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SERIES Q: SWITCHING AND SIGNALLING

Intelligent Network

Service plane for Intelligent Network Capability Set 2

ITU-T Recommendation Q.1222

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION Q.1222

SERVICE PLANE FOR INTELLIGENT NETWORK CAPABILITY SET 2

Summary

This Recommendation provides the architecture of the IN CS-2 service plane. The service plane is the "top" plane in the IN conceptual model which is defined in Recommendation Q.1201 "Principles of Intelligent Network architecture". This Recommendation provides the first view of the "top-down" approach where the services and service features are defined first and then the network capabilities to support/provide these capabilities are developed and realized on the lower planes (global functional plane, distributed functional plane and physical plane, respectively) of the IN conceptual model. This Recommendation further discusses the subjects of feature interactions, cooperations and interferences which were not addressed in the first issue of IN, i.e. IN CS-1. This Recommendation represents the user's view of services supported by an IN.

Source

ITU-T Recommendation Q.1222 was prepared by ITU-T Study Group 11 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 12th of September 1997.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The 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 Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 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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As of the date of approval of this Recommendation, the ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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Recommendation Q.1222

SERVICE PLANE FOR INTELLIGENT NETWORK CAPABILITY SET 2

(Geneva, 1997)

1 General

Recommendation I.312/Q.1201 "Principles of Intelligent Network architecture" presents the Intelligent Network Conceptual Model (INCM), as based on a four-plane structure.

The objective of this Recommendation is to provide the architecture of the IN CS-2 service plane. This architecture provides a reference to identify IN functionalities and their interactions. These functionalities and interactions are then described in subsequent IN CS-2 Recommendations.

IN CS-1 did not address the service plane because IN CS-1 was developed based on the existing network evolution into the IN concepts. IN CS-2 provides the first view of the "top-down" approach where the services and service features are defined first and then the network capabilities to support/provide these capabilities are developed and realized on the lower planes of IN conceptual model. IN CS-2 also addresses the subjects of feature interactions, cooperations and interferences which were not included in IN CS-1. Recommendation Q.1221 provides a complete listing of the services and service features for IN CS-2.

2 Service plane architecture

2.1 General

The service plane illustrates that IN-supported services can be described to the end user or subscriber by means of a set of generic blocks called "service features". To aid in the discussion of the service plane, the following definitions apply:

1) A service is a stand-alone commercial offering, characterized by one or more core service features and can be optionally enhanced by other service features.

2) A service feature is a specific aspect of a service that can also be used in conjunction with other services/service features as part of a commercial offering. It is either a core part of a service or an optional part offered as an enhancement to a service.

3) Interactions may occur between service features within a single service, or between the service features in different services. There is no visible distinction to the user of interactions that occur between services or service features. Therefore from the user’s perspective, the terminology "service interaction" or "feature interaction" is interchangeable.

4) Feature interaction is a situation that occurs when an action of one feature affects an action or capability of another. This situation is sometimes referred to as a service interaction. This situation may be undesirable or desirable. A desirable feature interaction is referred to as a feature cooperation. An undesirable feature interaction is referred to as a feature interference.

5) Feature cooperation is a desirable feature interaction where two or more features or instances of a feature operate together to achieve a desired result.

6) Feature interference is an undesirable feature interaction where a service fails to perform as expected and where the failure is due to the presence of other services, service features or of multiple instances of a single service.

The service plane represents an exclusively service-oriented view. This view contains no information whatsoever regarding the implementation of the services in the network (for instance, an IN type of implementation is invisible). All that is perceived is the network's service-related behaviour as seen, for example, by a service user.

For IN CS-2, telecommunications services, management services and service creation services are contained in the service plane; they can be described to the end user by means of telecommunications service features, management service features and service creation service features.

The services and service features included in IN CS-2 are a superset of those included in IN CS-1, i.e. they include additional services and features, while still supporting those identified in IN CS-1. (See Recommendation Q.1221 for a discussion of these services and service features.)

The definitions of these three types of service features are as follows:

– *Telecommunications service features*

  Specific aspects of telecommunications services that can be used individually or in conjunction with other telecommunication services/service features as part of a commercial offering. These may be either core or optional parts offered as enhancements to the telecommunication service.

– *Management service features*

  IN CS-2 introduces this category of service features. This includes the management features that support the activity performed by network operators and service providers. This includes such activities as monitoring, maintenance, traffic management, audit administration and billing.

  These service features include:

  - service customization features;
  - service control features;
  - service monitoring features.

– *Service creation service features*

  IN CS-2 introduces this category of service features. These features include the activities required for the network operator and/or service provider to specify, develop, deploy and verify new services to end users.

  These service features include:

  - service specification features;
  - service development features;
  - service verification features;
  - service deployment features;
  - service creation management features.

There may be relationships between services in one category and features in different categories. An example of this case is service creation output including service logic for the management aspects of a service. This requires a partitioning of functionality between service management and service creation, when developing network capabilities for the lower planes of the IN conceptual model.

Figure 1 illustrates these three types of service features on the service plane.

2.2 Characterization of services and service capability requirement

Characterization of services and service features is to identify service independent capabilities that are required to construct and/or customize services by the users or network operators.

A structured approach, as described in Recommendation Q.1202, is applied to classify service characteristics and identify service capabilities. This structured approach is a high-level approach for analyzing services and identifying SIBs to support these services. These reusable service independent building blocks form the basis for global functional plane modelling and distributed functional plane modelling.

It is recommended that activities involving functional modelling make use of the results of such service analysis, based on the characterization of services for verification of their models, and to ensure a unified model for service processing.

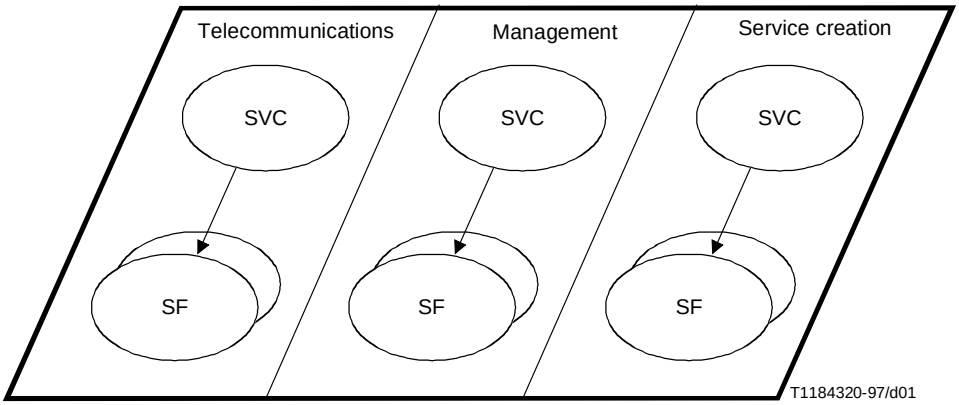

Figure 1/Q.1222 – In service plane

2.2.1 Service and service feature requirements

IN CS-2 introduces service management service requirements and service creation service requirements to provide service management service and service creation service capabilities. The services reflect what information is required by service creation and service management. Service management service enables the management of telecommunication services. Service creation service enables a fast and consistent way of introducing telecommunication services, including customer/user-specific services.

2.3 Service and service feature interaction

The IN service plane is ideal for the identification of expected interactions between services supported by the IN and for the definition of potential interaction solutions between these services. Also, with the development of the Unified Functional Model (UFM), which is not limited to IN, it is possible to define, and examine, interactions with non-IN-supported services. As services are mapped to service features, a reverse mapping will indicate which service features may be used by multiple services. This is one method to identify interactions that must be examined. The identification of these interactions in the service plane allows the definition of a set of potential interaction solutions that minimize negative interactions or maximize positive or desired interactions, based on the combination of services assigned to a given subscriber or affecting a different call.

2.3.1 Types of features considered for interactions

Feature interactions may occur between IN-supported features as well as between IN-supported and non-IN switch-based features. Within each category of feature interaction IN CS-2 provides mechanisms for the handling of the following types of (feature) interactions.

2.3.1.1 Interactions between IN-supported features

IN CS-2 provides mechanisms for the handling of the following types of (feature) interactions between IN-supported features:

– call-related IN-supported features to call-related IN-supported features;

– call-related IN-supported features to call-unrelated IN-supported features;

– call-unrelated IN-supported features and call-related IN-supported features; and

– call-unrelated IN-supported features to call-unrelated IN-supported features.

2.3.1.2 Interactions between IN-supported features and non-IN switch-based features

IN CS-2 provides mechanisms for the handling of the following types of (feature) interactions between IN-supported features and non-IN switch-based features:

– call-related IN-supported features to call-related non-IN switch-based features;

– call-related IN-supported features to call-unrelated non-IN switch-based features;

– call-unrelated IN-supported features to call-related non-IN switch-based features; and

– call-unrelated IN-features to call-unrelated non-IN switch-based features.

2.3.2 Mechanisms for handling feature interactions

The mechanisms for handling feature interactions in IN CS-2 support both intra-network and internetworking cases.

IN CS-2 identifies two general types of mechanisms to handle Feature Interactions (FI): "static" and "dynamic". Static mechanisms are applicable during the time period extending from the initial design of a feature up to the point of feature execution (e.g. during a call). This time period includes feature design, feature provisioning and subscription. Dynamic mechanisms are applicable during the time period when the feature is executing. This time period includes actual call-related and call-unrelated interactions.

Static FI mechanisms: These mechanisms involve the identification of potential feature interactions during the design phase of a feature, during the provisioning of the feature and/or upon subscription of a feature. These mechanisms require the service provider to incorporate safeguards and specific rules such that foreseen types of interactions between features can either be prevented from occurring or else be handled while the feature is executed.

Dynamic FI mechanisms: These mechanisms involve FI decisions being made during "run time" (e.g. during an actual call-related or during call-unrelated service features, such as, authentication, registration, etc.) and include two subtypes: anticipated and unanticipated.

The anticipated subtype involves run time solutions for those interactions that were foreseen by the service designer/provider. These mechanisms allow for specific decisions to be made during "run time" (e.g. during an actual call-related or during call-unrelated service features, such as, authentication, registration, etc.), based on a set of general guidelines and interactions between entities involved in delivering and/or using services.

The unanticipated subtype also involves run time solutions, since it is not possible for a service designer/provider to foresee all possible interactions between identified features. This problem becomes more acute with the introduction of new features, for which the original service designer/provider had no knowledge.

Static and dynamic mechanisms may cooperate, as illustrated in the description of the anticipated subtype of dynamic mechanisms. For example, a feature interaction solution might require actions to occur during a call (i.e. dynamic) which are dependent upon preparatory actions taken during feature provisioning (i.e. static).

Static and dynamic feature interaction mechanisms are applicable to the entire service plane. The initial focus for further feature interaction work should be on services which have been defined in sufficient detail (e.g. telecommunications services).

2.4 Service plane modelling

IN CS-2 utilizes the Unified Functional Methodology (UFM), of Recommendation Q.65 which allows for functional descriptions of services with information flows, SDL, and FEAs starting from a single unified functional architecture. The concept of SIBs has been adopted to address service creation needs as well as to introduce reusable blocks of flows, SDL, and FEAs which can be catalogued. This unified model enables all network architectures (i.e. ISDN, B-ISDN, IN, TMN) to be described in a similar manner.

In order to implement this UFM, the activities described above must be completed on the service plane, i.e. the decomposition of services into service features. The service features are then mapped to SIBs which are required for the development of the stage 2 service description and the subsequent stage 3 protocol description. The move from stage 1 to stage 2 is enhanced with the use of the IN service plane.

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