



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Q.1301

(10/95)

INTELLIGENT NETWORK

**TELECOMMUNICATION APPLICATIONS
FOR SWITCHES AND COMPUTERS (TASC) –
TASC ARCHITECTURE**

ITU-T Recommendation Q.1301

(Previously “CCITT Recommendation”)

FOREWORD

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The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation Q.1301 was prepared by ITU-T Study Group 11 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 17th of October 1995.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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SUMMARY

This Recommendation identifies the Architecture that supports TASC (Telecommunication Applications for Switches and Computers) and is one in the Q.1300-Series Recommendations on TASC. The main purpose of TASC is to allow applications running within the network user's environment to integrate telecommunication services with computing facilities. This would typically allow business applications to use TASC to integrate the computer workstation and telephone at the user's desktop. This Recommendation does not define how the elements of the architecture are implemented. Part of the definition of the TASC architecture includes the TASC objects which are the basis for the TASC Functional Services.

INTRODUCTION

The concept of TASC, which this architecture supports, is described in Recommendation Q.1300, TASC Overview. Although the TASC architecture identifies, describes and models interactions between the TASC objects, it does not specify how they should be implemented. In addition to call and telecommunication device objects, the role of Agents (as in ACD system) is modelled.

BACKGROUND

This Recommendation is based on the experience of ECMA (Standardising Information and Communication Systems) and ANSI (American National Standards Institute) member companies in developing switch-to-computer interfaces and takes directions from CSTA (Computer Supported Telecommunications Application) and SCAI (Switch-to-Computer Application Interface) standards.

KEYWORDS

Architecture, Models, Objects, TASC.

Recommendation Q.1301**TELECOMMUNICATION APPLICATIONS FOR SWITCHES
AND COMPUTERS (TASC) – TASC ARCHITECTURE***(Geneva, 1995)***1 Introduction**

This Recommendation defines the architecture for TASC and identifies the various objects which represent information which the TASC interface operates on. The concept behind TASC is described in Recommendation Q.1300, which is considered essential reading prior to this Recommendation, and the services that the architecture supports are defined in Recommendation Q.1302. Recommendation Q.1303 defines the requirements for managing the objects herein described.

2 Scope

This Recommendation defines an architecture for the support of Telecommunication Applications of Switches and Computers. The architecture supports the communication between the switch and computer and the services conveyed by that communication. This Recommendation considers how the information communicated is represented. TASC does not define how the aspects making up TASC in either the switch or computer environment are implemented.

The emphasis of TASC has been to define third-party call control functions which also encompasses first-party call control. TASC is independent of any underlying mechanism and is applicable to public, private and hybrid networks. TASC is designed to be flexible in order to support other communication environments in addition to those based upon ISDN and Intelligent Network (IN) principles.

It is focused on providing an application service interface between a switch and computer.

TASC supports both a single-ended call (originating and terminating) view as well as a global call view.

The TASC architecture accommodates different ways of viewing calls available in implementations but models these views on stable and accepted models of how calls work.

3 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision: all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

- ITU-T Recommendation Q.1300 (1995), *Telecommunication Applications for Switches and Computers (TASC) – General overview.*
- ITU-T Recommendation Q.1302 (1995), *Telecommunication Applications for Switches and Computers (TASC) – TASC Functional services.*
- ITU-T Recommendation Q.1303 (1995), *Telecommunication Applications for Switches and Computers (TASC) – TASC management: Architecture, methodology and requirements.*

4 Terms and Definitions

This Recommendation uses terms defined in Recommendation Q.1300.

4.1 Abbreviations

For the purposes of this Recommendation, the following abbreviations are used:

ACD	Automatic Call Distributor
CE	Communication Entity
CP	Communication Party
CV	Call View
FS	Functional Service
OCV	Originating Call View
TASC	Telecommunication Applications for Switches and Computers
TCV	Terminating Call View

5 Architecture

The TASC Architecture provides a framework for communication between a computer and a switch. Recommendation Q.1300 describes the environments in which TASC may be used.

5.1 Domains

Domains identify the area that TASC may manipulate and influence.

5.1.1 Domain

Call domains ultimately deal with controllable and visible telecommunication devices in TASC's problem space. Such devices are referred to as Communication Entities (CE) so as to avoid confusion with connotations of specific types of devices.

5.1.1.1 Control and visibility

TASC deals with the control and visibility of calls as they originate and terminate at CEs. All TASC functions revolve around this fundamental principle. Therefore, the problem space involves calls which can originate, terminate, or become visible at CEs. The CEs defined by TASC include Line CEs and Distribution CEs.

When dealing with a call the switch is transparent to the application. TASC does not attempt to directly control or provide visibility of switches and computers. So switch and computer objects are not in the TASC problem space. Only the CEs related to or attached to switches and computers involved in the calls are visible.

5.1.1.2 Objects of interest

TASC consists of a set of functional services that provide peer-to-peer applications with a standard means of communication for the control and visibility of calls. Ultimately it is the peer-to-peer applications which know the objects of interest. Peer-to-peer applications not only have a communication application context, but they also have a common, and agreed, set of CEs in the object space. In other words, the two applications know the CEs over which they have control and visibility. This object space is either statically or dynamically defined. The locations of the objects are transparent to TASC. This is depicted in Figure 1 below.

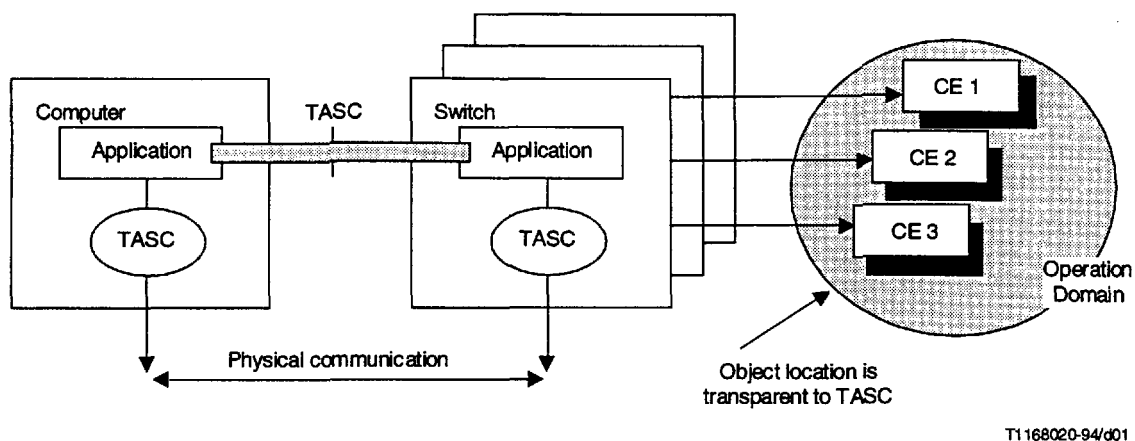


FIGURE 1/Q.1301
Transparent Location of CEs

5.1.1.3 Operation and working domains

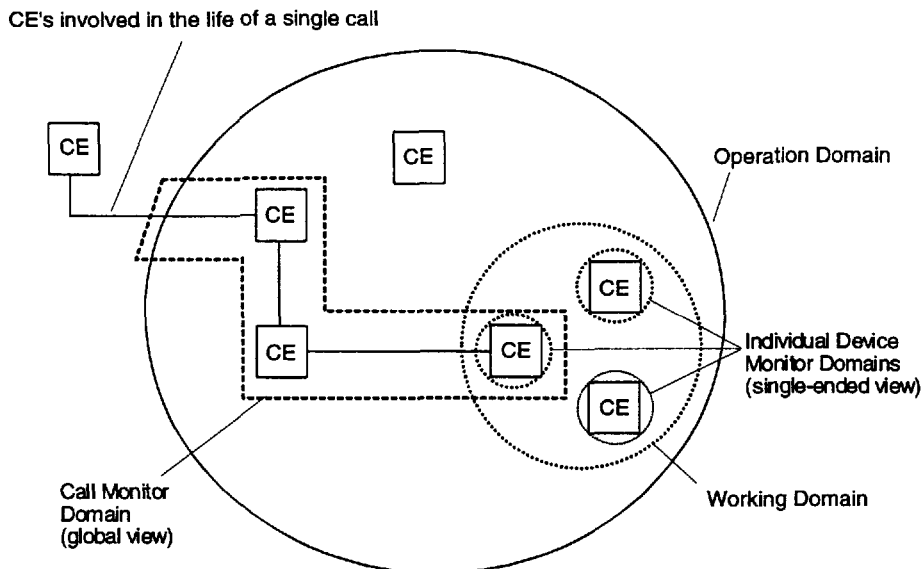
The identification of CEs of interest to an application may occur through static (subscription arrangements) and dynamic means (messaging). The identified CEs are the operation domain for a particular application. Once that application has begun processing, the transitional objects such as CVs (calls views), CPs (connections between CEs and calls), and Users may be created and destroyed as a result of TASC related activity. The working domain may expand or contract during the lifetime of the application but may not expand to include CEs outside of the defined operation domain. It is the set of CEs (objects) which can be monitored by an application which form a Working Domain. The relationship between Operation and Working Domain is illustrated in Figure 2.

TASC does not provide the ability for applications to acquire and lock the use of a CE for the exclusive use of a particular application process. Therefore coordination of applications and their use of CEs is outside the scope of TASC.

For example, in a customer service department for a company which has agents and an ACD system, the object space for the application is the set of objects representing the agent CEs and ACD pilot numbers where calls are originated, terminated, or become visible. This Operation Domain does not include end users (i.e. the customers' phones), external phones where service calls are originated, or the switches or computers. The objects which can be monitored are the agent CEs and pilot numbers, and these represent the domain of objects of interest in the calls. This object space is defined for, and known by, the peer-to-peer applications. The locations of the objects are transparent to TASC. The objects actually monitored form the Working Domain.

5.1.2 Call views

TASC defines a call view object to represent a call in the problem space. A call view has a call view identifier, a call view state, and participants or parties. The call view identifier is unique within the Operation domain. That is, in the communication between the peer applications, the Call View ID identifies a unique call. No two calls visible to the peer applications may have the same Call view ID.



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FIGURE 2/Q.1301
Operation and working domain

5.1.2.1 Single-ended view

The single-ended view of a call is the view of call progress and call states from a CE's perspective. The TASC object model for a two-party call splits into originating and terminating views. For example, for a basic call, when that CE is originating a call, the switch provides the single-ended view incorporating the originating call model events. The actions of the terminating side are implied in those events. When that CE is terminating a call, the switch provides the single-ended view incorporating the terminating call model events. The actions of the originating side are implied in those events but cannot be guaranteed. Information available about that CE and other CEs in the call is made available in the single-ended view by the switch.

Single-ended views are independent of each other. A switch may allocate separate call view identifiers for each single-ended view.

5.1.2.2 Monitoring within a single-ended view

TASC defines a single-ended view for the associated CE. This means that TASC defines call events which are reported for calls based on whether the call is originating, terminating or distributing at the CE. Thus if a CE is being monitored and a call terminates at the CE, the terminating call events may be reported. If a CE is being monitored and a call originates at the CE, the originating call events may be reported. Events may also be reported for monitored CEs at which calls appear such as Distribution CEs.

5.1.2.3 Global view

An alternative to the single-ended view is the global view where the view of call progress and call states are from the domain's perspective of a call. Thus all parties associated with a specific call can be visible with a global call view. Each party associated with the call still needs to adhere to the relevant basic call model (originating/terminating or distribution) but are united by a common identifier for the call.

The extent of a global call is limited by the operation domain, thus a call that goes outside of the Operation Domain may only be able to support a single-ended view in some circumstances.

5.1.2.4 Monitoring within a global view

The method used to invoke device and call monitoring differs but the event reports generated remain the same. With device monitoring, events are generated as a result of a change in the Call View state currently at the monitored device. With call monitoring, events are generated as a result of Call View state changes anywhere within the call. Two forms of Call Monitoring are defined within TASC:

- 1) A Call Monitor set on a call will generate events as a result of Call View state changes anywhere within the call. A call where some CEs are outside the TASC operation domain may report less call progress information; at least one CE must reside within the Operation Domain for call monitoring to function. This type of monitor will follow a single call. It may only be invoked once the call has been created and a Call View ID returned to the application, e.g. after a TASC Make Call Functional Service request or Call-Arrived event (see Recommendation Q.1302).
- 2) A Call Monitor set on a CE will generate events as a result of a Call View state change for every call that has involved the specified CE since the call monitor was invoked. A call where some CEs are outside the TASC operation domain may report less call progress information; at least one CE must reside within the Operation Domain for call monitoring to function. This type of monitor will follow all calls which have contact with the specified CE, e.g. a call monitor on a distribution CE will monitor all calls which are distributed by that CE. Events will be generated during the complete life of each call distributed.

Call monitoring is considered further in clause 6.

5.1.2.5 Calls between CEs

As calls originate, arrive, terminate and disappear from CEs within the working domain, events are reported based on the single-ended view, features in effect, and characteristics of a CE. Since all calls are uniquely identified by a Call View ID, any and all events which specify the same Call View ID in the communication protocol between the peer applications refer to the same call. The switches assign and manage Call IDs although a management function may manipulate these ID's as described in Recommendation Q.1303

5.1.2.6 Call view ID

Call IDs are assigned and managed by the switch and must uniquely identify calls at CEs. These Call IDs must be unique within the Working Domain between peer applications. How the switch assigns Call IDs to calls between CEs in the operation domain (i.e. whether or not it uses the same Call view ID for both originating and terminating objects and events) must be understood and known by the applications prior to association. Thus Call view ID assignment is part of the application rules and in part a function of the type of network – public, private or hybrid. It should be noted that a request for a global call view may be rejected based upon the capabilities of the signalling environment in which the applications exists.

5.1.2.7 Global call view ID

In a call between two CEs in a working domain, a Global Call is characterized by the same Call View ID being assigned for both originating, terminating and distributing endpoints. The Call view ID is unique in the Working Domain.

Management of identifiers is achieved via parameters included in Functional Service responses and Event Reports. Identifiers cease to be valid when their context vanishes. If a call ends, its Call View Identifier is no longer valid to refer to that call.

If a call changes its Call View Identifier when a Conference or Transfer occurs, identifiers are provided to link the old Call View Identifier to the new Call View Identifier. Similarly, if a CE Identifier is changed identifiers are provided to link new and old identifiers. Event Reports are used to report state changes.