

I n t e r n a t i o n a l T e l e c o m m u n i c a t i o n U n i o n

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Y.2901

(12/2006)

SERIES Y: GLOBAL INFORMATION
INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS
AND NEXT-GENERATION NETWORKS

Next Generation Networks

The carrier grade open environment reference model

ITU-T Recommendation Y.2901

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ITU-T Recommendation Y.2901

The carrier grade open environment reference model

Summary

ITU-T Recommendation Y.2901 presents the carrier grade open environment reference model.

Source

ITU-T Recommendation Y.2901 was approved on 14 December 2006 by ITU-T Study Group 13 (2005-2008) under the ITU-T Recommendation A.8 procedure.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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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ITU-T Recommendation Y.2901

The carrier grade open environment reference model

1 Scope

This Recommendation presents the carrier grade open environment (CGOE) reference model that is used to categorize CGOE components. These CGOE components are intended for use in commercial off the shelf (COTS) components.

2 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; 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. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T Y.2012] ITU-T Recommendation Y.2012 (2006), *Functional requirements and architecture of the NGN release 1*.

3 Definitions

This Recommendation defines the following terms:

3.1 application: An application is a piece of software answering a set of user's requirements using telecommunication network services via an IT system.

3.2 application programming interface (API): A boundary across which a software application uses facilities of programming languages to invoke software services.

NOTE – These facilities may include procedures or operations, shared data objects and resolution of identifiers.

3.3 building block: A logical unit, composed of components, characterized by its ability to deliver certain self-contained service functionality.

3.4 carrier grade: Colloquially, a "carrier grade" implementation of a solution, building block, or a COTS component exhibits particular qualities beyond regular information technology (IT) reliability, availability, serviceability, and manageability (RASM) features, enabling its mission-critical use in a service provider's offering.

NOTE – COTS component can be called "carrier grade" with respect to a particular building block if it meets all of the necessary and sufficient non-functional requirements of a COTS category for such a building block.

3.5 CGOE category: A unit of description of the CGOE reference model. It comprises one or more CGOE components.

NOTE – This method of abstraction keeps the size of the framework manageable and understandable. It avoids being too specific or leaning towards the needs of a certain building block. For example, the alarm management category consists of several components, e.g., alarm generation and alarm clearance.

3.6 CGOE component: A CGOE component is an abstract description of technical tasks, interfaces and properties.

3.7 CGOE reference model: A model that organizes the CGOE categories.

NOTE 1 – Each category is intended to be independent in the sense that it does not require the existence of the categories above it; however, to produce carrier grade functionality, functions may be needed from more than one category.

NOTE 2 – Multiple categories are logically grouped and referred to as the server hardware and the operating platform.

3.8 COTS component: A hardware or a software component instantiation of one or more CGOE components.

NOTE 1 – Existing or new components may instantiate CGOE components.

NOTE 2 – The following are examples of components: database system, operating system and management middleware.

3.9 component instance: A component instance is a specific representation of a component, which satisfies the needs of building a specific building block.

NOTE – Technology providers develop component instances. During the engineering process within the solution providers, instances are chosen according to the requirements, and are integrated to eventually stage the entire building block. Examples of component instances: Linux, management middleware for Q3-access.

3.10 control plane: The control plane performs the call/session control and connection control functions.

3.11 diameter: An IETF protocol that may be used to provide an authentication, authorization and accounting (AAA) framework for applications.

3.12 framework: A framework is an environment that provides a partial solution, usually automating a particularly tedious or difficult part of an application project.

3.13 functional requirements: The set of interfaces, capabilities and features developed with respect to a service architecture associated with a building block.

3.14 lifecycle management: The management of a component, including loading it into memory, allocating the system resources it needs and removing it when it is complete.

NOTE – The lifecycle management of a component also comprises the software management functions, i.e., first installation of the component, the management of upgrades and updates of new releases/versions of the component.

3.15 management plane: The management plane performs management functions for the transport plane, the control plane and the system as a whole. It may also provide coordination between all the planes.

3.16 middleware: The mediating entity between two information elements. Such an element can be, for example, an application, an infrastructure component or another mediating entity.

3.17 non-functional requirements: A list of features that a building block must provide in order to ensure certain behaviour within the service architecture.

NOTE – This list mostly represents requirements to allow for smooth operations and lifecycle management.

3.18 open component: A component can be called "open" when it is capable of being accepted, rejected, extended and replaced in a building block with minimal restriction and regulation, following commonly-accepted, publicly-available criteria and open standards for the interfaces.

3.19 open standards: Standards made available to the general public which are developed (or approved) and maintained via a collaborative and consensus-driven process. Other elements of "open standards" include, but are not limited to:

- Collaborative process – voluntary and market-driven development (or approval) following a transparent consensus-driven process that is reasonably open to all interested parties.
- Reasonably balanced – ensures that the process is not dominated by any one interest group.

- Due process – includes consideration of, and response to, comments by interested parties.
- Intellectual property rights (IPRs) – IPRs essential to implement the standard to be licensed to all applicants on a worldwide, non-discriminatory basis, either 1) for free and on other reasonable terms and conditions, or 2) on reasonable terms and conditions (which may include monetary compensation). Negotiations are left to the parties concerned and are performed outside the SDO.
- Quality and level of detail – sufficient to permit the development of a variety of competing implementations of interoperable products or services. Standardized interfaces are not hidden and are not controlled other than by the SDO promulgating the standard.
- Publicly available – easily available for implementation and use at a reasonable price. Publication of the text of a standard by others is permitted only with the prior approval of the SDO.
- On-going support – maintained and supported over a long period of time.

NOTE – "Open standards" facilitate interoperability and data exchange among different products or services and are intended for widespread adoption.

3.20 operating platform: An operating platform is an amalgam of many different infrastructure technologies that host application systems.

NOTE – The following are examples of key components of an operating platform: operating system, programming language, human interface representation, database server, security infrastructure and management infrastructure.

3.21 service plane: The service plane comprises:

- a) service presentation functionality being presented to the end user;
- b) service implementation aspects with which the end user interacts.

3.22 service provider: A company that offers end-to-end telecommunication services (fixed/mobile, voice/data) to customers.

3.23 solution provider: A company that engineers and produces building blocks and solutions and sells them to service providers.

3.24 technical task: The functional work performed by a component.

3.25 technology provider: A company that develops component instances, which solution providers integrate into building blocks.

3.26 transport plane: The transport plane provides bidirectional or unidirectional transfer of user information from one location to another. It can also provide transfer of control and network management information.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

API	Application Programming Interface
BGP	Border Gateway Protocol
CGOE	Carrier Grade Open Environment
CIM	Common Information Model
COPS	Common Open Policy Service
CORBA	Common Object Request Broker Architecture
COTS	Commercial Off-The-Shelf