/rfc793.txt.

[5] IETF RFC 2449: "POP3 Extension Mechanism".

NOTE: Available from http://www.ietf.org/rfc/rfc2449.txt.

[6] IETF RFC 1122: "Requirements for Internet Hosts - Communication Layers".

NOTE: Available from http://www.ietf.org/rfc/rfc1122.txt.

[7] IETF RFC 2460: "Internet Protocol, Version 6 (IPv6)Specification".

NOTE: Available from http://www.ietf.org/rfc/rfc2460.txt.

[8] IETF RFC 2463: "Internet Control Message Protocol (ICMPv6)for the Internet Protocol Version 6 (IPv6) Specification".

NOTE: Available from http://www.ietf.org/rfc/rfc2463.txt.

[9] IETF RFC 3022: "Traditional IP Network Address Translator (Traditional NAT)".

NOTE: Available from http://www.ietf.org/rfc/rfc3022.txt.

[10] IETF RFC 3314: "Recommendations for IPv6 in Third Generation Partnership Project (3GPP) Standards".

NOTE: Available from http://www.ietf.org/rfc/rfc3314.txt.

[11] ETSI TS 102 221: "Smart Cards; UICC-Terminal interface; Physical and logical characteristics (Release 7)".

[12] IETF RFC 4861: "Neighbor Discovery for IP Version 6 (IPv6)".

NOTE: Available from http://www.ietf.org/rfc/rfc4861.txt.

[13] IETF RFC 4862:"IPv6 Stateless Address Autoconfiguration".

NOTE: Available from http://www.ietf.org/rfc/rfc4862.txt.

[14] IETF RFC 4294: "IPv6 Node Requirements".

NOTE: Available from http://www.ietf.org/rfc/rfc4294.txt.

[15] IETF RFC 4291: "IP Version 6 Addressing Architecture".

NOTE: Available from http://www.ietf.org/rfc/rfc4291.txt.

[16] IETF RFC 2136: "Dynamic Updates in the Domain Name System (DNS UPDATE)".

NOTE: Available from http://www.ietf.org/rfc/rfc2136.txt

[17] IETF RFC 1035: "Domain names - Implementation and Specification".

NOTE: Available from http://www.ietf.org/rfc/rfc1035.txt

[18] IETF RFC 3490: "Internationalizing Domain Names in Applications (IDNA)".

NOTE: Available from http://www.ietf.org/rfc/rfc3490.txt

[19] IETF RFC 2131: "Dynamic Host Configuration Protocol".

NOTE: Available from http://www.ietf.org/rfc/rfc2131.txt.

[20] ETSI TS 102 600: "Smart Cards; UICC-Terminal interface; Characteristics of the USB interface".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] IETF RFC 2060: "Internet Message Access Protocol", version 4rev1.

NOTE: Available from http://www.ietf.org/rfc/rfc2060.txt.

[i.2] IETF RFC 2246: "The TLS Protocol", version 1.0.

NOTE: Available from http://www.ietf.org/rfc/rfc2246.txt.

[i.3] IETF RFC 2616: "Hypertext Transfer Protocol - HTTP/1.1".

NOTE: Available from http://www.ietf.org/rfc/rfc2616.txt.

[i.4] IETF RFC 959: "File Transfer Protocol (FTP)".

NOTE: Available from http://www.ietf.org/rfc/rfc959.txt.

[i.5] IETF RFC 821: "Simple Mail Transfer Protocol".

NOTE: Available from http://www.ietf.org/rfc/rfc821.txt.

[i.6] IETF RFC 1034: "Domain Names - concepts and facilities".

NOTE: Available from http://www.ietf.org/rfc/rfc1034.txt.

[i.7] OMA-TS-Smartcard-Web-Server-V1-0.

NOTE: Available from http://www.openmobilealliance.org.

[i.8] IETF RFC 768: "User Datagram Protocol".

NOTE: Available from http://www.ietf.org/rfc/rfc768.txt.

[i.9] ETSI TS 102 223: "Smart Cards; Card Application Toolkit (CAT)".

[i.10] IETF RFC 4632: "Classless Inter-domain Routing (CIDR): The Internet Address Assignment and Aggregation Plan".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the following terms apply:

application: computer program that defines and implements a useful functionality on a smart card or in a terminal

NOTE: The term may apply to the functionality itself, to the representation of the functionality in a programming language, or to the realization of the functionality as executable code.

file: directory or an organized set of bytes or records in the UICC

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ARP	Address Resolution Protocol
ASCII	American Standard Code for Information Interchange
DHCP	Dynamic Host Configuration Protocol
FTP	File Transfer Protocol
HTTP	HyperText Transport Protocol
ICMP	Internet Control Message Protocol
IMAP	Internet Message Access Protocol
IP	Internet Protocol
NAT	Network Address Translation
POP	Post Office Protocol
HTTPS	Secure HyperText Transport Protocol
SMTP	Simple Mail Transfer Protocol
TCP	Transmission Control Protocol
TLS	Transport Layer Security
UDP	User Datagram Protocol
URI	Universal Resource Identifier

4 Terminal-UICC IP configuration

4.0 General

This clause is an introduction to the various configurations and uses of the IP UICC. A UICC supporting IP will be deployed with at least a local address. This address relates to a private network established between the UICC and the terminal, independently from other networks to which the terminal may be connected.

The UICC shall be able to act as a combination of the following basic configurations:

- A TCP/IP or UDP/IP client of a server located on the terminal.

- A TCP/IP or UDP/IP server for a client located on the terminal.

- A TCP/IP or UDP/IP client of a server located in a network reachable through the terminal.

- A TCP/IP or UDP/IP server for a client located in a network reachable through the terminal.

Depending on the final applications, the actual configuration may be a combination of these basic configurations.

In the present document, the wording TCP/IP or UDP/IP protocol includes any application protocol such as HTTP, FTP, POP, SMTP that may be enabled by TCP or UDP, i.e. the configuration targeted is not restricted to having a web server and web client on the card.

4.1   Local client on UICC

In this configuration the UICC is a client for TCP/IP servers located on the terminal. This configuration is the simplest and does not require any routing or address translation. It requires however naming resolution inside the UICC, so that the UICC applications can resolve the server IP address from the terminal name (localterminal).
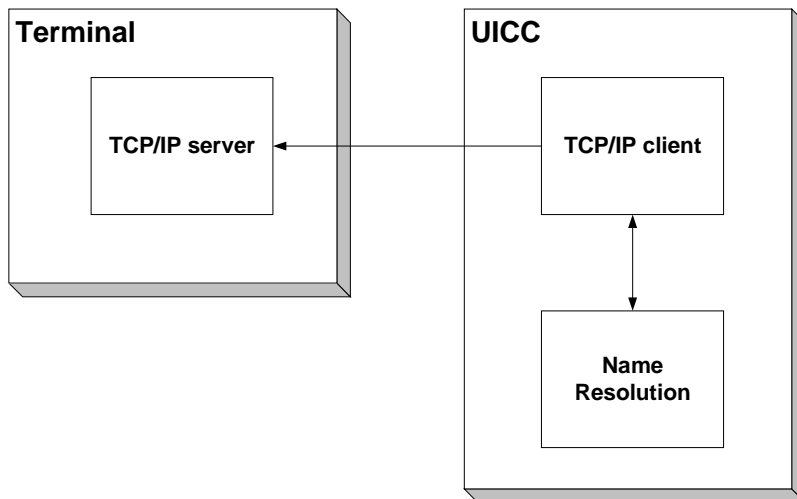
Figure 1: Local TCP/IP Client on UICC

4.2   Local server on UICC

In this configuration the UICC is a local server for a TCP/IP protocol, e.g. HTTP. The server is accessed only from the terminal. This configuration requires proper configuration of the terminal naming services, so that the terminal can resolve the UICC name (localuicc) to the UICC IP address.
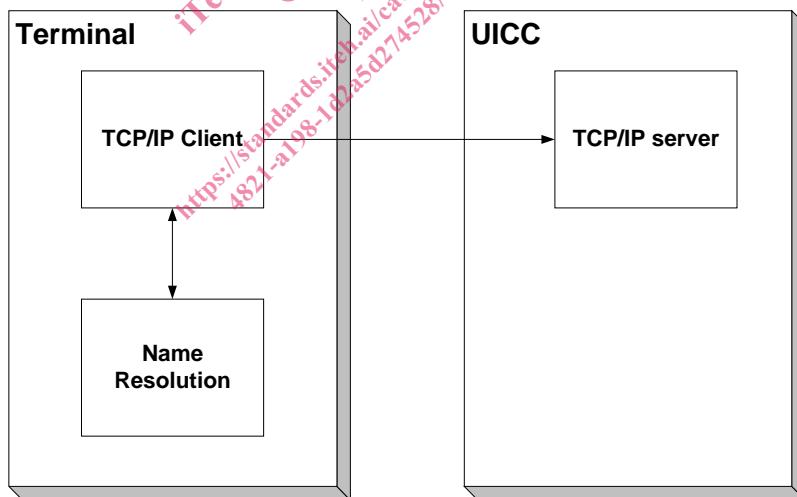
Figure 2: Local TCP/IP server on UICC