# Introducing Telco Service Manager

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# Preface

## In This Section

# Using this Manual

Welcome to Introducing Telco Service Manager (TSM).

This manual covers the different components that make up TSM Applications along with an introduction to their principal features.

## Before You Get Started

You should be familiar with the following:

- Your TSM architecture.
- Your TSM features.
- Programming Java and Java server pages.
- Designing or working with relational databases.
- Designing or working with extensible Markup Language (XML).

## Who Should Read this Manual

This manual is for anybody who wants to learn more about Telco Service Manager (TSM).

## How this Manual is Organized

This manual contains the following chapters:

- **Introducing the edocs Telco Solutions**

  This chapter introduces TSM and its architecture.

  It contains information about:

  - TSM
  - Important concepts
  - System architecture

- **What's New in this Version**

  This chapter covers the new and enhanced features of this version.

- **Main Functional Features**

  This chapter covers all of the functional features of TSM.

- **Main Technical Features**

  This chapter covers the technical features of TSM.

# What Typographical Changes and Symbols Mean

This manual uses the following conventions:

| TYPEFACE | MEANING | EXAMPLE |
|---|---|---|
| *Italics* | Manuals, topics or other important items | Refer to *Developing Connectors*. |
| Small Capitals | Software and Component names | Your application uses a database called the CID. |
| Fixed Width | File names, commands, paths, and on screen commands | Go to `//home/my file` |

# Finding the Information You Need

The product suite comes with comprehensive documentation set that covers all aspects of building Telco Service Manager (TSM) solutions. You should always read the release bulletin for late-breaking information.

### Getting Started

If you are new to the edocs Telco Solutions, you should start by reading *Introducing Telco Service Manager*. This manual contains an overview of the various components along with a list of the available features. It introduces various concepts and components you must be familiar with before moving on to more specific documentation. Once you have finished, you can read the manual that covers different aspects of working with the application. At the beginning of each manual, you will find an introductory chapter that covers concepts and tasks.

### Designing Your Solution

While reading *Introducing Telco Service Manager*, you should think about how the different components can address your TSM solution's needs.

You can refer to *Developing Telco Service Manager* for information about extending the object model, application security, and other design issues. The *CID Reference Guide* also gives you the information about how the information in your solution is managed and stored.

### Installing Your Telco Service Manager Application

You should start by reading the Release Bulletin. For detailed installation and configuring information, refer to *Installing Telco Service Manager*. This manual covers installing TSM on one or more computers. It also contains the information you need to configure the different components you install. You might also refer to *Developing Telco Service Manager* and *Developing Connectors for Telco Service Manager* as these manuals contain information on customizing applications and working with other software.

### Building Telco Service Manager Solutions

If you are designing and programming *Telco Service Manager*, you have several different sources of information. If you are programming the user interface of the solution, you should read *Developing User Interfaces for Telco Service Manager*. You also refer to the BLM Specification for detailed information about programming the user interface. For configuring the various components, you refer to *Installing Telco Service Manager* and sections in other documents that deal with the component to configure.

If you are working with the business logic of your solution, you should read *Developing Telco Service Manager*. You can also refer to the *BLM Reference Guide* for more information about the design and structure of the BLM object model. For information about how this information is stored, you should refer to the *CID Reference Guide* along with the CID Reference documentation for your database. In order to develop your application, you most likely will need to install and run the Loopback Connector. This component mimics back-end applications for development purposes. For information about installing and running this component, refer to *Using the Loopback Connector with Telco Service Manager*.

**Integrating Telco Service Manager Solutions**

If you are involved in configuring your solution to work with Operation Support Software (OSS), you should read *Developing Connectors with Telco Service Manager*. This manual helps you understand the integration architecture and shows you how to build connectors to connect to today's market-leading OSS software. You can also read *Using the Loopback Connector with Telco Service Manager* for information about a connector built for development purposes. Other manuals you can refer to for information about configuring your application include *Introducing Telco Service Manager* and *Developing Telco Service Manager*.

**Managing Telco Service Manager**

If you are responsible for managing TSM, you should read the *Installing Telco Service Manager* for information about configuring various components and information about working with different application servers. *Administrating Telco Service Manager* covers what you need to know about managing your solution at runtime. For information about OSS systems, you should read *Developing Connectors with Telco Service Manager*.

# If You Need Help

Technical support is available to customers who have valid maintenance and support contracts with edocs. Technical support engineers can help you install, configure, and maintain your edocs application.

To reach the U.S. Service Center, located in Natick, MA (Monday through Friday 8:00am to 8:00pm EST):

- Telephone: 508.652.8400
- Toll Free: 877.336.3362
- E-support: support.edocs.com (This requires a one-time online registration)
- E-mail: support@edocs.com

When you report a problem, please be prepared to provide us the following information:

- What is your name and role in your organization?
- What is your company's name?
- What is your phone number and best times to call you?
- What is your e-mail address?
- In which edocs product did a problem occur?
- What is your Operating System version?
- What were you doing when the problem occurred?
- How did the system respond to the error?
- If the system generated a screen message, please send us that screen message.
- If the system wrote information to a log file, please send us that log file.

If the system crashed or hung, please tell us.

# Contents

CHAPTER 1

# Introducing the edocs Telco Solutions

## In This Section

# Introducing Telco Service Manager (TSM)

edocs' customer self-service (CSS) solution, TSM, enables communications service providers to deliver a personalized, self-service customer portal, providing online account management, e-Commerce and electronic bill analysis.

TSM allows consumers, business customers and POS employees to activate and manage subscriptions, buy new products and services, review, investigate and pay bills, resolve problems, and analyze every aspect of the service relationship using virtually any commercially available communications device.

## The TSM Applications

The TSM applications in the edocs Telco Solutions are:

- TSM Channel Activator

  This application enables dealers and retail point-of-sale locations to acquire and activate new customer accounts online.

- TSM B2C

  This application delivers self-service for consumers, allowing them to purchase and upgrade contracts online, purchase and personalize the delivery of value added services, view and pay bills, top-up a prepaid account, manage personal information, including handset phone book data and manage all aspects of their accounts directly.

- TSM B2B

  This application delivers sales and activation reporting, customer support and general performance analysis for managers in the sales channel or channel managers within the service provider.

# Overview of TSM's Architecture

The TSM system architecture is based on the object model of a typical communications service provider. TSM provides quicker time-to-market and combines the benefits of a custom-built application with a generic solution. Based on market leading technologies and standards such as XML and Java, TSM not only provides the features you need, but also ensures an open and flexible architecture for your applications.

TSM runs as a Java application on any J2EE-compliant application server. Users can access the system through almost any commercially available electronic communications device – PC, voice (via a voice browser), interactive TV, WAP and GPRS handsets, PDA or any other handheld device. The application runs autonomously from the service providers' existing business and operational support systems, but is integrated with them to ensure that customer changes and other reference data are synchronized.

TSM offers features for the CSP or systems integrator. These features make it possible to customize various aspects of the application:

- JSP-based user interface, to incorporate a specific look-and-feel
- JSP/XML- based application workflow, to provide a unique user experience
- Java classes-based business logic, to extend the base functionality delivered with the application, and to enable integration of other systems directly into the application such as a specific security system, profiling system, churn detection system, and so on.
- Localization of the user interface, to enable users to view their accounts in their local language

TSM gives users a personalized experience that reflects their needs, such as:

- Individual look-and-feel, workflow, language, delivered features, etc.
- Multi-channel access - the application generates HTML or WML dynamically, based on both the user's profile and the device through which he or she accesses the system.

TSM provides a powerful security framework:

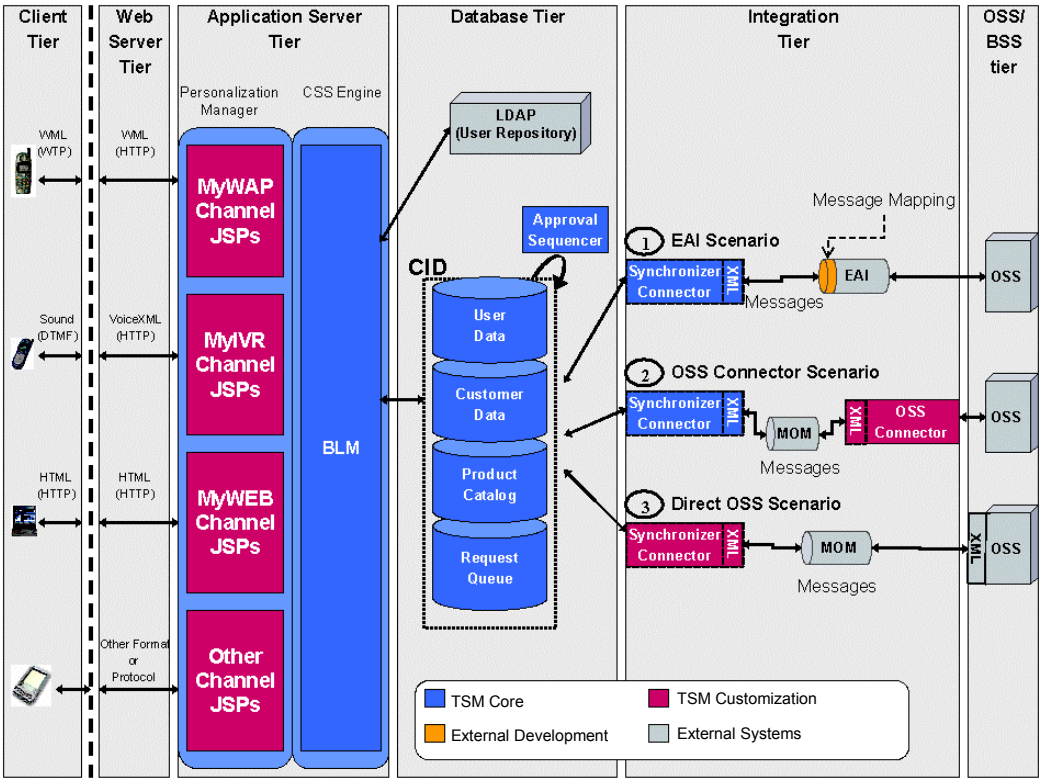
- Authentication of users
- Role management to control access to data and features

# Overview of the TSM Components

The TSM system architecture is comprised of the following components:

- Personalization Manager
- CSS Engine
- Customer Interaction Datastore (CID)
- SmartLink Framework

This diagram shows the different components of TSM.



# About the Personalization Manager

The Personalization Manager is part of the application presentation layer. This component gives communications service providers a framework to promote their corporate and product messages effectively, to ensure that they deliver a focused and personalized service to customers, regardless of the access device they use.

The Personalization Manager also simplifies and accelerates communications service providers and systems integrators' ability to customize their TSM Application. These features give the service provider the best of both worlds: customized functionality at the cost and implementation speed of a packaged product.

TSM uses Java Server Pages (JSPs) technology to display dynamic information to users and to receive requests and instructions from users. The Personalization Manager uses a JSP framework that allows customization of individual look-and-feel, workflow, language delivered, features available, and so on.

The Personalization Manager includes:

- Internet (WEB) application template with reference workflows
- Wireless Internet (WAP) application template with reference workflows
- Interactive Voice Response (IVR) application template with reference workflows
- The JavaServer Page Framework for TSM () application framework

The  uses JSPs to build an application framework that provides seamless integration of the application JSPs and the CSS Engine. The  provides a number of key features:

- Easy customization of workflow, language, available features, and so on.
- Session management, form-handling and exception handling
- Separation of application code and user presentation, enabling parallel out sourcing of the operational and image aspects of site design

By using the  as the foundation of your applications, you can separate the presentation logic from basic application tasks. The  also reduces development time because you do not have to rewrite all of these basic tasks for the Personalization Manager JSPs. All of TSM's Personalization Manager template applications use the .

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For more information about the:

- Application templates and reference workflows, refer to *About the Personalization Manager Channels* in *Developing User Interfaces.*

- The  and how to use it, refer to *Understanding the JSPF* in *Developing User Interfaces.*

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# About the CSS Engine

The CSS Engine holds the core application logic of your application, both transactional logic, allowing customers to view and to make changes to their contract and other relationship data; and analytical logic, allowing enterprise customers and other users to analyze contract, billing, usage and other relationship data from a number of different perspectives.

The object model for customer self-service comprises a comprehensive suite of Java (J2EE) packages, each addressing a specific aspect of service delivery for the customer. The CSS Engine includes multiple parallel models of the customer's business hierarchy (for enterprise customers); a flexible service catalog designed to meet the extended personalization needs of 3G wireless services; and a detailed representation of the customer's mobile contract or prepaid account, as well as trouble ticketing; electronic billing; and application personalization options for each user. The CSS Engine also provides a set of secure data analysis objects to retrieve and build cost, usage, transactional and other analysis reports; and a persistent service-centric shopping cart supporting the selection, configuration and purchase of complex mobile service contracts, together with advanced enterprise features such as order templates, bulk ordering, and dedicated corporate offers.

The CSS Engine includes:

- The customizable Business Logic Manager (BLM)
- Set of APIs to manage information in the CID
- The Data Access Layer (DAL) that manages the handling of data in the CID

The Data Access Layer (DAL) is responsible for passing data between the physical data repositories and process and the Business Logic Manager and (indirectly) the SmartLink Framework. Although data within the system can be regarded as being stored in a single location - the CID - the DAL allows a more flexible architecture.

The DAL is able to access any external data (for example: detailed billing) via standard SQL statements or by calling any specific Java API provided by the back end system. It manages the routing of data to and from the correct location, isolating the business logic from this complexity. If more servers are added, the complexity increases but the BLM is still protected by the DAL.

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For more information about:

- The structure and organization of the BLM, refer to the *BLM Reference Guide*.

- The BLM APIs, refer to the *BLM API Reference Documentation*.

- Security and using LDAP or other methods of authentication, refer to *Managing Security* in *Developing TSM*.

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- Configuring and customizing the behavior of the BLM, refer to *Developing TSM*.

- Working with the DAL and accessing external data sources, refer to Accessing External Data Sources in *Developing TSM*.

# About the Customer Interaction Datastore

The Customer Interaction Datastore (CID) is a highly normalized relational database model, designed to reflect the needs and structure of the modern communications service provider. The database schema is constructed around an online transactional processing (OLTP) business model focused on the sale, delivery, support and management of communications products and services to business and consumer markets.

The CID is the reference repository for all data specific to customer self-service, such as a user's preferences for the presentation and formatting of the self-service portal, and descriptive text and images for the service catalog. In addition, the CID creates a data cache, holding data copied from the multiple back-office systems and stored locally to the TSM system. This asynchronous caching approach decouples self-service performance from back-office systems, improving responsiveness as well as protecting the service provider's mission-critical BSS/OSS and particularly billing systems from high volume Internet traffic.

The CID also has a component used to allow the approval of changes to information. This component is called the approval sequencer which is responsible for obtaining the required permission before submitting the changes for processing.

The CID includes:

- The Customer Interaction Datastore
- Set of administration tools
- Sample reference and customer data sets
- Approval Sequencer

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For more information about:

The structure and organization of the CID, refer to the *CID Reference Guide* and the *CID Reference Documentation* corresponding to your database.

- Using the administration tools, refer to *Administrating TSM*.

- Sample data, refer to the *CID Reference Guide*.

- Working with the Approval Sequencer, refer to *Working with Approvals* in *Developing TSM*.

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# About the SmartLink Framework

The SmartLink Framework enables the TSM application to communicate, or integrate with the core service provider infrastructure, for instance billing platforms, Customer Relationship Management (CRM) software, and other business and operational support systems (BSS/OSS). This in turn allows the Customer Interaction Datastore to maintain a synchronized cache of semi-static customer and service data, as well as passing requests and responses between the various systems. This architecture guarantees protection for legacy systems from high volumes of Internet traffic while ensuring rapid response times for user interaction.

Because of the many different technological infrastructures deployed, the SmartLink Framework offers support for diverse environments. Example integration scenarios include:

- Enterprise Application Integration (EAI)
- Message Oriented Middleware
- Direct connection to legacy APIs

The SmartLink Framework includes:

- The Integration Logic Studio
- The Synchronizer Connector which manages the request queue in the CID
- The Connector template to be used as the foundation of an OSS Connector
- The Loopback Connector that receives standard messages from the SmartLink Framework and simulates the response from OSS systems.
- Set of administration tools

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For more information about:

- The Integration Logic Studio, refer to *Working With the Integration Logic Studio* in *Developing Connectors*.

- The Synchronizer and Connector template, refer to *Developing Connectors*.

- Using the loopback connector, refer to *Using the Loopback Connector*.

- Using the set of administration tools, refer to *Administrating TSM*.

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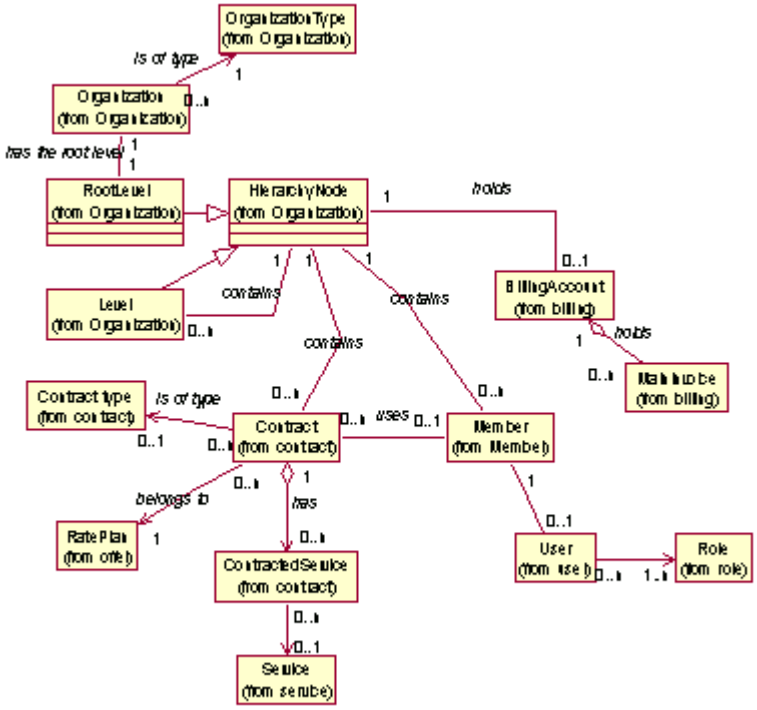
# Overview of Concepts

## Object Model




An organization is a corporate or residential entity managed by TSM. The organization type specifies the type of the organization. For example, organizations may be one of the following:

- Residential customer
- Business customer
- Telco operator
- Dealer

A corporate organization may have a hierarchical structure. For instance a business customer may have departments or a dealer may have retail outlets (refer to the `HierarchyNode`, `Level` and RootLevel objects)

# Member

A member designates a physical person. Members:

- May have one or more contracts
- May have an access to the TSM application (`user` object) to do the following:
- manage their contracts
- manage contracts of their organization (for business customers or families)
- manage contracts of other organizations (dealer employee managing contracts subscribed by customers).

Typical TSM users include:

- Residential customers
- Business administrators (manage contracts of their organization)
- Business employees (manage only their own contracts)
- Dealer employees (manage contracts of customers)
- Telco employees (managS contracts of customers)

The scope of contracts managed by TSM users are defined by their assigned roles. These roles define what administrative rights they have. This is the way TSM manages contract security as well as access to any TSM object.

Possible scopes include (scopes may be cumulated):

- Inter organization scopes:
  - All objects of organizations of given organization types

    An example of this scope is a telco employee.
  - All objects of the organizations which were declared as being managed by the level of the user

    An example of this scope is a dealer employee.
  - All objects of the organizations which were declared as being managed by one of the levels of the organization of the user.
  - All objects of the organizations which were declared as being managed by the user

    An example of this scope is an account manager.
- Intra organization scopes:
  - All objects of the organization of the user
  - All objects related to, or below the level of the user

    An example of this scope is a business administrator.
  - All objects related to the user

    An example of this scope is a business employee.

- All objects which were declared as being explicitly managed by the user

# Contract

The Contract object can be considered as the core TSM object. This object defines the customer's service contract with the telco operator. The ContractedService object defines the options chosen by the customer for the contract (for example, call waiting).

A contract is always associated with a rate plan. This rate plan defines the tariffs (options, usage, and so on).

The Contract Type specifies the nature of the contract. Contract types include:

- Mobile prepaid
- Mobile postpaid
- Fixed line

# Billing Account

A billing account defines:

- Payment information
- Which contracts are grouped together on the same invoice.

  The grouping of contracts is implicit through the customer hierarchy.

The billing account also holds invoices generated on a regular basis.

# Extending Objects

If an object does not have an attribute you need, you can extend the object. These new attributes are called *additional attributes*.

For the member object, you can add groups of additional attributes. Each group may be set independently of others. Groups of information for a member can be seen as additional objects associated to the member object.

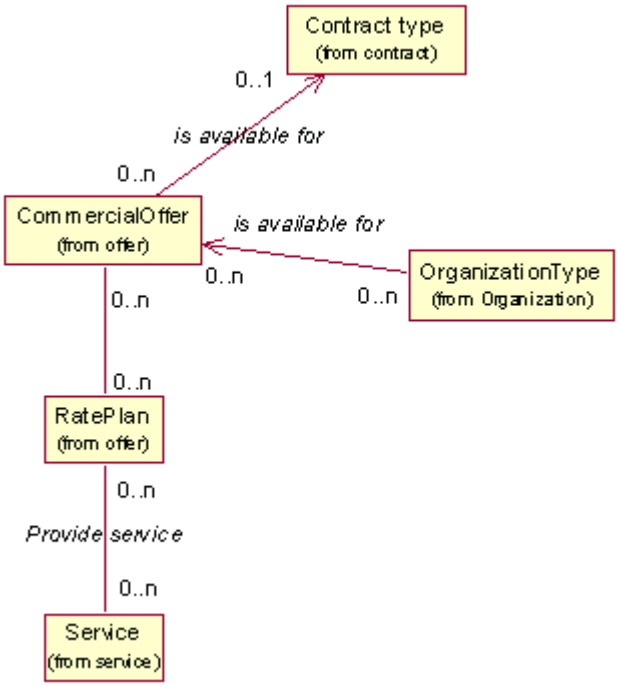
# Persisting Objects

Organization, RootLevel, Level, BillingAccount, MainInvoice, Contract, and ContractedService objects are persisted in the TSM CID database and synchonized with the telco operator's backend systems.

Each Member and User object instance (and all related data) may be either:

- Synchronized with the backend systems
- Persisted in TSM CID database

# Product Catalog



In order to propose rate plans and services to the users, TSM manages a product catalog.

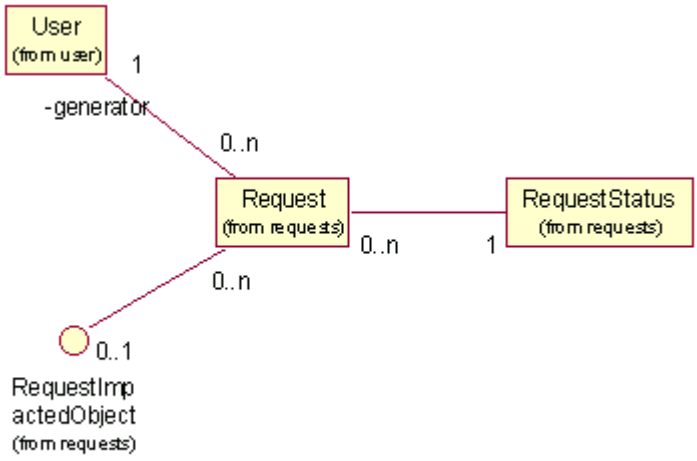
Each rate plan specifies the tariffs (subscription, usage, options) to be applied to the contract. A rate plan may include services. These included services may be manatory and the others being optional.

Rate plans are packaged in commercial offers.

A commercial offer is dedicated to one contract type, and is available depending on the organization type.

Commercial offers can be public, or restricted to specific customers. This is called a dedicated offer and allows TSM to manage special negociated tariffs for these customers.

# Request Queue




TSM centralizes all of the user request to be sent to the telco operator backend systems in the Request Queue.

Each request:

- Is generated by a TSM user
- Has a status. The status enables to follow the request's treatment. Possible statuses are:
  - To be approved

    The request has to be approved before being submitted to the back end systems.

- Not yet submitted

  The request is ready to be sent to the back end systems, and is waiting to be processed by the Synchronizer connector.

- Submitted

  The request has been successfully sent to the back end systems.

- Done

  The processing of the request by the back end systems was successful.

- Failed

  The back end systems have failed to process the request.

- Denied

  The request has been denied in the approval phase.

- Submission in progress

  The request is being processed by the Synchronizer connector, before being sent to the back end systems.

- Transport failed

  The Synchronizer connector failed to send the request to the back end systems.

- Acknowledged

  The back end systems have acknowledged the request.

- Impacts an object (for example, an add service requests impact the contract object)

CHAPTER 2

# What’s New in this Version

## In This Section

# What's New

Along with increasing the stability and performance, we have added some exciting new features that ease and accelerate your application development. Some of the new and enhanced features include:

- Organization Views
- Customer Analysis
- Centralized Environment Settings
- Bill Presentment
- Explicit Security

# New Features

The new features in this version include:

- Organization Views

  No matter how your OSS system manages organizations, you can create your own organization hierarchies that are independent of the OSS data structure.

  You can now create an organizational view that lets you build organizations that reflect how you do business, not on how an OSS manages data. For instance, your OSS may organize your organizations into cost centers. If you have to manage your contracts and users based on a specific location, this might not be very practical because different organizations in your office may be in different cost centers. You can now create an organization view that corresponds to organizations at the specific location.

- Customer Analysis

  Customer Analysis has a Communications Billing and Usage database (CBU). This database that contains billing and usage information for users. The CBU allows your users even more control over their accounts and services by allowing them to consult and analyze their usage and their invoice details.

  They can analyze their invoices using:

  - Reference dimensions such as date/time, tariff, and service
  - Customer-specific information such as organization views, contracts, and billing accounts

  The CBU is an open database. You can use any reporting tool you like to access information in the CBU for your users, even simple SQL queries. However, the CBU is designed with your user's needs in mind and is not built for internal analysis of your entire customer base.

- Query, Reporting, and Analysis Engine

  The Query, Reporting, and Analysis Engine (QRA) provides a secure, standard approach to retrieving analysis data from the CBU .

  Data Providers are the key components of the QRA. Data Providers separate reports from the physical data repository, guaranteeing secure access, and allowing new reports to be designed and used without the need to understand the technical definition of the CBU. For Report Processors within the Personalization Manager, Data Providers are effectively the source of analysis data.

  Any number of Data Providers can be defined through XML Report Definition schemas. Each Data Provider retrieves specific fields of analysis data from the Communications Billing and Usage data warehouse, constrained by any filters (Prompts) specified within the Data Provider definition, and also by the security restrictions of the user requesting the report. This ensures that regardless of the scope of a particular report, the user cannot gain access to information unless they have the security rights to view it. If the user's security rights are changed, they are updated through Notifications.

- Integration Logic Studio

  The ILS is a zero-code graphical tool, which allows developers to model and visualize the multiple Integration Processes within each Connector, without the need for Java programming. They can drag-and-drop different SmartLink Framework Processors into each process, edit Scripts and Macros, and generate complete Connectors ready for deployment.

  The ILS avoids the need to develop of message queue handling, message parsing and message trans-mapping processes for integration. It also requires no development and no Java programming to access either TSM or external APIs. Instead, the developer can concentrate on the best design of dataflow, and identifying the appropriate BSS/OSS APIs to read and/or write information between the inbound and outbound messages and the BSS/OSS applications.

- Centralized Environment Settings

  To ease deployment and configuration, environment settings related to third-party software such as database drivers are now handled in a common and shared location for all standalone components.

# Enhanced Features

The enhanced features of this version include:

- Bill Presentment

  We have enhanced bill presentment in this version of TSM. These enhancements allow you to easily integrate bill presentment in your application. Users can see their invoice and also view details such as service changes and tax details.

- Easier security configuration

  A new way to configure security on business objects is available. You can now easily identify security configuration topics as the business logic framework handles them from a separate location.

- Explicit Security

  TSM users can now manage other users without taking into account the organization as found in the OSS. Your application can now have users that manage other users. Not only does this mean that specified users can create other users, but they can manage their position in organization hierarchies and assign them contracts. You can also manage contracts directly without taking into account the OSS.

  For instance, your application can have a user manager. This user manager can:

  - Create users
  - Modify user details
  - Assign contracts to users

CHAPTER 3

# Main Functional Features

## In This Section

# About the Main Functional Features

This section summarizes some of the standard features of this version of TSM. This section is not an extensive list of all of TSM's features, but is an illustration of what you can do with TSM. These standard functions are included in the TSM Internet application template. You can use this template application as the basis for your own application.

Access to these features depends on the user's role and scope. This ensures that only authorized users can view information and make changes to objects.

The main features of TSM include:

- Organization management
- Hierarchy management
- Billing account management
- Order management
- Billing and Payment Presentment
- Contract Management
- Trouble ticketing
- Order documentation
- Member management
- Portal access management
- Object history
- E-Commerce
- User Activity tracking
- Request Management

# Organization Management

### Create an organization

Users can create an organization of a given type.

For example, a user can create a residential or business customer (customer acquisition), or a dealer.

Guest users can create themselves as a customer (self acquisition).

### Search for organizations

Users can search for an organization using pre-defined criteria. The returned organizations correspond to the ones matching the criteria and that the user has the right to view.

### Update organization legal contact

Users can update the legal contact of the organization (identity for a residential entity or company name for a corporate entity and address)

### Update organization information

Users can update the organization type, as well as the core (scoring value…) and additional attributes.

### Set dedicated offers of a customer organization

Users can add or remove a customer organization's dedicated offers.

A dedicated offer defines a negotiated tariff between the customer (typically a business customer) and the telco operator.

### Set the account managers of an organization

Users can add or remove an organization's account managers.

An organization’s account manager is the telco operator employee in charge of managing this organization (typically a large business customer).

# Hierarchy Management

### Browse hierarchy

Users can browse the hierarchy of an organization. They can browse the sub-levels starting from the root level, and, for each level, list the members, contracts or billing accounts attached to this level.

### Search for levels

Users can search for a level using pre-defined criteria. The returned levels correspond to the ones matching the criteria and that the user has the right to view

### Search for members

Users can search for a member using pre-defined criteria. The returned members correspond to the ones matching the criteria and that the user has the right to view

### Search for contracts

Users can search for a contract using pre-defined criteria. The returned contracts correspond to the ones matching the criteria and that the user has the right to view.

### Add a level

Users can add a level below a specified level.

### Update level information

Users can update the core and additional attributes of a level.

### Update level legal contact

Users can update the legal contact information (level name and address) of the level.

### Move a level

Users can move a level in a hierarchy by changing its parent level.

### Move a member

Users can move a member in the hierarchy by changing its level.

### Move a contract

Users can move a contract in the hierarchy by changing its level.

### Update the user of a contract

Users can update the user of a contract.

### Update list of contracts explicitly managed by a user

Users can update (add, remove, or set) the list of contracts which are explicitly managed by another user.

### Update list of members explicitly managed by a user

Users can update (add, remove, or set) the list of members which are explicitly managed by another user.

# Billing Account Management

### Add a billing account

Users can add a billing account to a level.

### Update billing account information

Users can update the core and additional attributes of the billing account.

### Update payment information

Users can update the payment information related to the billing account.

### Update billing contact

Users can update the billing contact (level name and address) of the level holding the billing account.

# Order Management

### Prepare an order using a shopping cart

Users can add and remove any request item (order product, add contract…) in shopping carts. A shopping cart is an order being prepared and not yet submitted.

However, a creating a new organization (create organization request) must be a unique request and cannot be combined with other items in the same order.

### Save a shopping cart

Users can save their shopping cart in order to submit it later.

### Submit a shopping cart

Users can submit their shopping cart. This generates an order.

An order may be subject to approval.

### Approve or deny an order

Specified users can approve or deny an order.

Depending on the approval policy, the order awaits approval until it is is approved or denied in its entirety. If approved, the order is sent to the telco operator's backend systems.

### Order tracking

Users can track the progress of their order by checking the status of the requests contained in the order (refer to *Request management - View requests status*)

# Billing and Payment Presentment

### Search for invoices

Users can search for an invoice using pre-defined criteria. The returned invoices correspond to the ones matching the criteria and that the user has the right to view.

### Browse invoice

Users can browse an invoice. They can

- View the invoice data (invoice number, invoice date, amount…)
- Browse the invoice line hierarchy starting from the invoice
- List the contract (invoice sections related to a contract), and for each sub-invoice:

  - View the sub-invoice data (amount…)

  - Browse the invoice line hierarchy starting from the sub-invoice

### View invoice sections related to a contract

Users can list the sub-invoices of a contract even if they are in different invoices.

### Search for contract invoice sections (contract sub-invoices)

Users can search for a sub-invoice using pre-defined criteria. The returned sub-invoices correspond to the ones matching the criteria and that the user has the right to view.

### Search payments

Users can search for an invoice using pre-defined criteria. The returned invoices correspond to the ones matching the criteria and that the user has the right to view.

The search criteria cannot be changed.

# Contract Management

**Create a contract**

Users can create a contract by specifying the following:

- Level owning the contract
- Contract type
- Rate plan
- Contract additional attributes
- Line number (optional)
- Optional services (any available service which is not a core service) along with their parameter values

**Add a service**

Users can add (sign up for) an optional service to a contract.

**Add a service to a group of contracts (bulk add service)**

Users can add (sign up for) an optional service to a group of contracts.

**Order a one shot service**

Users can order a one shot service for a contract.

**Order a one shot service for a group of contracts (bulk order one shot service)**

Users can order a one shot service for a group of contracts.

**Replace [contracted] services by new ones**

Users can replace some of the contracted optional services with new ones in the same transaction. This feature is typically used when there are incompatible services present.

**Update parameters of a [contracted] service**

Users can update the parameters of a contracted optional service (option).

**Update parameters of a service for a group of contracts (bulk modify service)**

Users can update the parameters of an optional service for a group of contracts.

**Remove a [contracted] service**

Users can remove (terminante) a contracted optional service (option).

**Remove a service from a group of contracts (bulk remove service)**

Users can remove an optional service from a group of contracts.

**Update the rate plan**

Users can update the rate plan of a contract.

**Update the rate plan of a group of contracts (bulk change rate plan)**

Users can update the rate plan of a group of contracts.

**Migrate the contract**

Users can migrate a contract (stored in CID or not) to another contract type (for example, migrate a prepaid contract to a postpaid contract). The user specifies the following:

- New contract type
- New rate plan
- New contract additional attributes
- Optional services (other than the core services) along with their parameter values
- The new contract's level if required
- The new user of the contact if required

**Declare loss or theft of a mobile device**

Users can declare the loss or theft of a mobile device such as a telephone.

This is only relevant in the mobile market. However the business logic does not control that the contract is in the proper market.

**Update technical information of the contract (phone number…)**

Users can update technical core (phone number…) and additional attributes of a contract.

**Contract technical attributes are those related to the Line object.**

During the contract creation process, additional technical attributes can only be set at the contract level, not at the line level.

**Update contract information**

Users can update contract core and additional attributes.

**Manage the contract life cycle**

Users can update the status of a contract, for example to activate, suspend, or deactivate the contract.

The statuses of a contract are configurable. By default, the status of a contract has no impact on the business logic.

### View the usage information of a contract

Users can view usage information (pre-billing information such as number of units used or left in a package, or total call duration since last invoice) of a contract.

### Recharge a prepaid contract

Users can recharge a prepaid contract by doing one of the following:

- Entering the number of a card already bought in a shop
- Buying a prepaid package online

# Trouble Ticketing

### Create a trouble ticket

Users can create a trouble ticket. The user specifies the following:

- Type of problem (optional)
- Details of the problem (optional)
- The related object (optional). Typically a contract, but it can also be an organization, a level, a member, or an invoice
- Contact information (optional): first name, last name, tel number, fax number, email address

### Update a trouble ticket

Users can update the following:

- Type of problem
- Problem details
- Related object
- Contact information
- Trouble ticket status

  The list of possible statuses is configurable.
- Assignement note
- All additional attributes

### Search for trouble tickets

Users can search for a trouble ticket using pre-defined criteria. The returned trouble tickets correspond to the ones matching the criteria and that the user has the right to view.

The search criteria cannot be changed.

# Documentation Ordering

Users can order a specificed number of copies of a document (optionnaly with a specified enclosure) for themselves, or for another member, level or organization.

# Member Management

**Create member**

Users can add a member to a level.

**Update legal contact**

Users can update the legal contact (identity and address) of a member.

**Update member information**

Users can update the member core and additional attributes.

# Portal Access Management

### Logging in

Users are authenticated by logging in into the TSM portal. They have to give their login and password.

Authentication may also be trusted. The user is authenticated by another authentication server. When accessing TSM portal, TSM trusts the authentication and automatically creates a session for the user.

### Logging out

Users can log out from the TSM portal.

The session also expires after a set number of minutes of inactivity. Users will then have to log in again.

### Create a login for a member

Users can create a login for members so they can access a TSM portal. The user enters login, an optional password, and a list of roles (administrative rights).

### Enable or disable a login

Users can enable or disable the login of a member. This activates or suspends the access to the TSM portal's access for this member.

### Update the administration rights of a user

Users can update the roles (administrative rights) assigned to a TSM portal user.

This is only possible if this member has access to the portal.

### Update the password

Users can update the portal password of a member.

This is only possible if this member has access to the portal.

### Update language

Users can update the language of a member.

As a result, when this member has a login giving him access to the portal, the TSM portal will be the specified language.

Since TSM supports Double Byte Character Set Languages, there is no limit to the languages which can be made available to portal users.

# View Object History

Users can view the history of an object (organization, level, billing account, member, contract)

# e-Commerce

### Order product

Users can one or more products (for example, a handset or an accessory).

TSM does not check the availability of products.

# User Activity tracking

### Generate user event

User events are generated, to track users' activity.

Each user event is logged in the CID database.

User events are divided into the following categories:

- System user events.

  These events are automatically logged. These user events include:

  - Session events (login, logout, session expiration)

  - Submission of requests

- Custom user events.

  You can log your own user events from the JSPs.

### Search user event

Users can search for a user event using pre-defined criteria. The returned user events correspond to the ones matching the criteria and that the user has the right to view.

# Request Management

A request defines any update requested by a user. It can be part of an order or not.

### View requests status

Users can search for a request using pre-defined criteria. The returned requests correspond to the ones matching the criteria and that the user has the right to view.

They can then check the status of returned requests.

CHAPTER 4

# Main Technical Features

## In This Section

# Security

TSM manages data security in 2 different ways:

**Ensuring a user manages the right information**

- Portal account: TSM portal users must be identified by a login/password

  Guest users (unidentified users) can also interact with the TSM portal, but only via limited workflows consisting of creating themselves as a new customer, or registering to the TSM portal (they cannot access data of other customers)
- Each TSM portal user is assigned some administrative rights (roles) and has no access to objects which are outside of the scopes as defined by the roles.
- Some specific workflows or JSPs can be automatically forbidden when the user does not have the proper role.

**Securing data between the client's browser and TSM portal**

By implementing secure http (https), it is possible to encrypt and therefore secure data being exchanged between the client's browser and TSM portal.

# Reloading Reference Data

At initialization, TSM loads all CID reference data in its internal cache. This is done for performance reasons.

The TSM solution administrator can update the TSM reference data by reloading the cache without stopping TSM portal and interrupting service.

# Logger

You can use the TSM logger to create your own logs while your solution is running.

The common logger features are available for the different product components and each component can have its own specific logger configuration and output. You can log events in the following:

- Presentation Layer - includes the Personalization Manager and CSS Engine
- Synchronizer - The Synchronizer connector, SmartLink Framework, CSS Engine
- Connectors - Loopback and Template Connectors

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