

amdocs

AMDOCS **PORTFOLIO**
RELEASE 7.5

Amdocs

Overview

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1 Introduction

Amdocs Portfolio is a set of products and applications providing seamless, multi-channel ordering. It offers a unified user-interface across billing, CRM, sales, ordering, and product catalog. It provides comprehensive, business best-practice, industry-specific processes.

Amdocs uses a modular approach supporting all service providers' revenue engines such as:

- Wireless (CDMA and GSM)
- Voice over Internet Protocol (VoIP)
- Public Switched Telephone network (PSTN)
- Leased Line
- Frame Relay
- Integrated Services Digital Network (ISDN)
- Digital Subscriber Lines (DSL)
- Internet Protocol–Virtual Private Network (IP-VPN)
- Internet Protocol Television (IPTV)
- Advanced Intelligent Network (AIN)
- Asynchronous Transfer Mode (ATM)

Amdocs Portfolio is designed to meet the needs of communications service providers offering the digital lifestyle. Applications can be assembled as needed, tailoring the Portfolio products to fit individual business needs.

Scope

This overview manual contains product, foundation management, and integration information summaries. Each section has detailed introductory information.

This document includes the following chapters:

Chapter 2 – “Amdocs Products”

An introduction to the Amdocs products: Amdocs CRM, Amdocs Ordering, Amdocs Self Service, and Amdocs Billing and Charging.

Chapter 3 – “Amdocs Foundations”

An introduction to Amdocs Foundations, a set of fundamental software components commonly used by Amdocs products.

Chapter 4 – “Product Integration”

An introduction to the integration of Amdocs portfolio software products, such as billing and ordering or self service and ordering sharing common data.



Note You can find more details about Amdocs platforms and technology on the Amdocs Product Website.

Target Audience

This document is for managers and developers planning the Amdocs Portfolio implementation and for whoever needs a high level understanding of Amdocs Portfolio and its functionality.

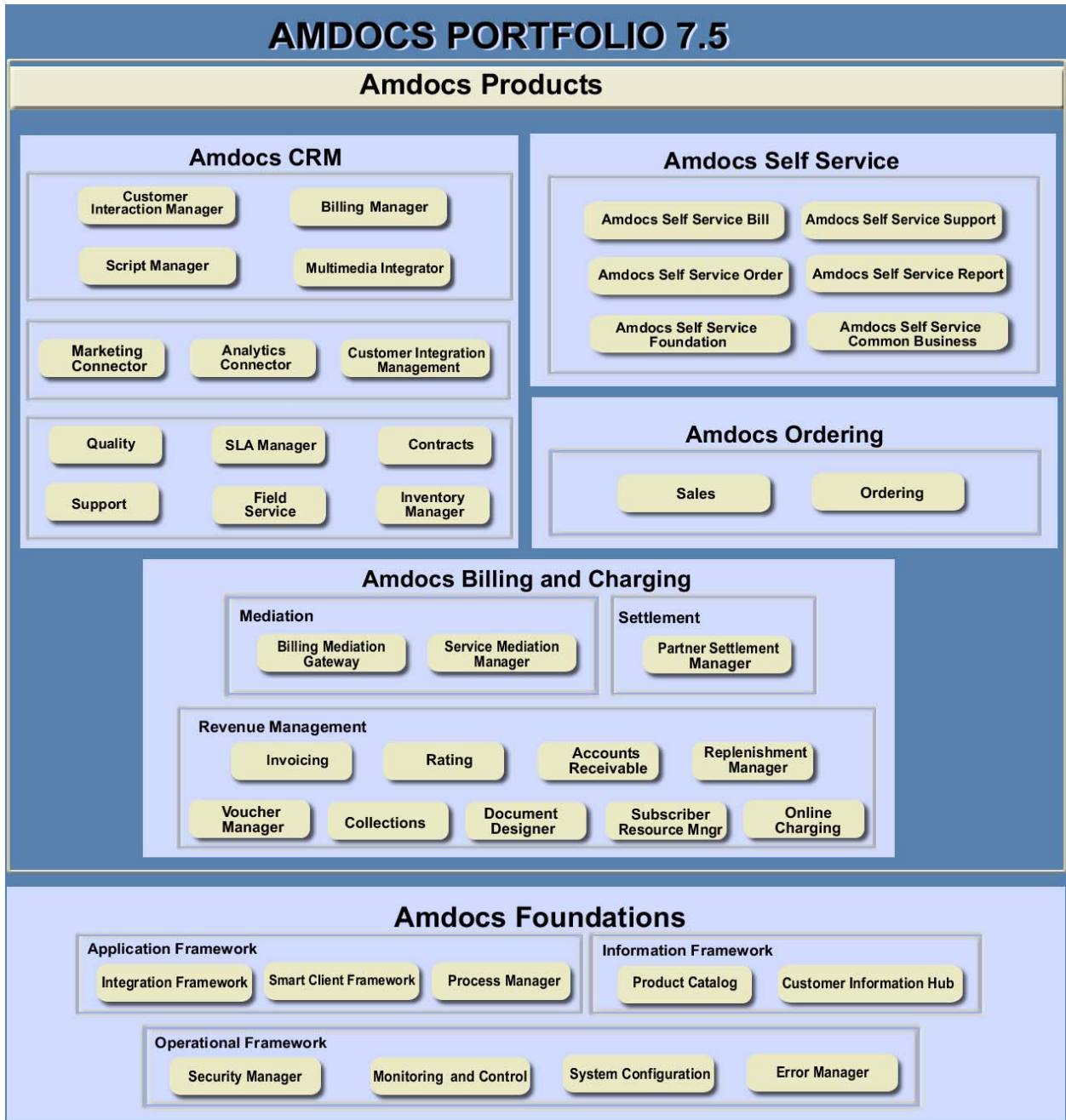
2 Amdocs Products

The Amdocs Products chapter is an overview of these products and their subcomponents:

- Amdocs CRM
- Amdocs Ordering
- Amdocs Self Service
- Amdocs Billing and Charging

See [Figure 2-1](#) for a graphical representation of the functional areas covered by Amdocs Portfolio products discussed in this book.

Figure 2-1: Amdocs Portfolio Products



Amdocs CRM

Amdocs CRM is a suite of products supporting customer management across multiple communication channels, with closed-loop processes on time and in real time.

Amdocs CRM gives service providers the tools to identify specific customers and to match them with appropriate products. It includes the following applications:

- Amdocs Customer Interaction Manager
- Amdocs Billing Manager
- Amdocs Script Manager
- Amdocs Multimedia Integrator
- Amdocs Analytics Connector
- Amdocs Marketing ConnectorAmdocs Customer Integration Management
- Amdocs Quality
- Amdocs Contracts
- Amdocs SLA Manager
- Amdocs CRM Inventory Manager
- Amdocs Field Service
- Amdocs Support

All Amdocs CRM products are Smart Client applications. Smart Client applications are delivered over your corporate intranet and automatically update without user-action while still providing the look and feel of native desktop applications.

Smart Client applications have one user interface across all agent applications, enabling faster, more consistent and personalized customer interactions.



Note Amdocs continues to support the Amdocs CRM Web Client applications, thin client, and server related applications.

If you are an existing Amdocs CRM customer, you can upgrade to Amdocs Smart Client. For more information about the upgrade process, see the *CRM Upgrade Guide*. For more information about the CRM Smart Client, refer to the “Amdocs Smart Client Framework” in chapter 3. of this book

Amdocs Customer Interaction Manager

Amdocs Customer Interaction Manager (CIM) is designed for usability and performance in a high-volume, 24x7 environment requiring fast response times.

The key capabilities are as follows:

- Unified agent desktop for all inbound and outbound interactions
- Context-driven user interface with actionable customer recommendations
- Context-driven user interface across multiple desktop and back-office applications
- Launch-pad for Amdocs, third party, or legacy business processes
- Single sign-on
- Designed for high volume, multi-functional contact centers

Amdocs CIM processes and user interface minimizes keystrokes, agent eye and cursor movement, and screen refreshes.

The desktop has the following features:

- Prominently displays key customer information, such as name, account, and customer lifetime value on a persistent customer dashboard.
- Displays the customer interaction history, installed assets, completed and pending orders, invoices and payments, trouble tickets, and relevant marketing offers.

When a customer calls about their bill, they can use an interactive voice response system. If the customer requests an agent, the responding agent has direct access to the customer's latest billing-related interactions

When a customer calls a phone number associated with a particular marketing campaign, the agent sees the relevant campaign details on the screen. A script guides the agent, helping the agent to respond efficiently to questions and convert it to an order.

For requests that cannot be handled in a single interaction, Amdocs CIM initiates the escalation and follow-up processes.

Amdocs Billing Manager

Amdocs Billing Manager is the billing customer care application that presents an integrated customer and billing view, with context-driven navigation for all front-office billing operations. To minimize the total cost of ownership and maximize operational efficiencies, it an out-of-the box process integration of Amdocs Billing products such as:

- Amdocs Charging
- Amdocs Accounts Receivables
- Amdocs Collections

It can integrate with third-party billing systems and in-house-developed billing applications.

The key features and business processes of Amdocs Billing Manager are:

- Organizational and billing hierarchies– Amdocs Billing Manager defines and maintains complex organizational hierarchies and billing relationships, such as:
 - organizational hierarchies defining relationships between customer accounts and organizational units
 - billing hierarchies defining the service provider entities from the billing perspective, including financial accounts, billing arrangements, prepaid buckets, customers, subscriptions, and organizational units
- Customer management– Amdocs Billing Manager performs customer account maintenance operations for billing and payment profiles, bill cycle, bill address, bill frequency, charge group distribution, event group distribution. It also performs hold, release, or redirect bill operations.
- Postpaid account management– Contact center agents can run billing and usage queries during and after the consumption of any service. Amdocs Billing Manager offers agents drill-down capabilities that allow them to examine balances, statements, bill images, invoices, billed and unbilled charges, event details, usage accumulations, and payments. Agents can make recurring and multi-level payments, as well as multi-level credits and adjustments.
- Prepaid account management– Agents can run balance queries, usage queries, and recharge an account.
- Collections management– Contact center agents can view accounts that are past due, collection history, and treatment path. They can also perform collection activities such as changing policy, pausing collection, instigate collection, change collector, communicate to the customer, and write-off debts.

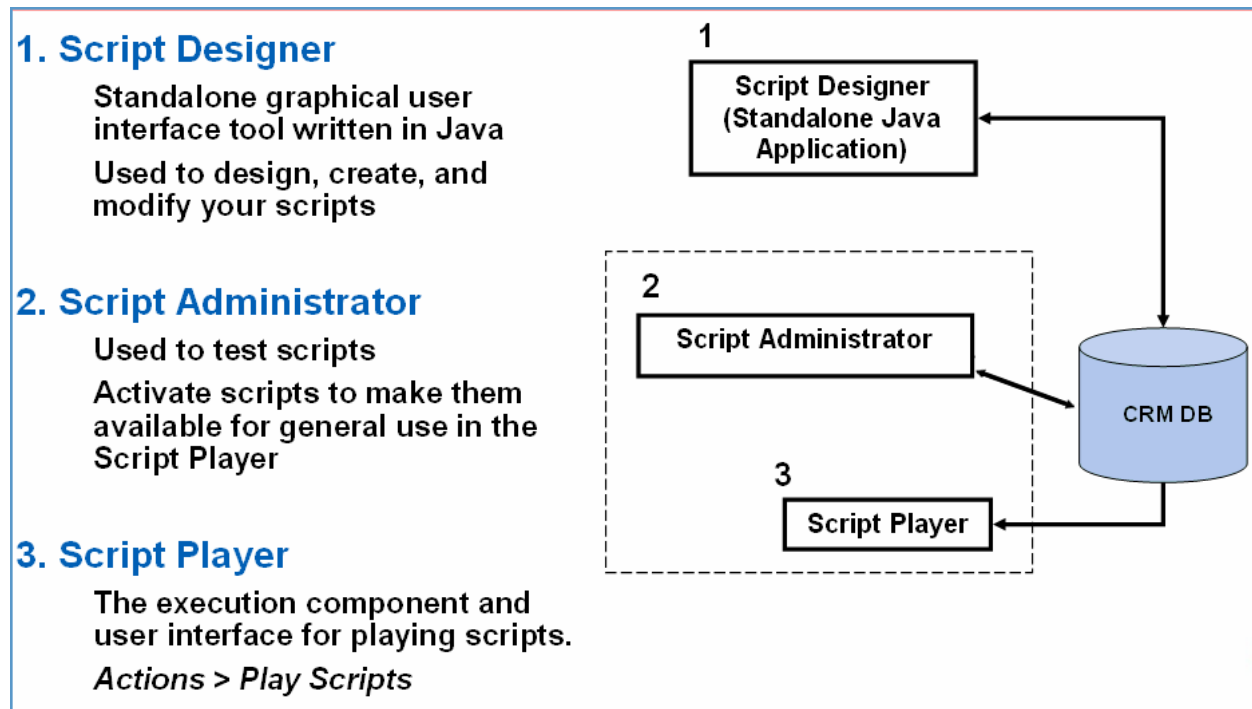
Amdocs Script Manager

Amdocs Script Manager is a script design and roll-out tool that is designed to optimize your customer interactions, simplify the resolution of complex customer requests and reduce agent learning curves. At the same time, it allows you to maintain consistent business processes and desirable corporate policies. Your agents can use scripts for retention efforts, up-selling and cross-selling, troubleshooting, carrying out customer surveys or for ramping up on new services. To personalize every interaction, the customer responses, profile, interaction topic and analytical information are dynamically taken into consideration. The following defines the three components of Script Manager:

- The Script Designer module is a robust set of functions to design scripts for different scenarios. A script is a series of prompts that guides agents through an interaction with a customer. Each prompt has a set of possible responses.
- The Script Administrator tests and activates the scripts developed in the designer module.
- The Script Player plays, aborts, or restarts scripts and logs the script history after the script is activated. Script Player stores the played script results so that you can review customers' responses to the scripts. You can use the script history to establish customer satisfaction with products, services, or processes, and to determine the effectiveness of a marketing campaign.

Figure 2-2 graphically shows the three components of Script Manager.

Figure 2-2: Amdocs Script Manager Components



Amdocs Multimedia Integrator

Amdocs Multimedia Integrator provides an open framework that enables you to use third-party media servers with Amdocs CRM applications. The media adapter for the particular media server acts to route the media event through the controller and on to the Amdocs CRM application.

Amdocs Multimedia Integrator features:

- Inbound and outbound contact management
- Open, standard media integration interfaces
- Multimedia workflow management integrated with Amdocs CRM
- Data exchange with media servers
- Ability to use the media of choice based on your preferences

With Amdocs Multimedia Integrator you can provide consistent, seamless customer service across all media. Amdocs Multimedia Integrator makes use of the Media Controller as a framework for configuring the multimedia workflow management.

The Media Controller includes media server and application integration APIs for creating your own media adapters or to extend the provider sample implementation. The Media Controller:

- Includes the state machines used to control the media controller components
- Is the interface between media servers and Amdocs CRM web and Smart client applications
- Receives events from media servers and notifies registered applications of relevant events

The State Machine Manager maintains user and connection states for every user assignment, propagates media events to registered applications, and maintains the mapping between applications and media connections.

The Media Adapter maps the external media server APIs to Amdocs CRM media server APIs. The Amdocs CRM Media Server and Application Integration APIs are used to create new adapters for external media servers or extend the sample implementation.

Amdocs Analytics Connector

Amdocs Analytics Connector provides a framework that reduces the IT effort involved in implementing integrated analytic solutions for Amdocs CRM and accelerates the implementation process. This module enables faster and easier extraction of data from Amdocs transaction systems into a reference data mart, which is then used by business intelligence tools to generate and deploy scores for use in Amdocs CRM.

Components delivered and supported with Amdocs Analytics Connector include:

- High level meta-data description for churn management
- Data mapping guide from Amdocs CRM and Amdocs Charging to reference data mart
- Dynamic analytics capabilities that helps your customer-facing employee in deciding the next action to take when interacting with the customer

Amdocs Marketing Connector

Amdocs Marketing Connector provides a framework for customer touch point when recommendations arrive in real time, from staged recommendations from of the customer's point of contact choice.

Amdocs Marketing Connector collects, stores, and utilizes customer recommendations all saved in a history file. Components delivered and supported with the Amdocs Marketing Connector include the following:

- APIs, to request and retrieve customer recommendations
- APIs, to write customer response and disposition back to the marketing engine database as well as to the Amdocs CRM tables
- Customer recommendation history, recording the customer's response to previously offered recommendations
- Updated Amdocs CIM user interface displaying recommendations and relevant information, including the customer's likelihood to accept the recommendations
- Staged: customer-specific and generic recommendations from a third-party marketing engine
- Dynamic marketing capabilities within Amdocs Customer Integration Management that enable the CSR to launch the appropriate process or script to capture and complete the recommendation

Example:

A communication service provider recommends a new phone plan. When the customer accepts, and the communication service provider indicates this acceptance in Amdocs CIM; the system begins the ordering process of ordering a new phone plan with pre-populated relevant information. The disposition of the recommendation is saved in the recommendation history for use in the creation of new recommendations for this customer.

Amdocs Customer Integration Management

Amdocs Quality

Amdocs Quality is a quality management system to help you manage the flow of information to ensure that defects and enhancement requests are handled efficiently and accurately. As a defect is identified, it is logged into the system as a Change Request. Your organization can track performance metrics as well as software and hardware defects.

You can perform the following actions with Change Requests:

- Maintain a complete audit trail of a Change Request from the time it is reported through to its conclusion
- Track tracking ownership and agreed upon deadlines. Amdocs Quality tracks the progress of a Change Request with updated status descriptions and its query capabilities
- Keep others informed of the defect or enhancement status by adding email addresses to a Change Request email list.
- Mark a Change Request as a duplicate if it references the same problem reported in another Change Request

- Replicate a Change Request, to quickly enter Change Requests for a similar issue. See *Amdocs Quality User: Tasks and Features*
- Create relationships between Change Requests such as, designating a Change Request as a parent or child of a group Change Requests into a hierarchy

Amdocs Contracts

Amdocs Contracts is a tracking system with which you can create, manage and view customer contracts. Service level agreements can be defined and documented, and use notification capabilities to keep your support personnel apprised of current contracts characteristics, installed parts, and past service histories. Information captured in Amdocs Contracts includes the following:

- Contract start dates
- Contract end dates
- Contracted products
- Contracted services

Amdocs Contracts also identifies the following associated support programs:

- Key milestones
- Priority
- Coverage hours
- Response time
- Entitlements
- Define and manage organization-to-organization operational agreements

Key Features and Components

A contract outlines the products and services to be provided to a customer for an agreed upon price. Contracts are made up of line items, which are grouped into schedules.

- A line item can define a product or a service, which is called a support program.
- A schedule is a group of line items that share similar characteristics, such as billing period information, cost-price schedule association, and bill-to address.

Example

Site A requires Product X with support 24 x 7. A schedule in a contract with the customer would include a schedule with the following two line items:

- Product X, installed at Site A
- Gold-level Support Program consisting of 24x7 coverage provided to Site A.

Support Programs

A support program is a service offered to a customer at a specific price. A grouped support program is a support program that includes other support programs. Each support program can include parts for which service is provided. Often, a part definition includes many parts, in a hierarchy known as a Bill of Materials. You can associate product-based

support programs with the top-level product or any of its component parts in a Bill of Materials by selecting the part number definitions you need for the association between the required parts and the support program.

Price Factors

Contracts can include adjustments to prices, such as discounts or surcharges. You can manually apply ad-hoc adjustments to a line item or schedule or you can define and use price factors. Price factors are predefined discounts or surcharges that you can apply to line items or contract schedules. Using price factors provides a method for creating customer-specific prices for services.

You can define price factors as a percentage multiplier, such as 5% or 10%, or as a fixed-rate amount, such as \$100 or \$50. You can apply price factors to either the base price or to the net price of a line item, schedule, or contract.

Price factors can be dependent on any of the following:

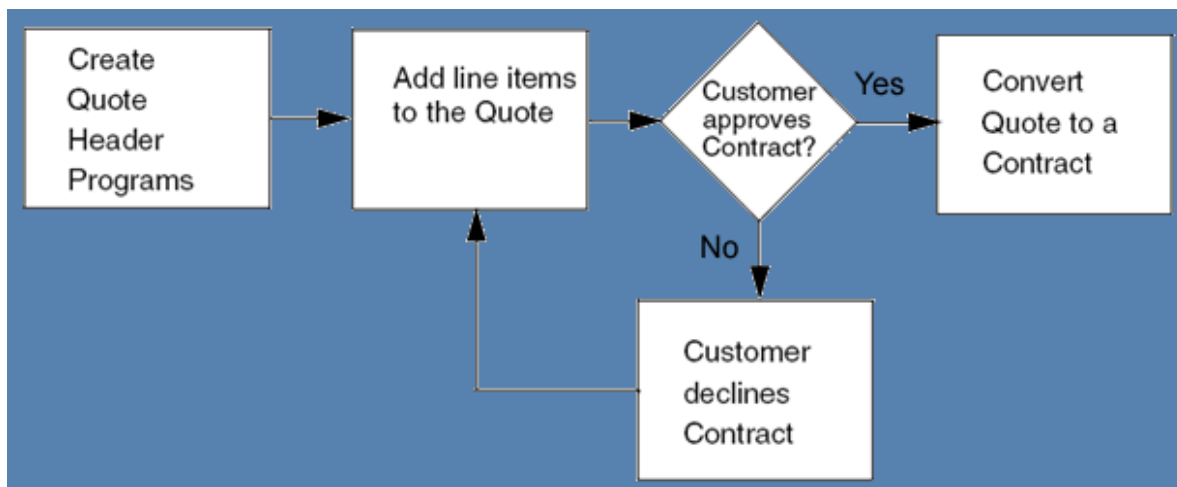
- A discount to promote a new support program or a new product
- A surcharge to cover extensive travel expenses or shipping costs
- Seasonal demand discounts or surcharges for recurring business cycles

Lifecycle of a Contract

The lifecycle of a contract begins with proposal offering service programs to a customer at a specified price. Each quote is composed of schedules that contain line items with different prices for different sites.

Figure 2-3 shows steps to create quotes and converting them to contracts.

Figure 2-3: Quote Approval Process



After a quote becomes a contract, you may find that the customer wants more coverage options. You can create a new quote and after the customer approves it, you can merge the new active contract into the customer's existing contract so that all of the customer's services and products are maintained and managed in a single place.

Amdocs SLA Manager

Amdocs SLA Manager manages service level agreements. Service level agreements are contracts made between a service provider and a customer that determine important details such as which services to provide and cost. Amdocs SLA Manager uses Amdocs CRM elements for key data used in the SLA algorithm.

The contracts specify important aspects of a service agreement:

- Eligibility – who is eligible for support? This can be an individual, a site, or an installed product. Amdocs SLA Manager displays the contracted eligibility status so the agent can offer the agreed-upon support services to a caller when the case is created.
- Entitlement – what services are offered under the agreement and which metrics define how the agreement is fulfilled? The metrics includes priority and standardized response times of the service response.

The milestones, priorities and response times are defined within support programs. Which support program is used is specified in the support contracts.

Amdocs SLA Manager helps agents manage time-to-repair and time-out-of-service by providing a monitoring capability of the case workflow. When an agent sets the milestones to mark progress through various workflow stages, Amdocs SLA Manager computes and records response times.

Amdocs CRM Inventory Manager

Amdocs CRM Inventory Manager provides an integrated system for tracking and managing inventory and its related assets. Using a customized model of the service provider's logistics and accounting system, users can track and administer the flow of parts and assets through internal and remote inventory locations, repair stations, in-transit locations, and customer sites.

Amdocs CRM Inventory Manager is divided into four logical modules:

- Field Operations – Links support and logistics. Field Operations personnel use the system to schedule, track, manage, and allocate the required resources for resolving customer cases.
- Order Operations – Includes features used for most warehouse, cost of goods, and off-site personnel inventory operations. Part requests, state transitions, and pricing are the main functions of Order Operations.
- Spares Management – Provides the top-level of inventory and part asset management. Spares Management users have complete control over part requests, as well as being able to locate, track, and redirect parts, administer and reassign inventory locations, bins, and stocking levels, and restrict part access and user privileges.
- Depot Repair – Tracks parts through the repair cycle, logs labor and material costs associated with those repairs, and applies Engineering Change Orders (ECO) to parts.

Amdocs Field Service

Amdocs Field Service is seamlessly integrated with Amdocs Support. Contact center agents can quickly select and dispatch the most appropriate field service technician, with

the required parts, providing accurate information about the customer, the product, the issue, and service information for service-related billing.

With the Schedule Tracker, field service personnel can proactively schedule appointments, such as planned maintenance, upgrades and site audits; in addition to entering sick and vacation time, training sessions and jury duty. Amdocs Field Service also enables organizations to understand the exact costs associated with each onsite visit. Using customer-defined business rules, organizations can designate expense categories, such as onsite, travel, mileage, lodging, airfare, administrative and parts.

By using Amdocs Field Services you have:

- Increased customer satisfaction by consistently meeting service commitments
- Protected revenue by ensuring services or parts are not unintentionally given away
- Increased field service efficiency by dispatching field service technicians with detailed service request information
- Eliminated unnecessary field visits by dispatching the field service technician with the right parts to complete the work required in a single visit
- Improved billing accuracy by capturing time and expenses for each service provided

Amdocs Support

Amdocs Support is an application for customer service and support needs. Customer support representatives can perform the following:

- Log and route cases
- Set priorities
- Verify contracts
- Review case histories
- Track and manage products installed at customer sites
- Combine multiple interaction channels into one

Amdocs Support is designed for a first and second-tier support role in a multi-tier support organization.

Amdocs Ordering

Amdocs Ordering is an end-to-end integrated ordering system that automates the entire ordering process. Related to Amdocs Ordering is Amdocs Sales, which is a comprehensive sales force automation solution. It keeps contacts, accounts, products, competitors, and sales process information.

Amdocs Ordering

Amdocs Ordering manages the customer-facing purchase experience, solving the customer-critical ordering problems that affect a service provider's ability to generate revenue from newly purchased or upgraded services. The Amdocs approach is to provide an ordering capability that, among other measures, reduces order errors, speeds order handling time and reduces training costs for contact center agents who are on the front

line of service purchases and upgrades is an end-to-end integrated ordering system that automates the entire ordering process, from negotiation to delivery and completion. It is an overall Communication Service Provider solution for all ordering activities across the range of wireline, wireless, cable, and convergent products and services (such as quadruple-play offers) in a single integrated environment.

Amdocs Ordering automates the introduction and order processing of supported products and services and offers the following to service providers:

- Manage the customer ordering experience
- Optimize automated order handling processes for minimal error and time efficiency
- Synchronize product offerings and ordering processes
- Bridge the gap between ordering and operational support systems, reducing order delays

Amdocs Sales

Amdocs Sales captures and manages sales information for small and large sales organizations. Multiple deployment options are available, ensuring that the performance and integrity requirements of global sales organizations are met.

Leads can come from many sources, including marketing campaigns, events, networking and customer requests. Once imported into Amdocs Sales, these leads can be associated with their primary source. Any resulting revenue can be traced back to the lead source, allowing the organization to measure and refine the effectiveness of its marketing activities. When a new lead is created, it enters the Amdocs Sales pipeline and is tracked until it is closed.

Amdocs Sales helps identify and match the most appropriate and effective sales person to a specific territory. It defines a wide range of roles and responsibilities, including field sales, telesales, telemarketing, presales, and sales managers.

You can perform sales analysis with Amdocs Sales across a number of dimensions, such as geography, products and lines of business.

Sales professionals can maintain contact, account, product, competitor, and sales-process information through the opportunity management user interface. Role-based security and personalization ensures that each member can efficiently fulfill their tasks. When sales opportunities satisfy the appropriate criteria, they can be submitted as forecasted items, removing the need to manually re-enter the details at a later stage.

You can use the web-client interface and centralized application logic, organizations to make changes in functionality and appearance either incrementally or to the entire organization. Organizations can tailor methodologies such as Strategic Selling, Target Account Selling, and Holden can enforce them to ensure sales needs are met.

Amdocs Self Service

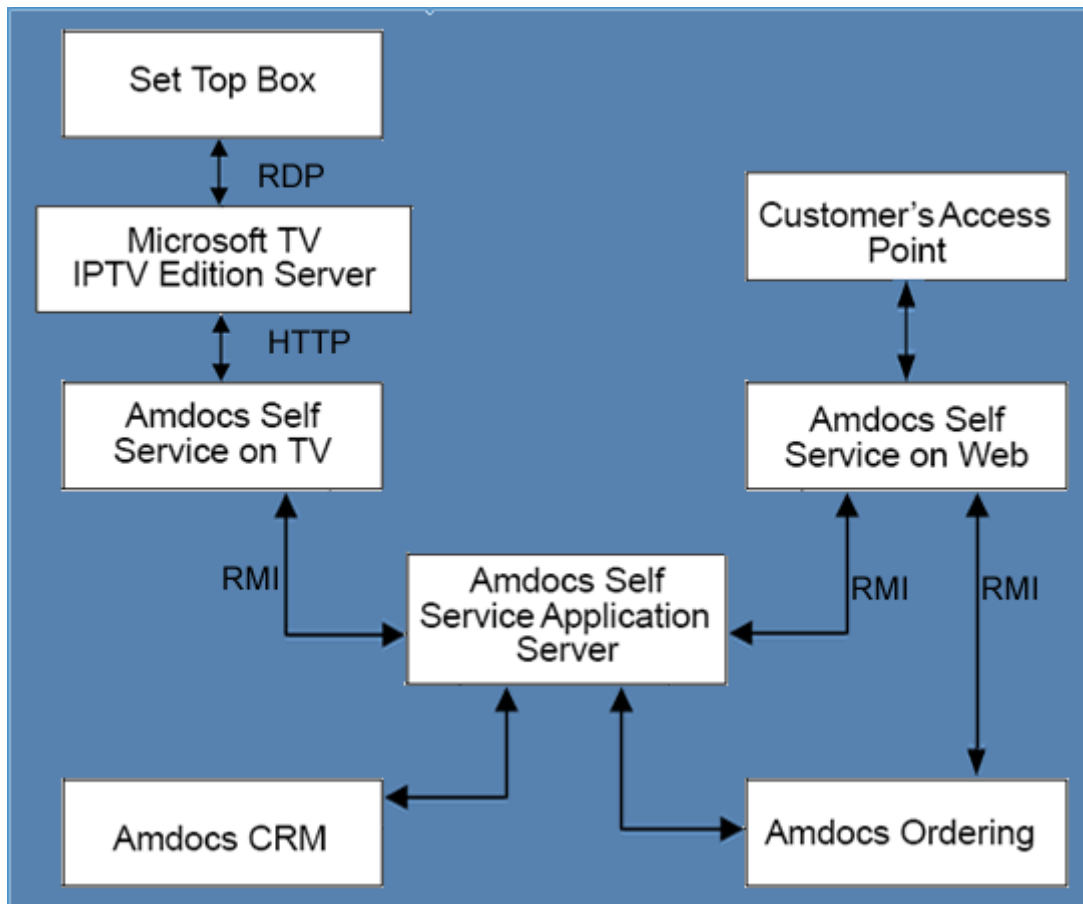
Amdocs Self Service is a product designed to give your customers visibility of and control over their own accounts at home, which decreases corporate work-load. With this product, your customers can:

- View all the products and services currently assigned to them
- View offers and products that are available for self-purchase
- View information on the IPTV product
- Change the products currently assigned to them, such as adding or removing a TV pack, or upgrading their basic TV package
- View order summary information and submit an order

Amdocs Self Service on TV and Amdocs Self Service on web servers use the Amdocs Self Service Application Server, which controls access to Amdocs Ordering and Amdocs CRM servers.

Figure 2-4 illustrates a typical deployment of the Amdocs Self Service servers for customers providing services through both Web and TV channels.

Figure 2-4: Amdocs Self Service Components



Amdocs Self Service Application Suite

The Amdocs Self Service Application Suite has features to support various Amdocs Self Service functions offered to residential and corporate customers such as ordering, customer support, online bill viewing, and reporting. These features are built using front end presentation and back end integration frameworks with common business functions. Amdocs Self Service comprises applications providing the following features:

- Amdocs Self Service Bill
- Amdocs Self Service Support
- Amdocs Self Service Order
- Amdocs Self Service Report
- Amdocs Self Service Foundation
- Amdocs Self Service Common Business

Amdocs Self Service Integration

Amdocs Self Service operates as:

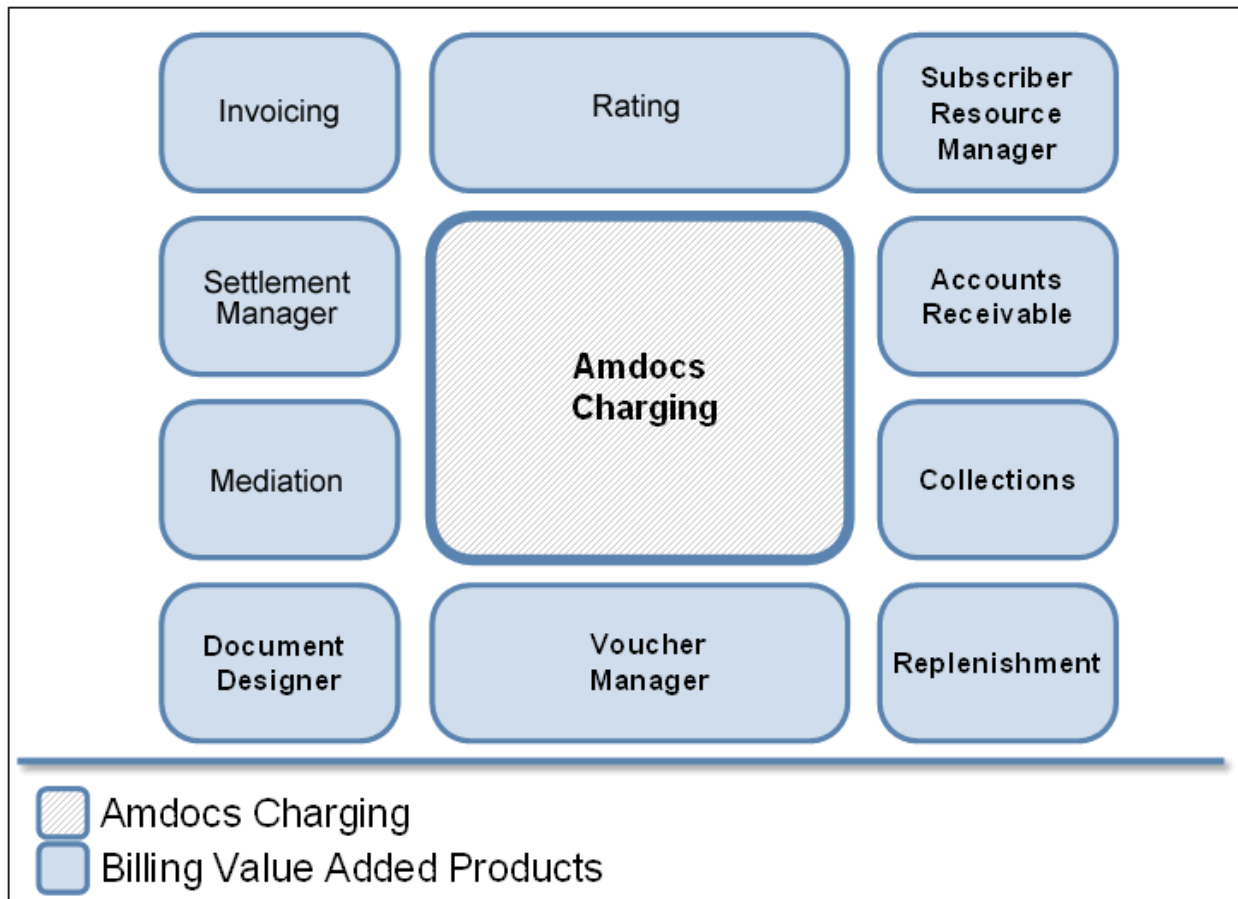
- A standalone implementation, connecting to the Amdocs Self Service database
- A complex implementation integrating numerous external systems and engines to support enriched features in each application module.

Amdocs Self-Service gives customers an integrated Web-based problem-handling GUI which allows them to open and track service requests and complaints while online. Customers can see and update their accounts, such as voice and data service.

Amdocs Billing and Charging

Amdocs Billing is a flexible, real-time rating and billing platform for all service types. Figure 2-5 shows Amdocs Charging at the core of Amdocs Billing applications.

Figure 2-5: Amdocs Charging at the core of Amdocs Billing



Using an integrated online-offline charging platform, Amdocs Charging can accept a payment before or after billing for wireless and wireline subscribers. With Amdocs Charging, service providers can enable their Integrated Customer Management strategy. It is a production-proven, carrier-grade product, preconfigured for rapid, low-risk deployment. The product is a modular extension with Amdocs products or with third party applications.

Amdocs Charging

Amdocs Charging is a central, network-independent charging and rating platform for all types of event sources and services, including voice, data, content, commerce, and video. Amdocs Charging supports multiple-access technologies and networks in both wireless and wireline environments. It uses an integrated online and offline charging platform that can operate in multiple processing modes, including request-response, transaction-based,

and file-based modes. Amdocs on-line charging platform interacts in real time with various session control elements for pre-delivery service authorization.

Amdocs On-Line Charging

Amdocs On-line Charging provides flexible, real-time rating for all voice, data, broadband, content, commerce and video services combined with real-time balance management. Utilizing an integrated online-offline charging platform, Amdocs Charging allows service providers to support prepaid-postpaid convergence with one product.

Amdocs On-line Charging is a production-proven, carrier-grade product, pre-configured for rapid, low-risk deployment. It is designed with open, standard architecture and is pre-integrated with other Amdocs and 3rd party applications. On-line charging is available in multiple processing modes including request-response, transaction and batch.

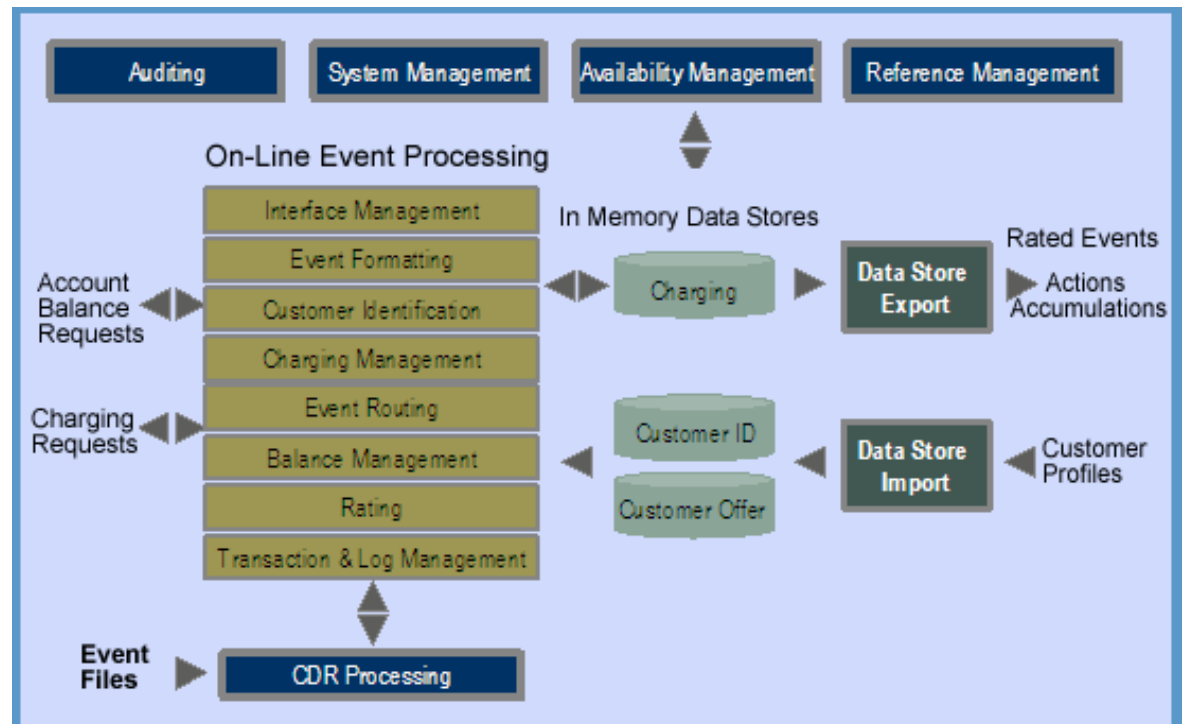
Amdocs On-line Charging uses a configurable, service-based transaction engine that enables run-time service logic changes. It provides a high performance, scalable architecture, which supports unlimited growth through multiple customer population groups on multiple servers.

The following lists the on-line charging main modules:

- Auditing
- System management
- Availability management
- Reference management
- On-line charging
- Balance management
- Call detail record (CDR) processing
- On-line event processing
- Data-store management

Figure 2-6 graphically shows the main modules in Amdocs On-line Charging.

Figure 2-6: On-line Charging Functional Blocks



Auditing

The Auditing module records the number of events processed by Amdocs Charging. It records file-based or real-time request-responses, providing collection, recording, balance checking and reporting capability.

System Management

The System Management module manages Amdocs On-line Charging applications and system resources; and supports integration with third-party system management platforms.

Amdocs Application Monitoring and Control manages the operation of the On-line Charging system. The managed resources are:

- Amdocs On-line Charging transaction engine and background daemon processes.
- Amdocs On-line Charging log files.
- Databases resources status.
- System daemons and resources.

Availability Management

The Availability Management module offers two modes that enable building a highly-available system according to customer needs:

- Basic High Availability mode provides resource monitoring and control scripts for failure detection.
- Application-level High Availability mode provides 99.999% up-time, fast event response time, revenue assurance through transaction tracing and scalability

The Data integrity is ensured by using the replication features of the database.

Reference Management

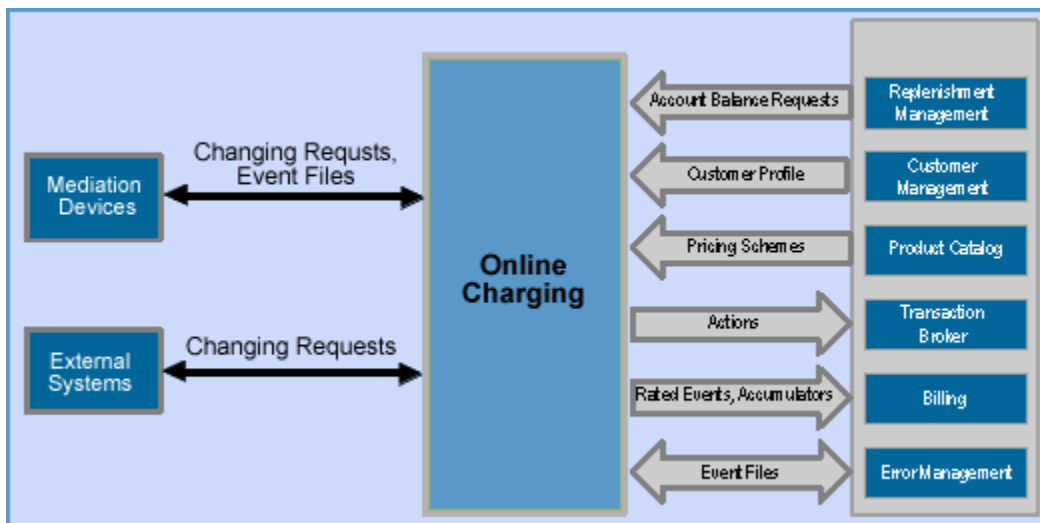
The Reference Management module manages reference data including:

- A GUI for editing reference tables – the GUI is based on the Amdocs Screen Composer GUI and provides access security and user-administration capabilities.
- Reference table data distribution – editing and distribution is done in background services.

On-line Charging Main Modules

On-line Charging interacts with a number of external systems and applications, as shown in the following diagram as shown in [Figure 2-7](#).

Figure 2-7: On-line Charging System Application Interaction



Amdocs Balance Manager

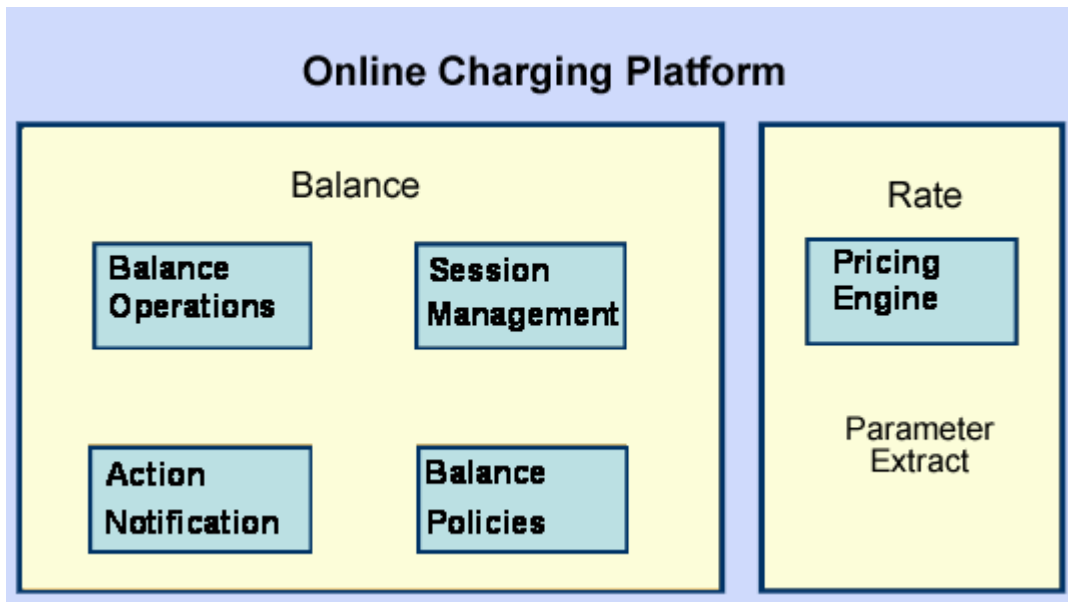
Amdocs Balance Manager manages the prepaid balances and the lifecycle of balances. It is an integral part of online event processing in Amdocs Charging and is responsible for managing account balances information in the charging data store. On-line Charging is dependent on Amdocs Balance Manager in order to manage the balance.

Amdocs Balance Manager provides the following functionalities:

- Querying, debiting, freeing, crediting, and canceling balances
- Calculating actual balance
- Managing multiple currency balances
- Handling recharge requests from Amdocs Replenishment Manager
- Generating notifications based on balance policies
- Supporting market level balance policies
- Interfacing with Amdocs Replenishment Manager

Figure 2-8 show the functions in the balance manager and the rater in the On-line Charging platform.

Figure 2-8: On-line Charging Platform



Call Detail Record Processing

The Call Detail Record (CDR) Processing module enables batch processing of CDR files, and supporting applications and services which are charged in a “hot billing” mode and can be part of the erred event recycling.

On-line Event Processing

The On-line Event Processing module is responsible for the online and real-time transaction-based processing of charging and balance operations request messages that originate from the Mediation Device and the Replenishment Management system, respectively.

Table 2 describes the modules used for on-line charging.

Table 2: On-line Charging Main Modules

On-line Event Processing	Definition of Module
Interface Management	Provides a messaging interface supporting DIAMETER as well as other TCP/IP and UDP/IP messaging protocols
Event Formatting	Formats requests to a common format, parsing and enhancing messages. It also formats response messages.
Customer Identification	This is also called “Guiding to Customer.” Identifies the subscriber and also the paying account associated with the event.
Charging Management	Applies charging processing logic to formatted and guided events, including session-based charging, immediate charging, and Advice of Charge. Accesses.
Event Routing	Part of the Formatting and Routing process. Responsible for routing to the appropriate Charging partition. The routing activity can be either synchronous or asynchronous.
Balance Management	Applies account creation and state changes, and account balance adjustment processing logic to formatted and guided events, including threshold-based policies. Accesses the Charging Data Store.
Rating	Applies rating using pricing schemes and rules defined in the Portfolio Product Catalog. Both the On-line Charging and the Offline Charging systems implement the same Pricing Engine.
Allowance/Performance Indicator Reservation Management	Manages the Performance Indicator reservation and rollback in the same manner that the monetary balance is reserved. The main purpose of this function is allowance reservation, that is, non-monetary balances.
Transaction and Log Management	Provides a transaction-based framework for the concurrent processing of transactions, transaction recovery, exception handling, duplicate transaction handling, and log handling.
Availability Management	Implements the automatic monitoring and failover of On-line Charging resources to an alternate process (active-standby) in the same server or to an alternate server (configuration dependant), supporting High Availability requirements of 99.999% availability

Data Store Management

The Data Store Management module is responsible for the management and data import and export of the Amdocs On-line Charging Data Stores.

Amdocs Billing

Amdocs Billing provides additional applications that can be used selectively or all together to answer wider needs in the area of billing and the financial relationship of the CSR with its customers and partners.

Amdocs Billing and Charging includes the following applications:

- Amdocs Invoicing
- Amdocs Rating
- Amdocs Subscriber Resource Manager
- Amdocs Accounts Receivable
- Amdocs Collections
- Amdocs Replenishment Manager
- Amdocs Voucher Manager
- Amdocs Document Designer
- Amdocs On-line charging (Balance Manager is under On-Line charging)

Revenue Management includes the following mediation and settlement applications related to billing and charging:

- Amdocs Service Mediation Manager
- Amdocs Partner Settlement Manager
- Amdocs Billing Mediation Gateway

Amdocs Billing Mediation Gateway

Amdocs Billing Mediation Gateway gives service providers the agility they need to run their operation in today's dynamic market conditions.

Amdocs Billing Mediation Gateway provides the following business benefits:

- Convergence – One application serving as the gateway to a single converged billing system, overcoming the complexities of multiple accounting data types and formats.
- Prevention of revenue leakage – Amdocs Billing Mediation Gateway integrates with Amdocs Charging and enables end-to-end reconciliation of billable events that enter the system. System processes are centrally monitored to preempt faults and alert on error-prone conditions.
- Quick modifications and adaptations to market needs – Easy-to-use user interface and modular architecture enable service providers to configure business rules themselves, controlling and introducing changes without depending on vendors.
- Integrated error management – Streamlined correction and recycling of errors and the prevention of revenue loss.
- Reduced implementation costs – Through the integration with upstream Amdocs Service Mediation Manager. Amdocs Billing Mediation Gateway is based on the N2B™ platform, providing it with proven stability and agile

configuration capabilities.



Note *N2B™ platform delivers accurate accounting and reporting of IP usage, for better analysis and diagnose of network traffic events. N2B is a trademarked name for a specific network-to-business.*

Amdocs Service Mediation Manager

Amdocs Service Mediation Manager is a carrier-class business infrastructure converged mediation solution that combines data collection, data processing, data synthesis, and data export on a single platform. It collects information from various types of networks and transforms it into business intelligence, enabling providers to understand how their networks are used and to translate this knowledge into new revenue by developing and managing new profitable services.

Amdocs Service Mediation Manager consists of the Network-to-Business platform and other modules. It provides a link between the physical network infrastructure and Operations and Business Support Systems (OSS/BSSs) enabling advanced network and service usage.

Amdocs Partner Settlement Manager

Amdocs Partner Settlement Manager consists of a set of pre-integrated Rating, Pricing, Billing and Financial Settlement modules. Pre-integration enables short setup time, configuration and deployment to production and simplifies integration with upstream legacy mediation and downstream enterprise financial systems.

The main benefits of Amdocs Partner Settlement Manager are:

- Single partner settlement platform recruiting with partners of any styles.
- Manage complete partner life cycle from registration to settlement with partners of any scale.

The Amdocs Partner Settlement Manager has the following features:

- Independent, self-care partners applications shown in [Table 2.3](#)
- Query and reporting tools shown in [Figure 2-9](#)
- Partner Portal shown in [Figure 2-10](#)

Table 2.3: Amdocs Partner Settlement Manager: Self-care Application for Partners

Amdocs Partner Settlement Manager Self-care Application for Partner
Register and offer services for approval.
Update contract, payment and service data.
View reports on-demand and on-schedule
Filter, drill-down and modify reports
Personalized view of graphical reports
Receive revenue reports with greatest ease

Figure 2-9: Amdocs Partner Settlement Manager: Query and Reporting

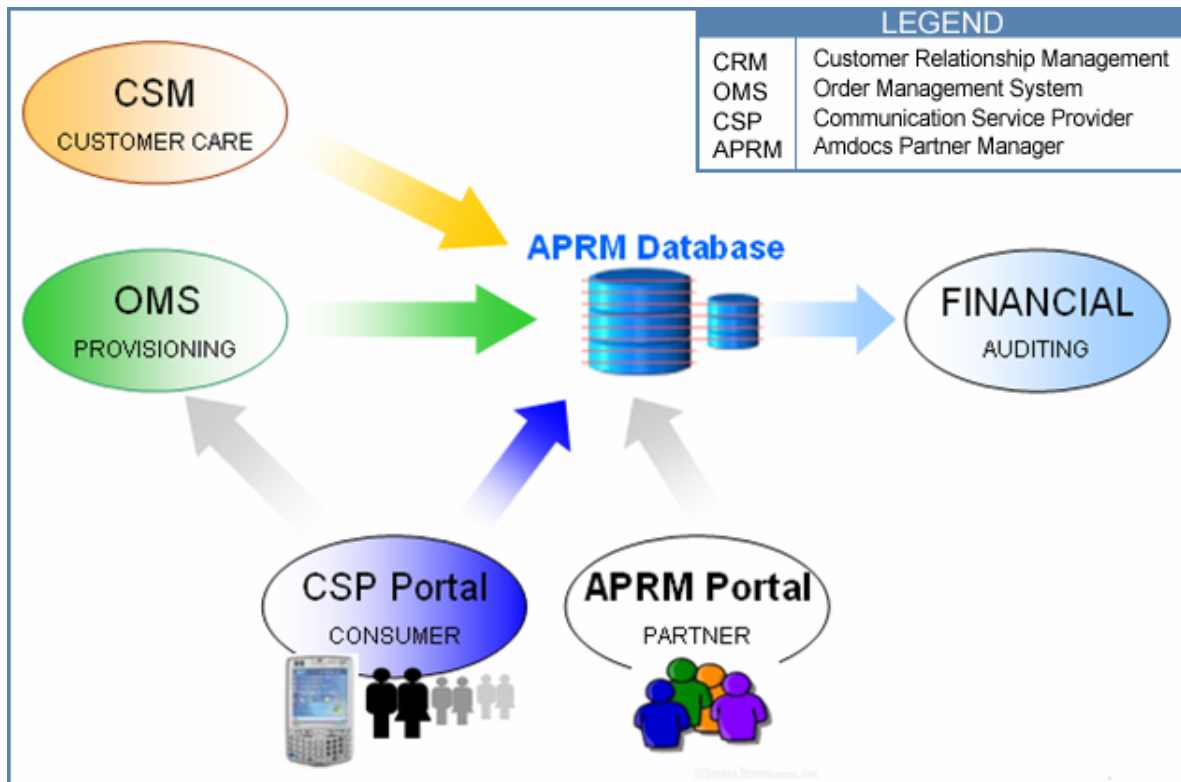
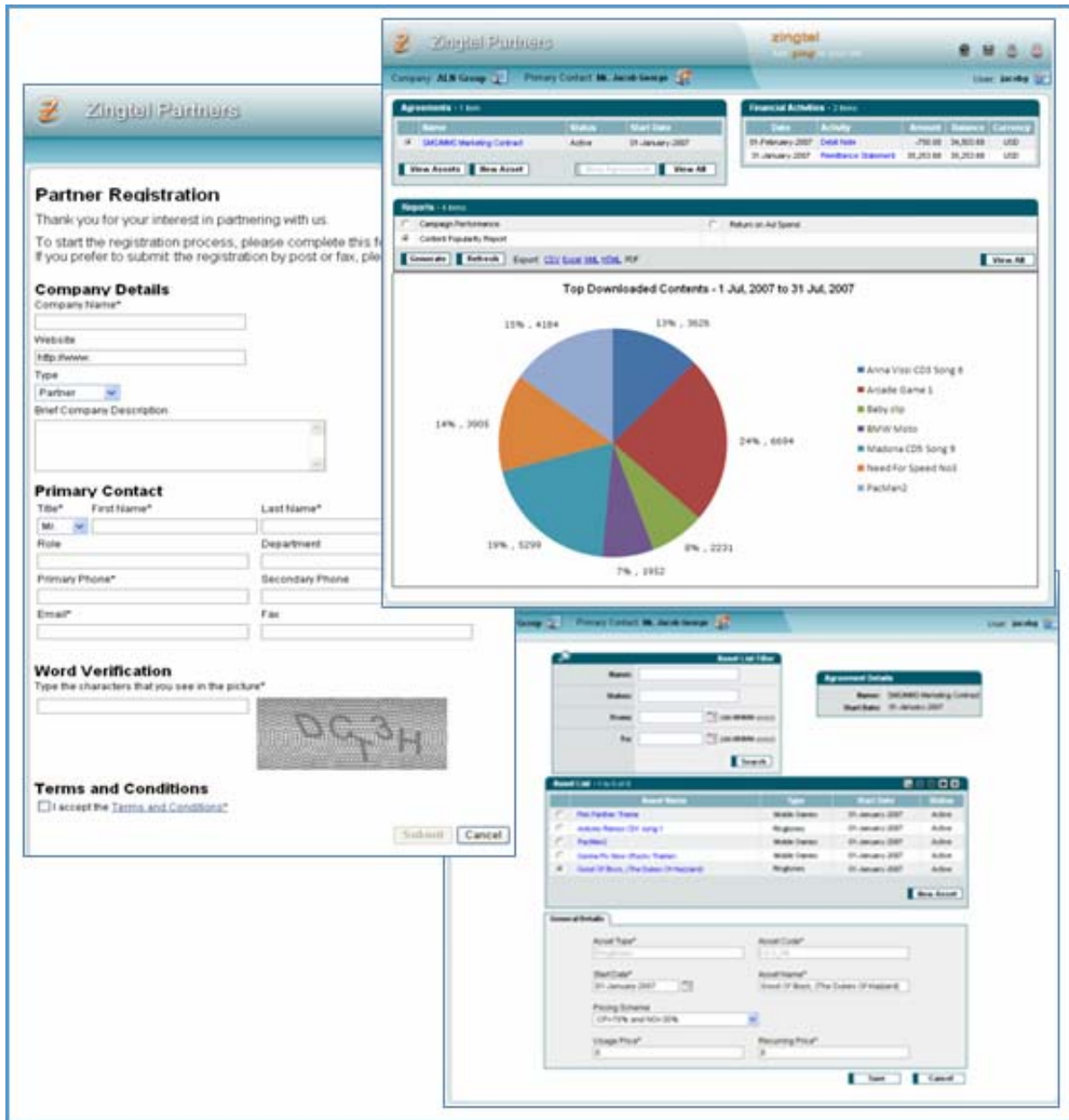


Figure 2-10: Amdocs Partner Settlement Manager: Partner Portal Usability Examples



Amdocs Invoicing

Amdocs Invoicing provides the main communications channel between the service provider and the customer via a periodic billing document. Amdocs Invoicing performs the following functions:

- Providing a convergent bill for next-generation voice, data, content, and commerce services
- Including prepaid and postpaid services in a single convergent bill
- Performing charge and event distribution to support a split bill
- Enabling flexible definition of recurring and one-time charges
- Enabling one-time and recurring rates and discounts
- Supporting flexible cycle definition
- Supporting different business models
- Supporting both scheduled and on-demand bills
- Supporting multi-currency billing
- Providing application programming interfaces (APIs) for interaction with other Amdocs components and third-party systems
- Providing Recurring and One time charges quotes during the ordering process

Amdocs Rating

Amdocs Rating is a pricing engine that provides a variety of rating-related operations, including determining the cost of services used by the customer, and providing advice of charge. Designed to separate the rating functionality from the business logic, Amdocs Rating is an independent and stable rating mechanism.

The rating logic definition is part of Amdocs Portfolio Product Catalog, which contains the definitions of all services, offers, pricing elements, and rating schemes required by a service provider. These definitions can easily be extended as new services are introduced without having any impact on Amdocs Rating.

Tightly integrated with Amdocs Portfolio Product Catalog, Amdocs Rating supports a wide range of marketing strategies and can rate every type of service.

Amdocs Rating supports the true convergence across lines of business, networks, and payment channels of:

- Quad play (wireline, wireless, TV and broadband)
- IP
- Prepaid and postpaid

Amdocs Rating provides rating and other operations, such as advice of charge, across Amdocs Billing. This flexible pricing engine is also central to On-line Charging for real-time rating to Amdocs Invoicing for one-time and recurring charge rating, and to Amdocs Billing Customer Manager for subscriber usage and accumulator queries.

Although the pricing engine carries out the same general activities for all Amdocs Billing applications, the rating of a particular service is dynamic and corresponds to a particular

business demand. This rating is based on a set of functions in the pricing engine and correlates to specific business needs, such as:

- On-line charging
- Offline charging
- Recurring charge rating
- One-time charge rating
- Quote or advice of charge rating
- Pre-rating

These functions can be extended as necessary to cover additional business demands.

Amdocs Subscriber Resource Manager

Amdocs Subscriber Resource Manager is a comprehensive application for managing and allocating resources, providing the following facilities:

- Integrated voice and IP resource management such as, land-line telephone numbers, mobile phone numbers, IP addresses, SIM cards, and user names.
- Assigning and tracking resources

Amdocs Subscriber Resource Manager is comprised of two main modules, Resource Management Configuration and Resource Management Administration. They communicate with each other and with external systems.

Resource Management Configuration

Resource Management Configuration defines the following:

- Resource and package types, such as life cycle and relations with other resource types
- Behaviors and rules for resources and packages

Resource Management Configuration features the following resources:

- MSISDN
- SIM/IMSI
- Usernames
- Private numbers (for VPN)
- External IP addresses
- Internal IP addresses

Resource Management Administration

Resource Management Administration contains the following:

- Tools for resources and packages based on the rules defined in Resource Management Configuration.
- Support for new resources because all definitions for the management and allocation of resources are table-driven and rule-based
- Options for the resource administrator to act on resource activities and package activities

Amdocs Accounts Receivable

Amdocs Accounts Receivable includes two major subsystems: the “traditional modules” and the “journaling and general ledger (GL) extract” modules.

The Amdocs Accounts Receivable traditional modules maintain postpaid customer account balances by responding to the financial activities of Amdocs Invoicing and managing financial activities such as payments, credits, back outs, fund transfers, deposits.

The Amdocs Accounts Receivable journaling and GL extract modules track financial activities performed both within Amdocs Accounts Receivable and by external components. They extract and report general ledger information to external general ledger systems and also provide financial reports and auditing of performed activities.

As a multi-currency module, Amdocs Accounts Receivable manages accounts in various currencies and receives and applies payments in any currency supported by the system.

Amdocs Accounts Receivable performs business-essential functions and account management activities such as credits, credit notes, refunds, write-offs, back outs, fund transfers, disputes, and manual cash allocations.

Amdocs Accounts Receivable performs the following functions

- Receives and applies payments to accounts
- Creates and maintains deposits
- Generate financial activity summary reports
- Analyze financial transactions
- Translate activities into journal entries.
- Accumulate and map journal entries to GL physical accounts

Amdocs Collections

Amdocs Collections functions identify delinquent accounts, assign them treatment plans, and automatically perform and monitor the designated treatment. The customer communication function in Amdocs Collections is responsible for defining and generating customer communication requests system – providing the ability to define and create channels for communication with customers. For each channel, several types of communication may be defined.

Amdocs Collections consist of the following processes:

- Decision Engine - Evaluates each account referred to Amdocs Collections and decides whether the account requires collections treatment.
- Step Management using the Amdocs Process Manager Engine - Defines and initiates the collection activities according to the appropriate treatment policy.
- Real-time Collection Treatment - provides real-time monitoring of the collection treatment, and as a result performs activities such as stop collection treatment due to payment, resume collection treatment due to back-out or credit reversal and re-evaluate collection treatment due to a change in customer attributes.

- Payment Arrangement - provides the mechanism that allows the CSR to negotiate with customers and offer them acceptable plans to pay their debts. These plans are based on multiple installments over a defined period of time, including the milestones at which the customer is re-evaluated for fulfilling the arrangement.
- Customer communication system - provides the ability to define and create channels for communication with customers. For each channel, several types of communication may be defined.

Amdocs Replenishment Manager

Amdocs Replenishment Manager recharges and adjusts prepaid account balances using various recharge methods, such as credit card, voucher, direct debit and cash.

Amdocs Replenishment Manager performs the following functions:

- Monitors and logs recharge transaction details
- Enables the viewing of recharge transactions and prepaid balance information
- Provides access channels from other systems, such as ATMs (automated teller machines), call centers, and IVR (interactive voice response) systems.
- Provides a variety of queries and reports on recharge activities and balances

A prepaid account is recharged when a subscriber makes a payment and the prepaid account balance is increased accordingly. A subscriber may have more than one balance to recharge. Each balance can be dedicated to a different event or service, such as long distance calls or SMS. Multiple subscribers can share a balance, so that events of different subscribers are applied to the same balance.

Amdocs Replenishment Manager uses open APIs to interface with other Amdocs Billing applications such as On-line Charging and Amdocs Voucher Manager. It also publishes recharge transactions to other applications, such as Amdocs Invoicing, Amdocs Billing Customer Manager.

Amdocs Replenishment Manager interfaces with Amdocs Voucher Manager to check the voucher's validity and value.

Amdocs Voucher Manager

Amdocs Voucher Manager is an added-value component that manages the life cycle of recharge vouchers, including the following:

- Ordering of vouchers from manufacturers and their distribution to dealers
- End-to-end automation of the voucher life cycle to increase operating efficiency
- Support for a wide variety of vouchers to facilitate increased payment flexibility
- Encryption and voucher tracking capabilities to reduce the risk of fraud
- Efficient handling of dealerships to enable a rapid extension of voucher operations

Amdocs Document Designer

Amdocs Document Designer allows you to create template designs and transactional documents. Template structures are defined by specifying conditional processing and the printed layout.

The following describes the Amdocs Document Designer functionalities in the Billing platform.

- Creates template components for summary and detail pages. A page can contain static and variable text, images, and data.
- Creates customer bills, invoices, statements, and letters from like-defined templates.
- Facilitates the flexible design of personalized templates, using a table-driven, rule-based architecture.
- Optimized for mass production in volume, performance, and scalability for correspondence and transactional documents such as bills, invoices, and statements.
- Unicode-enabled, supporting both single byte and multi-byte language encodings. Documents can be created in all European and Asian languages such as Chinese, Japanese, and Korean.
- Process predefined numeric, text, and image content into print-ready form that can be distributed via paper, Web, and electronic media. You can process pre-calculated information from an incumbent billing or accounting system into industry-standard print, Web, or electronic data files.
- Print files can be sent to a print vendor for transformation to paper
- Store Web files on servers for download or transmission by email
- Electronic files can be used by external data processing systems

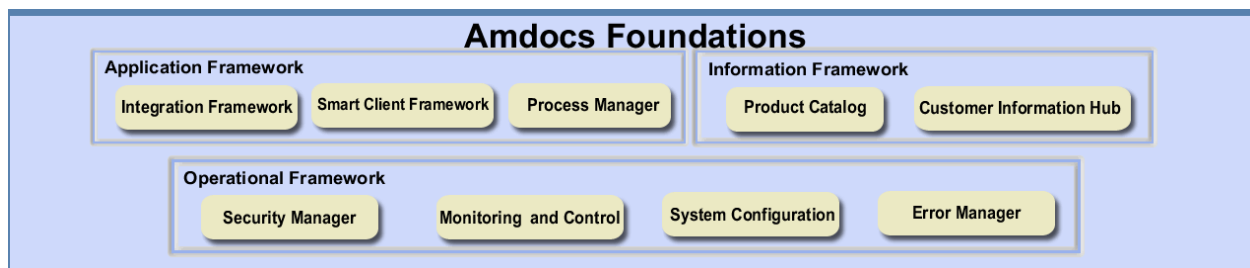
3 Amdocs Foundations

Amdocs Foundations is a set of fundamental software components used by Amdocs products. The foundation software components are a set of tools and components that provide common functionality and communication mechanisms for Amdocs portfolio application modules. These components:

- Achieve consistency, coherency and re-use across the Amdocs portfolio
- Achieve interoperability across the Amdocs portfolio and the enterprise
- Consistently manages customer and product information across Amdocs portfolio and the enterprise
- Ensure a positive and seamless user experience
- Enable business agility and simplify integration through Service Oriented Architecture (SOA) and business process management
- Reduce Total Cost of Ownership by providing unified tools for application deployment, operation and management

Figure 3-1 shows the foundation modules for all the Amdocs applications.

Figure 3-1: Amdocs Foundations



Amdocs products use a common architecture, including the following shared tools and services:

- Amdocs Integration Framework
- Amdocs Smart Client Framework
- Amdocs Process Manager
- Amdocs Portfolio Product Catalog
- Amdocs Customer Information Hub
- Amdocs Security Manager
- Amdocs Monitoring and Control
- Amdocs System Configuration
- Amdocs Error Manager

This standard foundation simplifies installing, configuring, integrating, and monitoring Amdocs applications by providing a common set of design time and runtimes at the foundation level.

Amdocs Integration Framework

Amdocs Integration Framework is a common standard-based foundation for integration between Amdocs applications and external systems. As such, it is not intended to replace middleware products such as Enterprise Application Integration bus (EAI) and Enterprise Service Bus (ESB). Rather, it acts as a uniform abstraction layer that retains portability across the EAI and ESB technologies.

Amdocs Smart Client Framework

Amdocs Smart Client Framework is the next generation presentation layer for all Amdocs agent/back-office facing applications. It provides a common user experience for all agent-facing Amdocs applications. Amdocs Smart Client Framework is provided and supported as part of the licensing agreements for Amdocs Portfolio products.

- Amdocs Smart Client Framework Runtime – Java based user interface framework providing comprehensive UI infrastructure including a robust palette of user-interface controls, multiple document interface, menus, toolboxes, client-side validation, inter-form communication, and much more. In addition, Amdocs Smart Client Framework provides central management and deployment via Java Web Start.
- Amdocs Smart Client Designer – The Smart Client designer is a WYSIWYG, drag and drop environment to build and customize Amdocs Smart Client forms. Smart Client designer also builds and customizes menus, toolboxes and other workspace elements. These tools are provided as Eclipse plug-ins to provide an integrated development environment.

Amdocs Smart Client Framework enables service providers to increase productivity through higher application performance and rich usability, and to reduce costs with centralized administration and efficient development/customization of smart client user interfaces.

Amdocs Process Manager

Amdocs Process Manager is the Amdocs Business Process Management (BPM) foundation. It enables the Amdocs applications to define, execute, and monitor long-lived, multi-step business process flows that can span multiple applications and users.

Amdocs Process Manager supports application-level flows and can be used in portfolio-level flows. It is used by many of Amdocs products such as:

- Amdocs CRM
- Amdocs Ordering
- Amdocs Collections
- Service Management Suite

Amdocs Process Manager comprises the following modules, which cover the main stages of business process management:

- Process Editor – Used by developers to design and implement process definitions according to the process model created by business analysts.
- Process Configuration and Deployment – UI-based tools for configuring and deploying process definitions.
- Process Engine – A runtime engine that executes the process instances based on process definitions and runtime business parameters.
- Process Monitoring and Management – UI-based tools for operational monitoring and managing of process instance progress at runtime.

For business monitoring, Amdocs Process Manager integrates with third-party modeling and BAM (Business Activity Monitoring) products.

Amdocs Portfolio Product Catalog

Amdocs Portfolio Product Catalog supports service provider efforts to implement a broad range of marketing strategies by enabling it to offer numerous bundles, services and pricing structures to customers. Amdocs Portfolio Product Catalog has the following key functionality:

- Maintaining a sophisticated catalog of pricing definitions for products and bundles, and customer packages, all of which are influenced by a wide array of variables.
- Maintaining complex services and bundles structure with inter-related relations and dependencies
- Support of all current and future services through the ability to define new-generation network and IP services, as well as circuit-switched and intelligent network voice services.

Amdocs Portfolio Product Catalog enables the service provider to offer services that comprise a variety of products in different lines of business, including mobile networks, long distance calls, private physical and virtual network services, data traffic such as GPRS or UMTS sessions, and Internet-based services such as information, email,

interactive games, and other entertainment services. Event processing integrates all the functions required for the receipt and processing of usage events transferred from various sources, such as GSM switches, UMTS and GPRS networks, fixed network switches, IP application servers, and roaming clearinghouses.

Amdocs Portfolio Product Catalog supports Ordering and Billing systems as described in the following sections.

Ordering

Amdocs Portfolio Product Catalog stores all product information with ordering process definitions. Defined items can be re-used, enabling fast product definition and time to market. The Amdocs Portfolio Product Catalog serves as the master product catalog both for all lines of business and all users, supporting product versions and management of the entire product lifecycle, defining eligibility and compatibility rules.

Billing

Amdocs Portfolio Product Catalog groups service definitions into billing offers. Each offer includes definitions for a set of services. Definition for each service bundle rating and discount models for various event types. A pricing package can include multiple services, with rating rules, event discounting rules, charges, free allowances, and benefits.

Amdocs Customer Information Hub

Amdocs Customer Information Hub provides a common Customer model across Amdocs products.

Amdocs Customer Information Hub includes customer entities and the mechanisms to access these entities, for all Amdocs products. It is based on customer profiles – definitions of customers that include personal details, account details, subscriber details, and any related organizational details. The Customer Information Model is defined by the physical data model of the following:

- Amdocs CRM
- Amdocs Ordering
- Amdocs Billing.

Amdocs Customer Information Hub foundation services are customizable technical services. Technical services do not perform any business functions, but rather provide infrastructure for services to have the capabilities needed to execute successfully.

Amdocs Customer Information Hub conforms to the TeleManagement Forum (TMF) SID (Shared Information Data Model) standards. The Customer Information Hub is a suite of s0065rvicees that enable access to the Customer logical data model in a uniform way. These services can be invoked standard protocols such as Web Services.

Amdocs Security Manager

Amdocs Security Manager is a common application-level security framework across the portfolio, providing protection to enterprise-sensitive information by implementing:

- Unified security model with extensibility capabilities
- Third party integrations (such as Sun One, Site Minder, and Tivoli)
- Security-related industry standards

Amdocs Security Manager is used for the following:

- Authentication – Implementing a single sign-on mechanism that secures the integration between Amdocs applications and uses the option for a single point of access. Amdocs Security Manager has multiple authentication services, multi-step authentication, user profile information, and credential transparency.
- User account management – Enabling/disabling accounts, account expiration time, account lockout mechanism, credential expiration time.
- Authorization – Authorization of roles, protection of all application resources, and roles hierarchy.
- Security audit logging – Auditing of all security related events.
- Session management – Session monitoring mechanism, session-level idle timeout, session revocation mechanism, and session limit control.
- Encryption services – Using the SUN encryption provider for JCE.

Leveraging standards and pervasive technologies, Amdocs Security Manager provides improved support for Sarbanes-Oxley (SOX) requirements across the Amdocs Portfolio through traceability and auditing. It answers the complex security requirements of service-oriented architecture (Amdocs Smart Client Framework) and Amdocs Integration Framework) and allows interoperability with incumbent systems.

Amdocs Monitoring and Control

Amdocs Monitoring and Control is a centralized monitoring and control system across all Amdocs products that enable consistent and efficient operation of the portfolio. This system provides:

- Unified monitoring and control capabilities across different products and platforms
- Third-party integrations (IBM Tivoli, CA Unicenter, and HP O/V)
- Application management-related industry standards
- Monitoring and measuring of performance and availability of mission-critical applications across the portfolio

Amdocs Monitoring and Control anticipates failures by detecting deviations from normal application behavior patterns. It automates recovery based on predefined remedial action, notifies key personnel when applications are about to fail or have failed, and provides visibility into applications in a variety of levels of detail.

Amdocs System Configurator

Amdocs System Configurator is a set of tools for developers, testers, and operators to configure the various operational parameters of Amdocs products:

- For developers – A tool to define operational parameters and use them from within the module's code.
- For customizing developers – A tool to extend basic functionality by altering parameters, adding parameters, and creating code to use the current and the new parameters.
- For testers/operators – A tool for editing parameters to tune the way the applications work.

Amdocs System Configurator is adopted by Amdocs CRM, Amdocs Process Manager, and Amdocs Integration Framework and includes the following modules:

- Configuration Repository
- Configuration Editor
- Deployment Module
- External Validation Tool

Configuration Repository

The Configuration Repository is a centralized storage for the configuration of an entire installation environment. It contains all the configuration parameters of all installed components. The repository contains the actual configuration data, as well as supporting meta-data, such as descriptions, type information, validation rules, and hints for editors.

Applications do not access the repository directly. Instead, the Deployment Module extracts a portion of the repository for their use.

Configuration Editor

The Configuration Editor is a GUI based tool used for editing the content of the configuration repository. The tool is used by system administrators to view or edit the data in the repository or modify the repository.

Deployment Module

The Deployment Module is responsible to deploy a new configuration from the Configuration Repository into all servers and instances (deployment units) in the logical environment. The module is activated when the user selects the `Deploy Configuration` option in the Configuration Editor, or when the user defines a scheduled task.

External Validation Tool

The External Validation Tool is a set of utilities demonstrating the capabilities of Amdocs System Configurator (ASC).

The external validation tool validates configuration that is not part of the configuration file. It works with list of validation rules and is a collection of validation functions, such as:

- Validate parameters value with external resources
- Database-connection-check
- GUI and execution

The External Validation Tool is accessible for ASC users to validate application configurations.

Amdocs Error Manager

Amdocs Error Manager is an integrated Customer Management product and has the following properties:

- Uses the Amdocs Service Mediation Manager infrastructure
- Receives rejected records from record processing systems
- Resolves the rejected records
- Sends the resolved records back to the originating system

Amdocs Error Manager is a GUI-based product that helps business managers to organize and assign incoming faults to investigative teams. The main interface for system management and error investigation and resolution is the Amdocs Error Manager Console. The core of the Amdocs Error Manager contains all its logic and most of its functionality. It is a module/ISM on the revenue management Amdocs Service Mediation Manager platform.



Note Most of the features are Amdocs Service Mediation Manager (ASMM) infrastructure features.

Managers can create rules that are automatically applied to incoming records, to rectify faults that occur due to known anomalies. For uncorrected records that manage to pass through the first-level filter, users can create automatic assignment rules that route them to teams for further investigation. Through the extensive use of rule-based correction and assignment, the investigation process is significantly accelerated, enabling the company to take effective corrective action in the least amount of time.

Faulty records received in external data formats, are converted into a common and unified internal format and stored in the centralized relational database. A central repository allows managers to identify and fix system errors originating from multiple sources within a single resolution platform. The database helps financial and marketing managers to create trend and analysis reports to identify problematic service categories, inconsistent process areas, and faulty hardware.

Amdocs Error Managers pre-integration with the Amdocs product portfolio enables service providers to operate a single system with standard data exchange, minimum interface complexity, and lower implementation costs.

Amdocs Error Manager modularity and open architecture allow it to be deployed either as a standalone product with third-party systems, or with other Amdocs products, such as Amdocs Charging, as part of a broader solution.

4 Product Integration

Product integration refers to combining functionality between Amdocs Portfolio products. Amdocs provides integration between the following application pairs:

- Amdocs Billing and Amdocs CRM
- Amdocs Billing and Amdocs Ordering
- Amdocs Self Service and Amdocs CRM
- Amdocs Self Service and Amdocs Ordering
- Amdocs CRM and Amdocs Ordering

Amdocs incorporates all Amdocs Portfolio software products into a single coherent suite of applications based on service-oriented architecture. The back-end functionality is composed of modular and reusable components. The following list defines the implementation of service-oriented architecture:

- Exposing the suite's server-side functionality as standard services
- Promoting the composition of automated functional flows across the suite of applications
- Aiding the development of composite user interfaces on top of Amdocs applications
- Advancing the integration of Amdocs applications with external applications
- Prohibiting the functional overlap between the existing applications

Amdocs defines a single coherent information model with clear definitions of ownership by applications. This model is shared by all applications and serves to enhance seamless mutual understanding of information semantics across applications. It also facilitates the development of information exchange mechanisms with little information overlap and redundancy between applications.

Amdocs Billing – Amdocs CRM

Integrating Amdocs Billing and Amdocs CRM enables customer service representatives (CSRs) to access all of a customer's service and billing information from a single entry point. The CSR can review service and billing information, create adjustments, receive payments, performs collection actions, and resolve all issues on any call.

In the integrated system, Amdocs CRM serves as the central front-end for handling all customer services and billing matters, where the main integration points are:

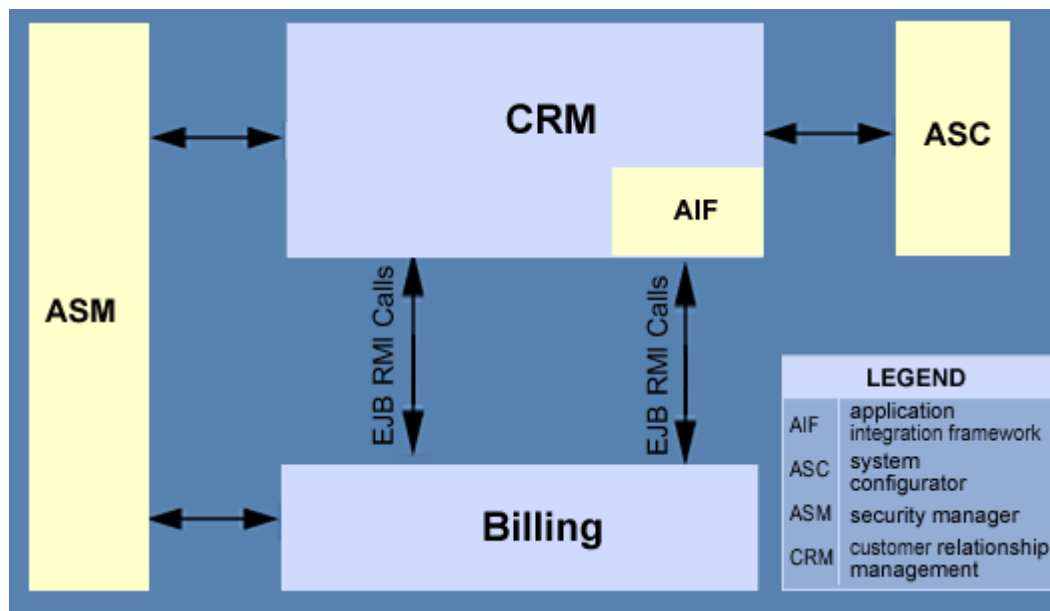
- Customer model – the customer model is maintained in both products, with the majority of data stored in Amdocs Billing.
- Integrated flows – activities that originate in one product and involve actions in the other product, such as getting billing information, generating financial transactions, performing collection activities, and creating the customer model entities.

Amdocs CRM uses the following portfolio foundation applications:

- Amdocs Integration Framework – the service repository through which all service calls are made
- Amdocs System Configurator – all Amdocs CRM integration related configuration properties are implemented in Amdocs System Configurator
- Amdocs Security Manager – Amdocs CRM Single Sign On is integrated with Amdocs Security Manager

Figure 4-1 illustrates the integration between Amdocs Billing and Amdocs CRM.

Figure 4-1 Amdocs Billing – Amdocs CRM Integration



Amdocs Billing – Amdocs Ordering

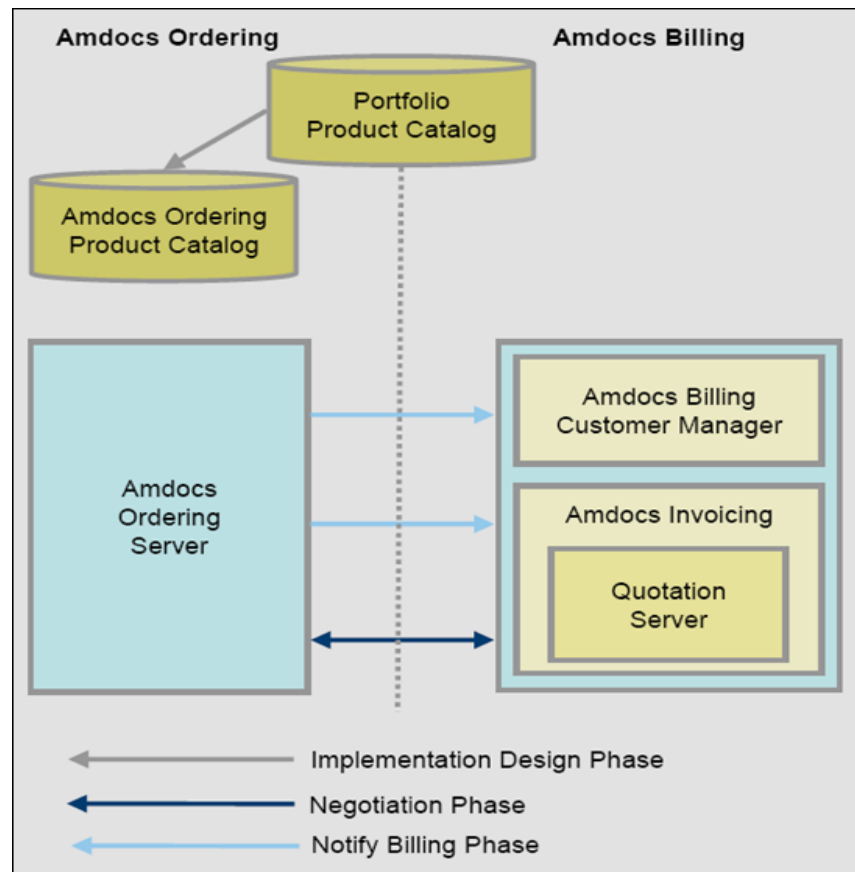
Integrating Amdocs Billing and Amdocs Ordering is based on synchronous calls from the Amdocs Ordering server to Amdocs Billing. Amdocs Ordering manages several processes such as orders, products and billing.

Amdocs Ordering main functionalities are:

- Subscriber management – operations on a subscriber, such as create, modify, delete, and cancel, are initiated by Amdocs Ordering and then sent to Amdocs Billing. This includes adding and removing offers from group level nodes in the customer hierarchy.
- Getting quotes – calls to Amdocs Billing receive a quote charges
- Creating charges – creates recurring and one-time charges in the invoicing system when the order is completed
- Using the product catalog – uses a central catalog that stores all the relevant information for the ordering process. This information includes pricing, discounts, service description and definitions, and resources

Figure 4-2 shows the functional architecture of the integration:

Figure 4-2 Amdocs Billing – Amdocs Ordering Functional Integration



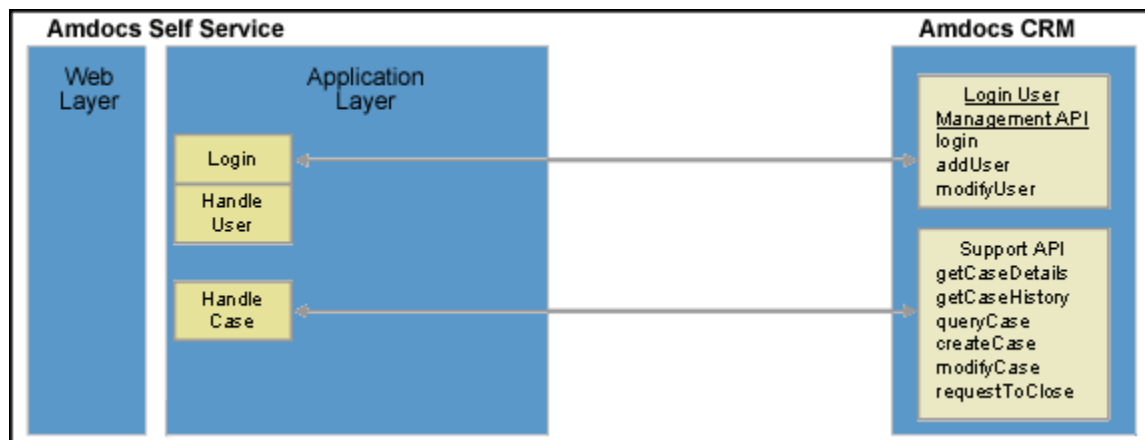
Amdocs Self Service – Amdocs CRM

Integrating Amdocs Self Service and Amdocs CRM provides CRM functionality in the self service application, such as clients can managing their contact list and retrieving their own profile. The primary methods of interaction are:

- Business services that invoke synchronous EJB RMI APIs. Some of these APIs are executed through Amdocs Integration Framework (AIF) client, which wraps the RMI calls.
- Feeds that handle asynchronous messages from JMS queues and update the Self Service database accordingly

The **Figure 4-3** illustrates the integration between Amdocs Self Service and Amdocs CRM.

Figure 4-3 Amdocs Self Service – Amdocs CRM Integration



The integration between Amdocs Self Service and Amdocs CRM includes the following functionality/components:

- Customers and users are defined as:
 - Customers in Amdocs Self Service have a corresponding Person ID in the Customer Integration Hub domain, which is registered in Amdocs CRM
 - Users are registered as Web Users in Amdocs CRM
- Create customer and customer maintenance.
- Interactions – When customers perform certain actions in Amdocs Self Service, corresponding interactions are recorded in Amdocs, classified by topics to track customer activities. The functionality may be customized to create interactions when required.
- Trouble ticketing – Amdocs Self Service replicates cases that are related to its users. For each case, it stores the ID, status and user.

Amdocs Self Service – Amdocs Ordering

Integrating Amdocs Self Service and Amdocs Ordering provides the following main functionalities:

- Catalog browsing – your company’s customers can browse the offer catalog stored in the Amdocs Self Service database. The offer catalog is retrieved using a feed mechanism.
- Order capture – order capture process is defined and managed in Amdocs Ordering. Amdocs Ordering accumulates the state of the order as follows:
 1. Amdocs Ordering checks for customer eligibility and availability and for product compatibility using business services.
 2. Amdocs Self Service collects product configuration details and other order details from your company’s customer and communicates them to Amdocs Ordering.
 3. Amdocs Self Service presents the prices of the selected and configured product, according to the quotation service invoked by Amdocs Ordering to a quotation server (such as is present in Amdocs Billing)
 4. The order can be handed over between different channels, such as from Amdocs Self Service web channel to the Amdocs Ordering call-center UI.
 5. The Amdocs Self Service user can save an order and subsequently resume it.
 6. Once the data is complete, Amdocs Self Service instructs Amdocs Ordering to submit the order, after which a confirmation is displayed to the Amdocs Self Service user.
 7. The Amdocs Self Service user can view the details of a saved order, see its status and provisioning situation, and can cancel such an order
 8. Order fulfillment and tracking – Amdocs Ordering completes the process, as follows:
 9. Makes available operations that expose order status information to Amdocs Self Service.
 10. Makes available operations that allow order maintenance and cancellation from Amdocs Self Service.
- Assigned Product browsing – Amdocs Ordering provides operations that allow Amdocs Self Service to retrieve the assigned products for the customer for viewing and order initiation, to allow such modifications as adding components, removing existing components, changing attributes.

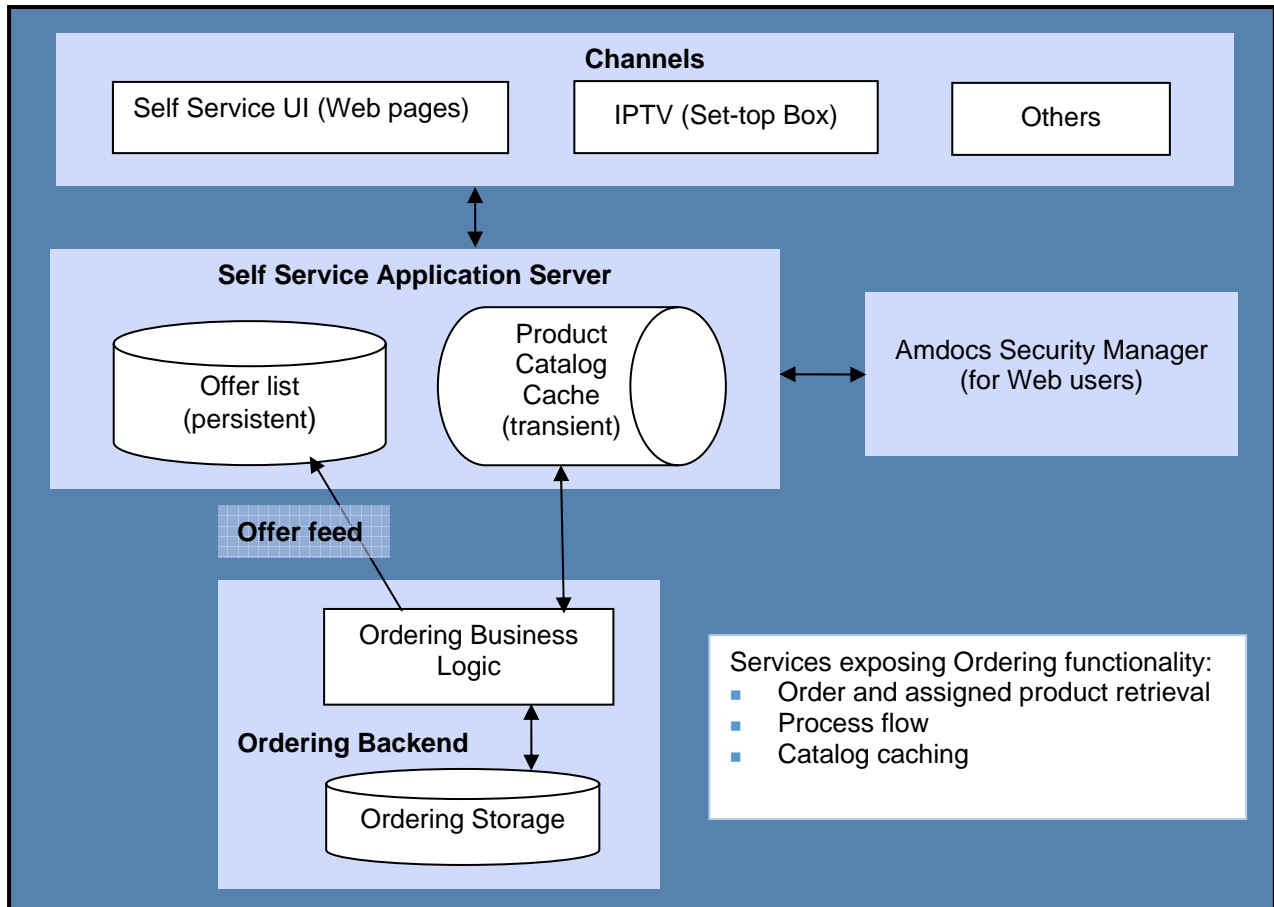
The functional architecture of the integration has the following elements:

- Amdocs Ordering is single master of:
 - Order and Assigned Product data
 - Business Process
 - Business Logic
- Amdocs Self Service:
 - Does not run business processes
 - Does not store ordering data
 - Executes operations exposed by Amdocs Ordering
 - Executes presentation logic relevant to the channels supported by Amdocs Self Service

The previous integration architecture release remains supported, where the client uses stateless APIs from Amdocs Ordering to construct the order and then submits the order to Amdocs Ordering for background processing. Ordering IPTV (set-top box) continues using the previous architecture.

Figure 4-4 outlines the interaction between Self Service and Amdocs Ordering.

Figure 4-4 Amdocs Self Service – Amdocs Ordering Integration



Amdocs CRM – Amdocs Ordering

Integrating Amdocs CRM and Amdocs Ordering to provide the following main functionalities:

- Unified user interface framework, giving consistent look-and-feel for appearance and functional behavior
- Single sign-on between Ordering and CRM
- Unified menu

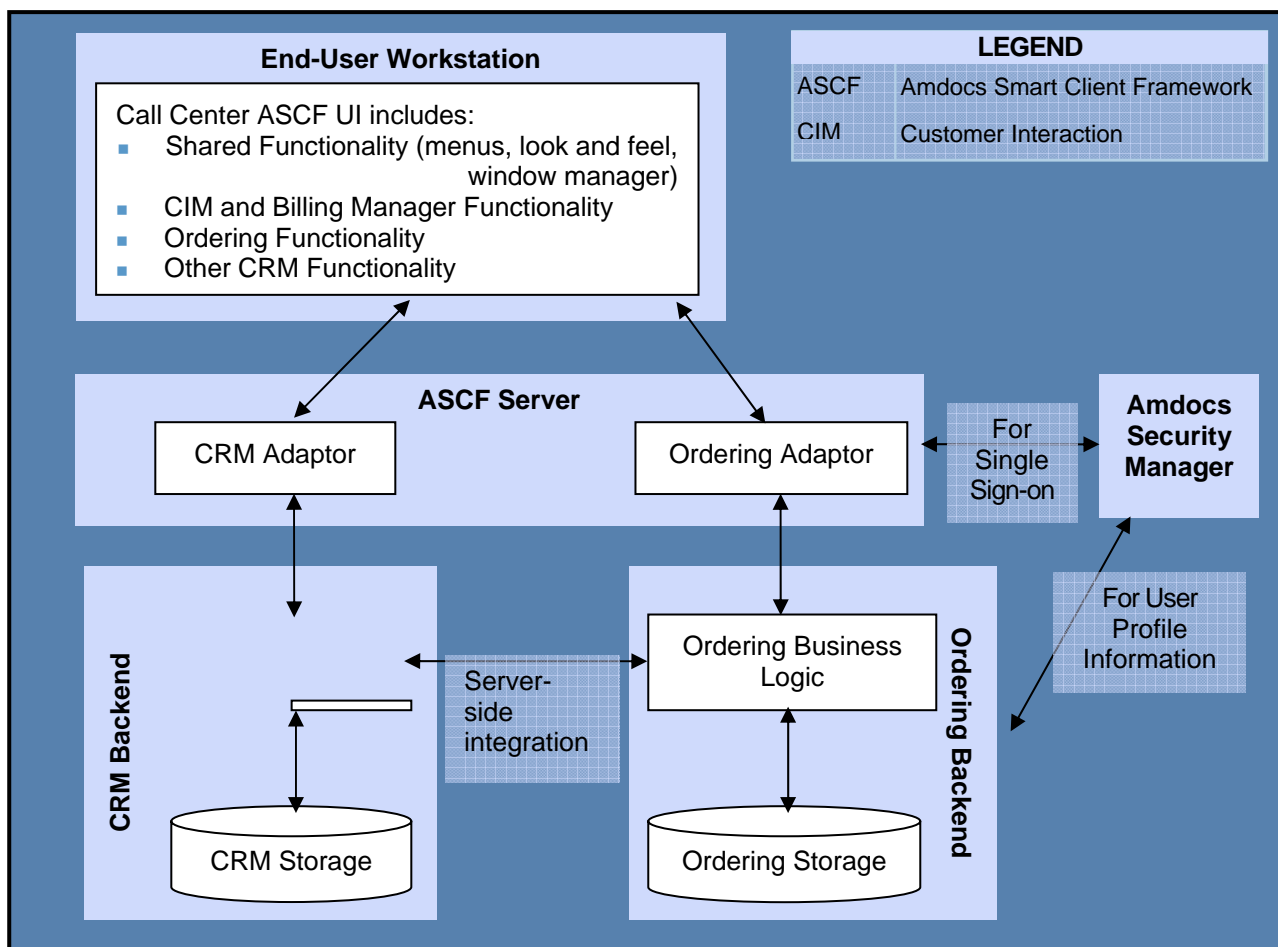
- Cross-application flows as follows:
 - Launch-in-context of Ordering screens from relevant CRM CIM screens
 - Allows ordering flows for anonymous customer, with customer and billing profile creation or identification in the middle of order processing
 - Supports two modes in the integration: Old API and Single Order
- Selection of pre-paid buckets or post-paid pay channels for charge and distribution
- Representation of Ordering information in CRM CIM screens
- Representation of Subscription information in CRM Billing Manager screens

The integration between Amdocs CRM and Amdocs Ordering is achieved by the following techniques:

- Most of the integration is through the GUI – the Order Management System GUI is available from CRM GUI so that the menus-options are the same.
- Ordering retrieves customer profile information from CRM by a service exposed by CRM
- Ordering replicates order-header and subscription-header to CRM by APIs exposed by CRM

Figure 4-5 shows a summary of the functional integration architecture:

Figure 4-5: Amdocs Ordering integrated with Amdocs CRM



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