

# WITHDRAWN

IEEE Std 1390™-1995 (Withdrawn 2006)

## IEEE Standard for Utility Telemetry Service Architecture for Switched Telephone Network

Sponsor

**IEEE Standards Coordinating Committee 31  
on  
Automatic Meter Reading and Energy Management**

Withdrawn 3 February 2006  
**IEEE-SA Standards Board**

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The Institute of Electrical and Electronics Engineers, Inc.  
3 Park Avenue, New York, NY 10016-5997, USA

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ISBN 1-55937-578-7

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**Abstract:** This standard describes a utility telemetry service architecture operated over the telephone network. The architecture described is a basic transport architecture capable of supporting many different applications. The text is described in terms of a utility meter reading application, but any enhanced service provider (ESP) communication can be transported. Telemetry calls may be initiated by either the utility/service provider (outbound) or the telemetry interface unit (TIU)/CPE (inbound) on the end user's premise.

**Keywords:** automatic meter reading, telemetry, energy management, enhanced service provider, meter reading, telephone network, utility communication

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## Introduction

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## IEEE Standard for Utility Telemetry Service Architecture for Switched Telephone Network

### 1. Overview

#### 1.1 Scope

This standard describes a utility telemetry service (UTS) architecture operated over the switched telephone network. The UTS architecture described is a basic transport architecture capable of supporting many different applications. Telemetry calls may be initiated from either the utility/enhanced service provider (ESP) or the telemetry interface unit (TIU) on the end user's premise. The two access methods defined for this service are

- Central office service unit (COSU) access method and
- Direct dial access method

The two TIU transmission methods defined for this service are

- Off-hook transmission method and
- On-hook transmission method

The architecture covered in this standard is described in terms of a basic utility meter reading/controlling service. However, any number of other applications can be delivered using the telemetry transport service. These other applications are not covered in this standard.

#### 1.2 Purpose

The purpose of this standard is to provide a generic architecture under which the telecommunications interfaces and functionality of the Utility Telemetry Service will be defined. This architecture will provide to utilities a facility that is readily available, has short set-up times, and allows for automatic meter reading using the capabilities of the switched telephone network. This architecture can be used for a multitude of different transport applications.

### 2. References

This standard shall be used in conjunction with the following publications. When the following standards are superseded by an approved revisions, the revision shall apply:

ANSI T1.401-1993, Telecommunications—Interface between Carriers and Customer Installations—Analog Voicegrade Switched Access Lines Using Loop-Start and Ground-Start Signaling.<sup>1</sup>

ANSI T1.407-1990, Telecommunications—Interface between Carriers and Customer Installations—Analog Voicegrade Special Access Lines Using Customer-Installation Provided Loop-Start Supervision.

<sup>1</sup>ANSI publications are available from the Sales Department, American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036, USA.

### 3. Definitions

Terms used in this document are applicable only to the subject of this standard.

**3.1 automatic number identification (ANI):** The local or inter-lata billing number of the calling party.

**3.2 abbreviated ringing:** A short variable burst of power ringing that is required to establish a temporary communications path in certain types of network pair gain equipment. The switch is instructed, via trunk signals, to output this abbreviated ringing.

**3.3 alert tone:** A non-power ringing tone, or combination of tones, used to request the TIU or CPE to become active.

**3.4 alert tone code:** A data byte from the utility controller that identifies which alert tone is to be used by the COSU.

**3.5 automatic call distribution (ACD):** A service that evenly distributes calls among incoming end user lines.

**3.6 central office service unit (COSU):** A telephone company controller resident in a central office that connects to the utility controller and, via the utility telemetry trunk, to the switch. The COSU provides the function of originating and terminating calls to and from TIUs. For the COSU access method, the COSU performs a security check with the utility controller and places a call to the end user in response to the information sent to it by the utility controller. The COSU performs a security check and initiates a connection to the utility controller when called by the TIU. The COSU also provides a multiplexing interface between the utility controller & the COSU and the COSU & TIU(s). The COSU may also provide traffic measurements.

**3.7 central office service unit (COSU) access method:** An access method that utilizes the switched telephone network, comprised of a COSU, switch, and other network elements, which in combination provides for automatically invoking/ignoring certain switch-based telemetry communications capabilities and establishes a communications path between a utility/ESP and a TIU.

**3.8 CPE active state:** A state in which the CPE performs a communications functions.

**3.9 CPE inactive state:** A state in which the CPE does not perform a communications function.

**3.10 call-type information (CTI) digits:** CTI digits that are sent to the switch from the COSU via signaling on the utility telemetry trunk, per call, which specify the CPE transmission interface (i.e., on-hook or off-hook operation). These information digits are assigned, on a trunk group basis, through the switch administration procedures.

**3.11 customer premise equipment (CPE):** Equipment located on the customer's premise that is connected to the telephone line (e.g., TIU, telephones, answering machine, modems).

**3.12 cut-through:** A transmission path through the switched telephone network to an end user.

**3.13 digital loop carrier (DLC):** Equipment that increases the number of end users served by existing loop side pairs by the use of digital multiplexing. These concentration systems are often called pair gain devices. Both universal and integrated DLCs may be used.

**3.14 direct dial access method:** An access method that utilizes the switched telephone network, comprised of a switch and other network elements that provides for establishing a communications path between a utility/ESP and a TIU.

**3.15 enhanced service provider (ESP):** A service provider offering services through the telephone network using the telemetry transport capabilities to deliver their services.

**3.16 in-band tones:** Typically, a signal on the communications path in the range of 400 Hz to 3300 Hz.

**3.17 inbound telemetry:** Communications initiated by a TIU towards a utility or ESP.

**3.18 independent telephone company:** A company not associated with a regional Bell operating company. *Syn.*: non-Bell operating company.

**3.19 local area transport area (LATA):** An area typically served by a regional Bell operating company (RBOC).

**3.20 local loop:** The communications path between the telephone companies switching office and the end user.

**3.21 loop current feed open (LCFO):** A Bellcore defined, switch-generated, fixed open (no voltage) on the line within the range of 150 ms to 350 ms as sent by the switch. Its purpose is to signal certain DLC devices to assign a time slot (transmission path) for a 15 s interval. NOTE—See [B3]<sup>2</sup>.

**3.22 meter interface unit (MIU):** See telemetry interface unit (TIU).

**3.23 multi-line hunt group (MLHG):** A group of lines that have a fixed alternate routing should one or more of the lines in the group be busy.

**3.24 network interface (demarcation point):** The point of connection between the local loop and the end user's (customer's) wiring.

**3.25 no-test trunk (NTT):** A specialized switch facility used for operator and service personnel metallic testing of lines. *Syn.*: test trunk facility.

**3.26 on-hook/off-hook:** Signaling conditions on a line in the form of dc impedance presented to the local loop by the TIU. On-hook implies that the TIU is in a high-resistance state and is not allowing significant current to flow. Off-hook implies that the TIU is in a low-resistance state and is allowing significant current to flow. When used in relation to the utility telemetry trunk, these signaling conditions indicate "idle" or "seized." NOTE—See ANSI T1.401-1993 and [B6] for more detail.

**3.27 outbound telemetry:** communications initiated by a utility or ESP towards a TIU.

**3.28 post disconnect timing:** A timing interval (normally about 12 s in length), initiated when the called party goes on-hook, in which the established connection remains as long as the calling party continues to remain off-hook.

**3.29 public switched telephone network (PSTN):** commonly called the switched telephone network.

**3.30 technical advisory (TA):** a telephone company publication intended to disclose information and request comments regarding network services.

**3.31 telemetry interface unit (TIU):** a CPE device that provides a network gateway function and an interface to one or more meters (water, gas, and electric) or other telemetry/control devices or to a local area network. The TIU may be placed in series with, or bridged onto, the local loop assigned to the end user. Because the TIUs are not network elements, but CPE, they are connected to the end user's line (tip/ring) of

<sup>2</sup>The numbers in brackets correspond to those bibliographical items listed in annex A.