IUT225

Energy Data Management

THE BEST-RUN BUSINESSES RUN SAP

- SAP IS-Utilities/Customer Care Service 471
- 2003/Q2
- Material number: 5006 2382

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Course Prerequisites

- IUT 110 Introduction to the IS-U/CCS System
- IUT210 Master Data and Basic Functions
- IUT 220 Device Management

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Target Group

- **Audience:**
  - **Project leader**
  - **Project team**
  - **Consultants**
- **Duration: 2 days**

User notes

- These training materials are **not a teach-yourself program**. They compliment the explanations provided by your course instructor. Space is provided on each page for you to note down additional information.
- There may not be sufficient time during the course to complete all the exercises. The exercises provide additional examples that are covered during the course. You can also work through these examples in your own time to increase your understanding of the topics.

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Course Overview

Contents:

- Course Goals
- Course Objectives
- Course Content
- Course Overview Diagram

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Course Goals

This course will prepare you to:

- **Get to know SAP EDM**
- **Explain the integration of SAP EDM in IS-U/CCS.**
- **Display the structure and use of the EDM repository**
- **Describe interfaces to and from EDM**
- **Learn how to operate the EDM system**
- **Understand the Customizing settings of the EDM system**

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Course Objectives

At the conclusion of this course, you will be able to:

- **Name the use of EDM by market participants in a liberalized energy market**
- **Illustrate how EDM can be used in the energy market to manage load profile data.**
- **Discuss the integration of profile management into IS-U/CCS.**
- **Explain and set up the point of delivery.**
- **Explain and demonstrate how to create a profile header**
- **Demonstrate the Profile Allocation.**
- **Explain and demonstrate profile values and the profile import process**
- **Create and use synthetic and formula profiles in EDM**

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Course Content

Preface

Unit 1	**Course Overview**	Unit	6	**Profile Allocation**
Unit 2	**Introduction to EDM**	Unit	7	**Importing Profile Values**
Unit 3	**Overview of the EDM functions**	Unit	8	**Managing Profile Values**
Unit 4	**EDM Relevant Data Objects**	Unit	9	**Formula Profiles**
Unit 5	**Profile Header**	Unit	10	**Synthetic Profiles**

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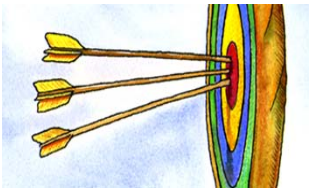
Introduction to EDM: Unit Contents

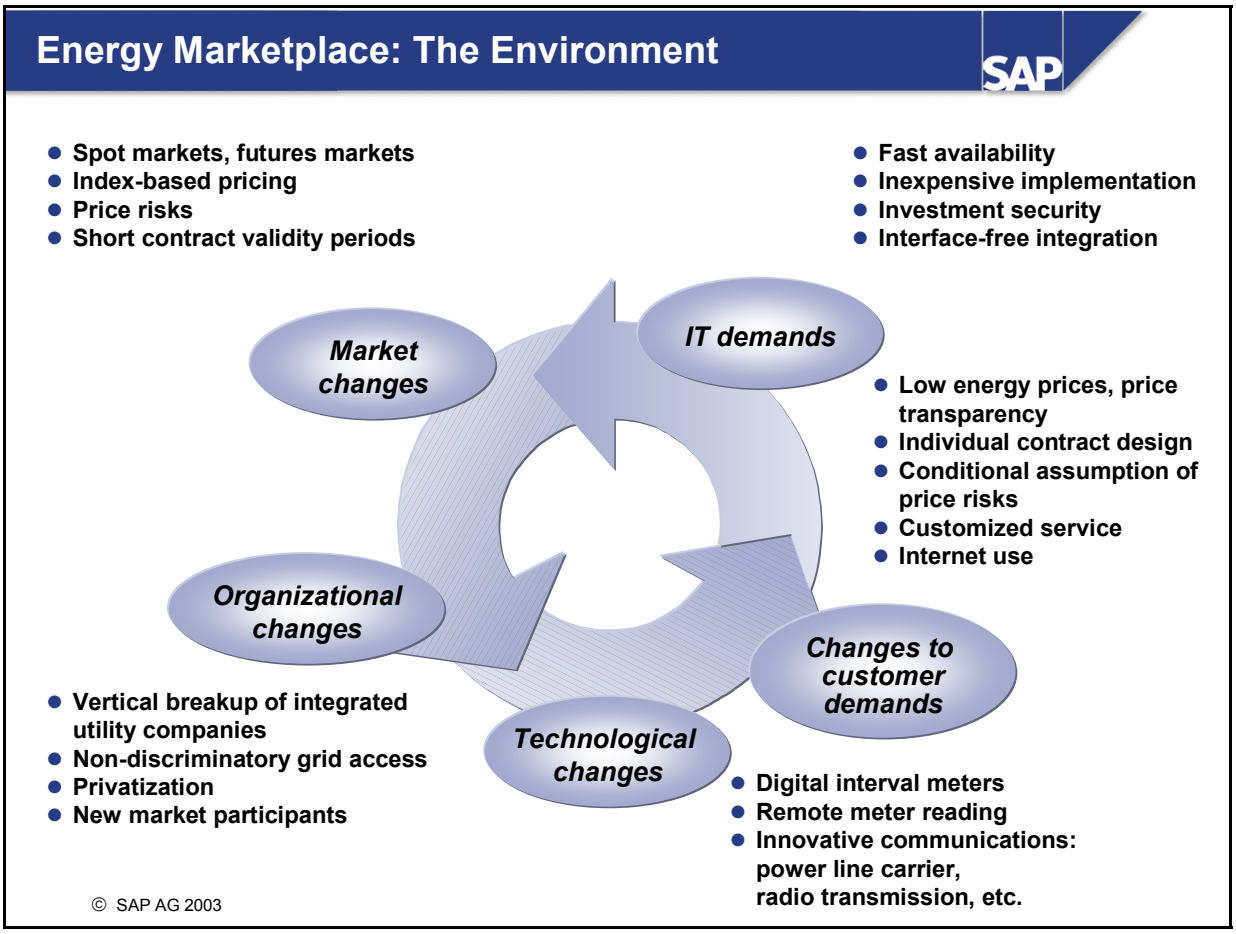
- The need for EDM in the Marketplace
- Overview of Profiles
- Overview of Complex Billing

Introduction to EDM: Unit Objectives

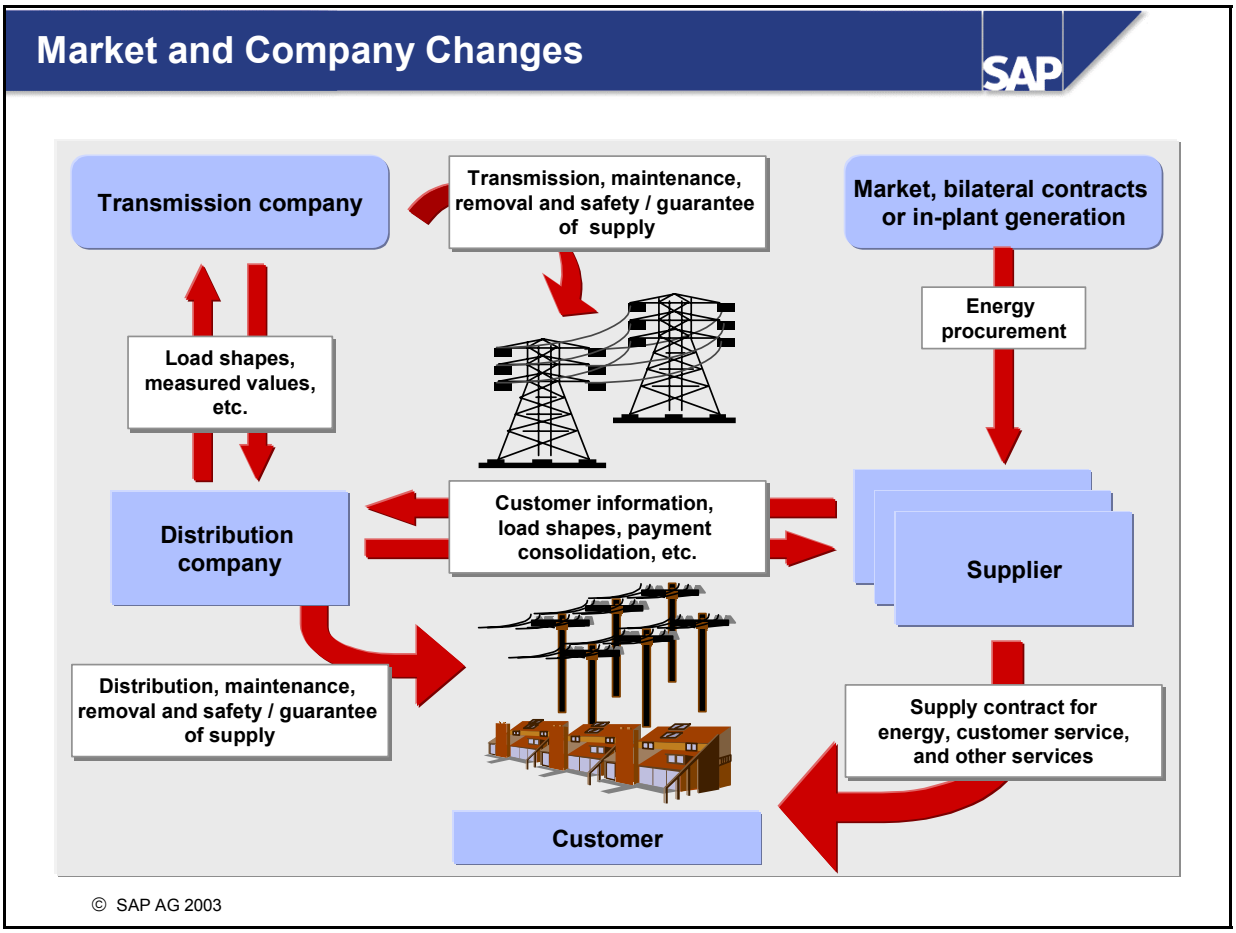
At the conclusion of this unit, you will be able to:

- **Identify the need for an EDM solution**
- **Define profiles**
- **Discuss the components of complex billing.**
- **Describe the general functions of deregulation.**
- **Clarify course expectations and recognize objectives.**





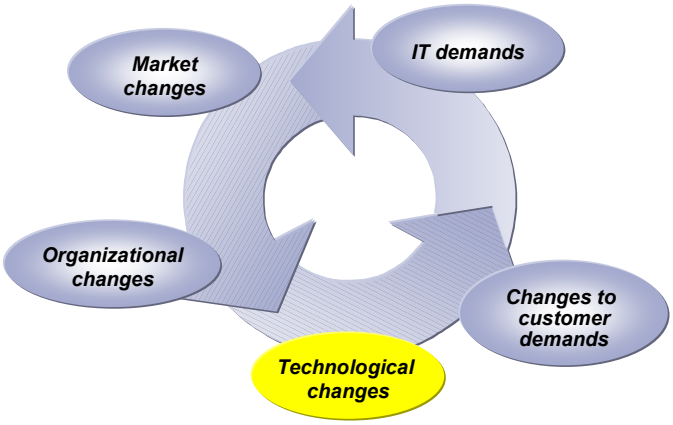
- With the recent move to a deregulated market, customers can now not only chose between energy providers but also between a wide range of rates, types of contracts, and levels of service. The price of energy has become a more important factor. Utilities must now record and analyze increasingly detailed information about the consumption and demand of their customers and be able to leverage information effectively.
- Business relationships are also more dynamic in a deregulated environment. Companies require a software solution that enables them to exchange vast amounts of data electronically.
- Deregulation has also given rise to new energy markets, such as the spot market, and new types of companies, such as suppliers and distributers. Individual market participants need information that is relevant for their business processes. They need a solution that can link processes that were previously bundled together within a single company.



- Distributors
  - Maintain meters and measure customer consumption on behalf of suppliers
  - Determine total load shape per supplier
  - Send customer consumption data to supplier, send supplier consumption data to transmission company
- Transmission System Operators (TSO)
  - Evaluate schedule to determine energy needed
  - Guarantee supply (power system balance)
  - Provide regulation energy to the grid
  - Determine imbalances between load schedule and actual load
  - Reconcile energy imbalances and determine financial credits or debits
- Suppliers
  - Acquire customers using marketing information and CRM
  - Manage risk
  - Bill customers for consumption, create load forecasts and send them to the TSO

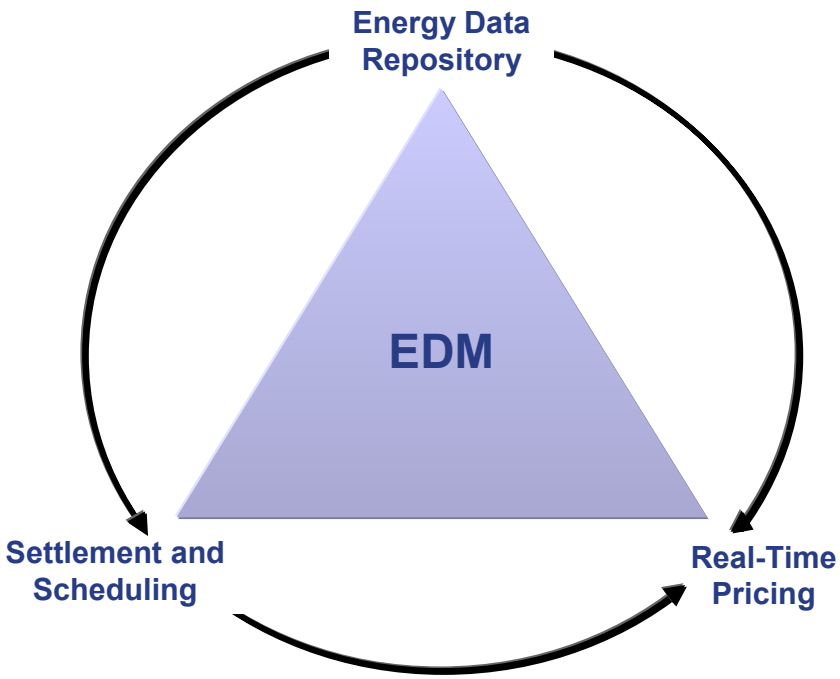
Technological Changes

- **Digital interval meters**
- **Remote meter reading**
- **Mass data processing**



- Technological changes
  - Digital interval meters
    - Measurement values are registered in intervals, such as 5/10/15/30/60 minutes
    - Meters are read locally via serial interface or infrared interface
  - Remote meter reading
    - Meters can also be read remotely by Automated Meter Reading (AMR) Systems
    - Methods of communicating with the meter are, for example, radio communications, telephone lines, power line carriers, and so on.
  - Mass data processing
    - A database is needed to store and consolidate data fromAMR systems and interval meters centrally

The Three Pillars of EDM



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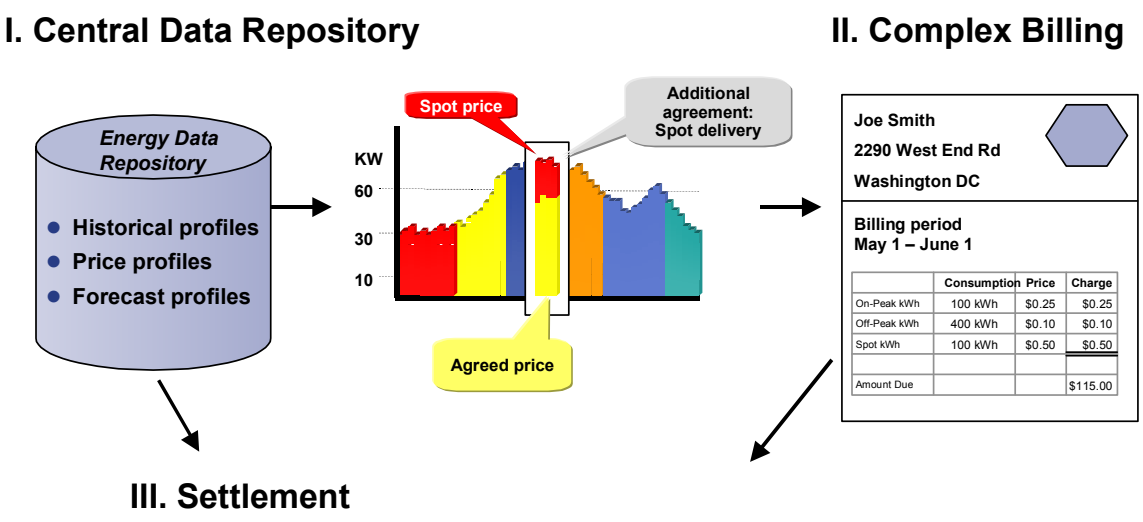
Target Objects of Energy Data Management



Energy feeding – Energy withdrawal = Balance deviation

- Central Data Repository
  - Stores all types of energy data in the central energy data repository
- Complex Billing
  - Enables billing of interval data such as real-time pricing and time of use pricing
- Settlement
  - Processes settlement runs, schedules, and load shapes

Introduction to EDM: Overview of Profiles

- The Need for EDM in the Marketplace
- Overview of Profiles
- Overview of Complex Billing

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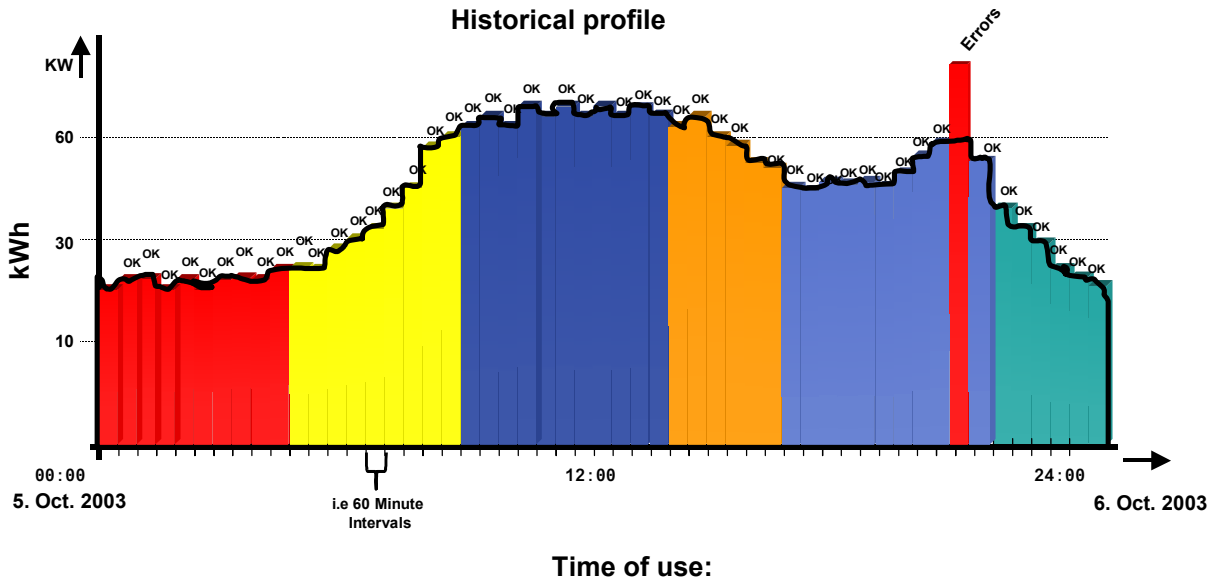
What is a Profile?



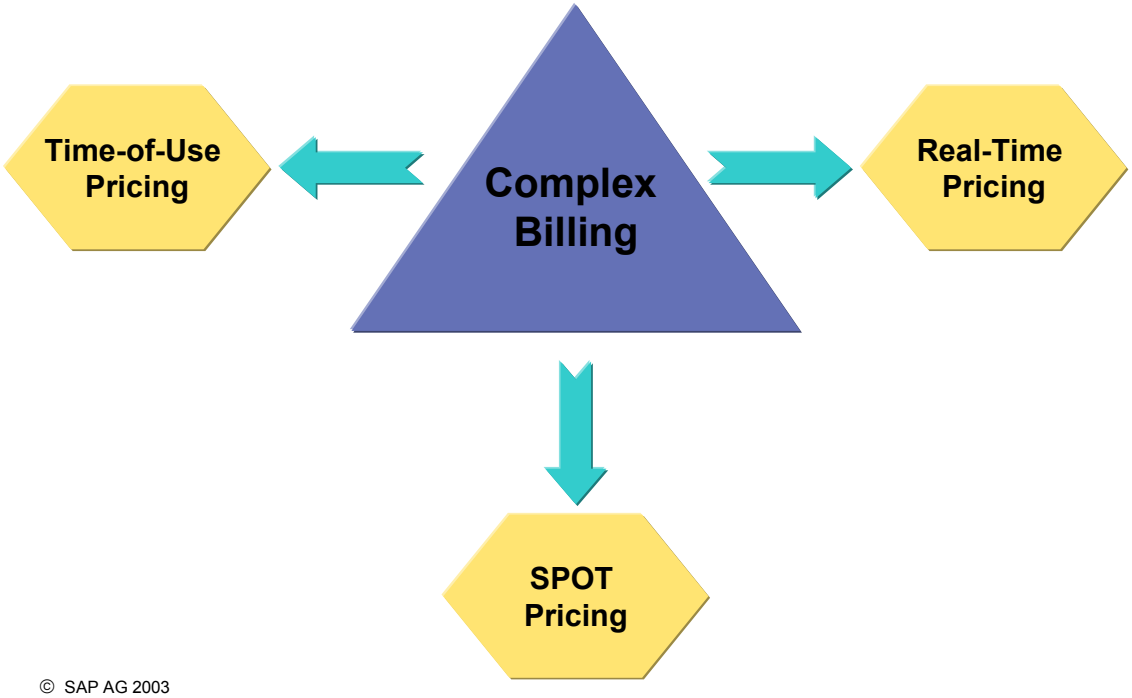
- What is a profile?
  - Contains values such as consumption and prices for a certain period
  - Within EDM, a profile is composed of header data and profile values
- Data stored within a profile
  - Historical data: Actual (measured) meter readings
  - Forecast data: Estimated energy consumption or forecast for a customer‘s future usage
  - Schedule data: Proposed energy to be consumed per supplier (aggregation of forecast and/or historical data)
  - Conversion factor profile (such as gas law deviation factor)
  - Rate/price/temperature time series
- Characteristics of a profile
  - Interval lengths (5 minutes, 10 minutes, 15 minutes, 30 minutes, 60 minutes)
  - Unit of measurement (kWh, kW, Price, Temperature, Factors, etc…)
- Examples of interval data include:
  - Values measured by an interval meter every 60 minutes
  - Forecast values for an interval meter every 60 minutes
  - A price index from the energy exchange with an hourly amount

Introduction to EDM: Overview of Complex Billing

- The Need for EDM in the Marketplace
- Overview of Profiles
- Overview of Complex Billing

What is Complex Billing?

- **Within IS-U-EDM, complex billing refers to one or more of the following pricing procedures:**



- The following 3 types of complex billing are referred to throughout this unit:
  - Time-of-use pricing
  - Real-time pricing
  - Spot pricing

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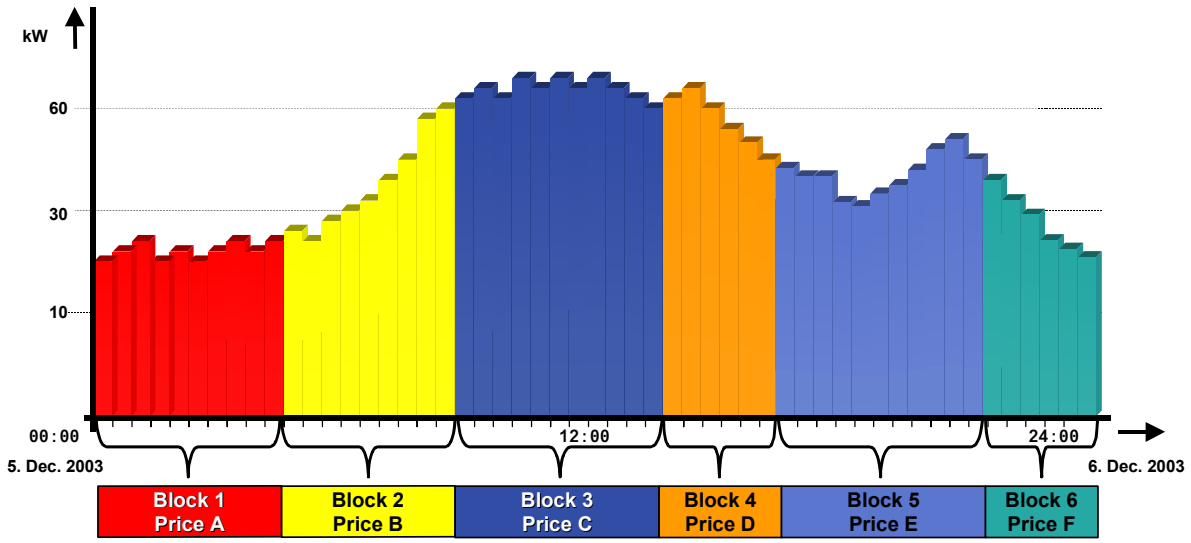
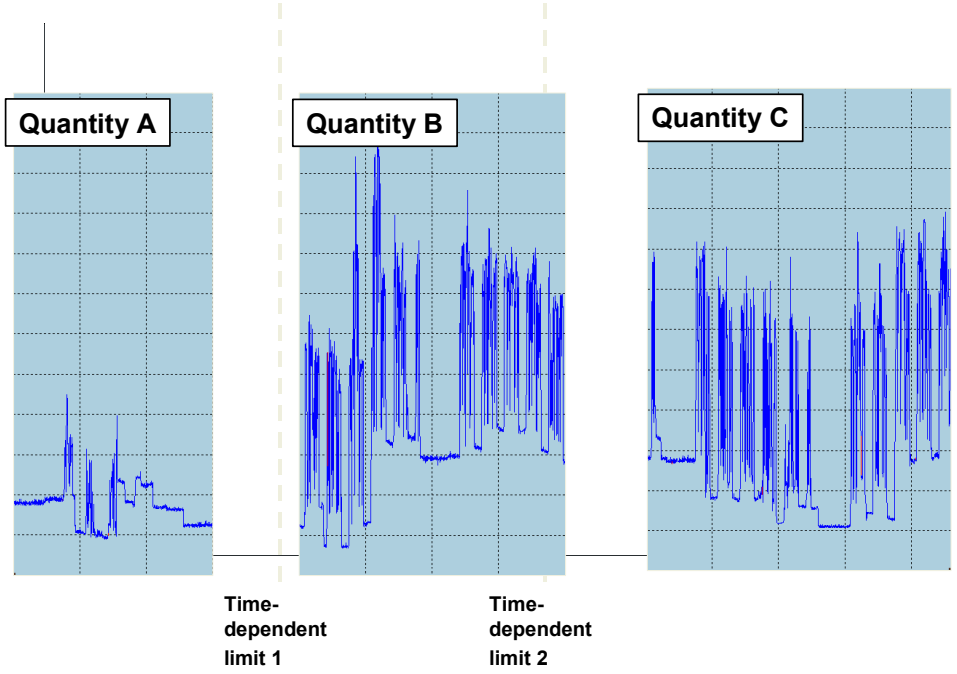
Time-of-Use Pricing



- The Time-of-use prices (TOU prices) for electricity are based on electricity costs during a particular period of time. TOU rates are, for example, divided into three time blocks per twenty-four hour period (on-peak, mid-peak, off-peak) and by seasons of the year (summer and winter).
- In a TOU rate structure, higher prices are charged during utility peak-load times. Such rates can provide an incentive for consumers to curb power use during peak times.
- RTP interface handles:
  - Determination of consumption blocks
  - Determination of peak values (i.e. maximum demand)
- TOU pricing is based on complex time-of-use rate structures which are dependent upon:
  - Seasons, i.e. summer/winter
  - Day types, i.e. working day, public holiday, weekend day
  - Time of the day, i.e. on/off-peak times
- Time-of-use:
  - Consumption aggregation in every period/time block
  - Price calculation for the quantities

TOU Billing



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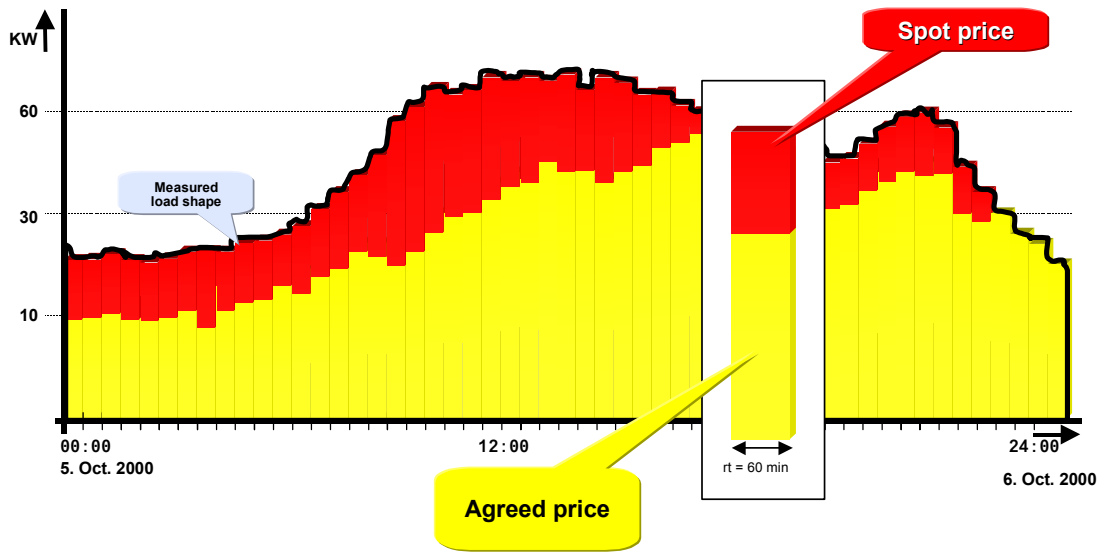
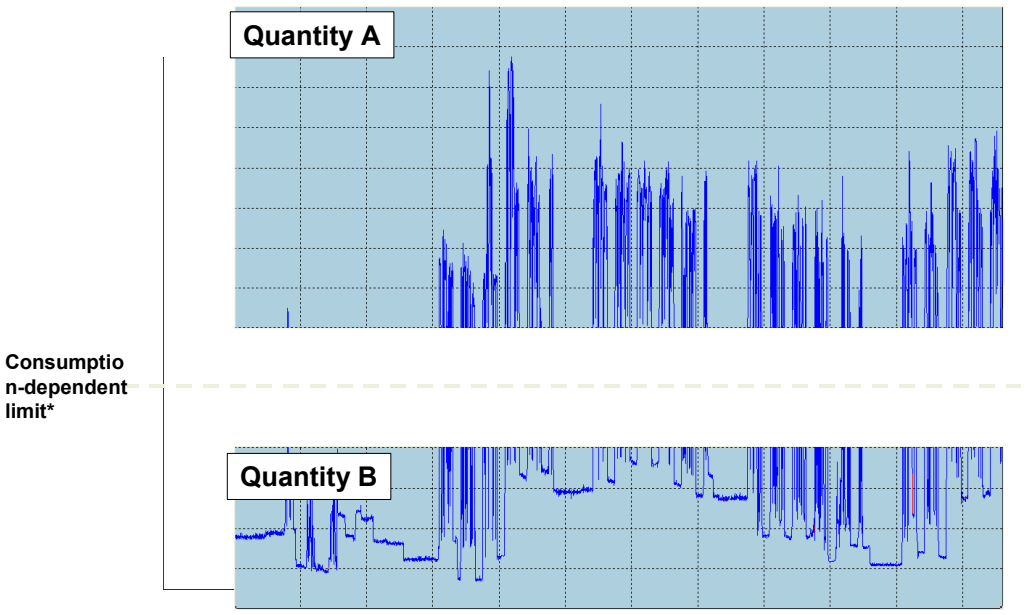
Real-Time Pricing



- Real-time pricing is the pricing of energy based on the cost of the energy available for use at the time that the customer demands it.
  - New deregulated energy market rules make prices volatile
  - Complex rate structures require the ability for prices to change at up to hourly intervals
- Real-time pricing:
  - Demand and consumption are amounts that are dependent on each other within each interval. Each interval is valuated separately
  - The price is subject to change, which, in extreme cases, can cause it to change in every interval

RTP Billing



*) Fixed value, profile, ...

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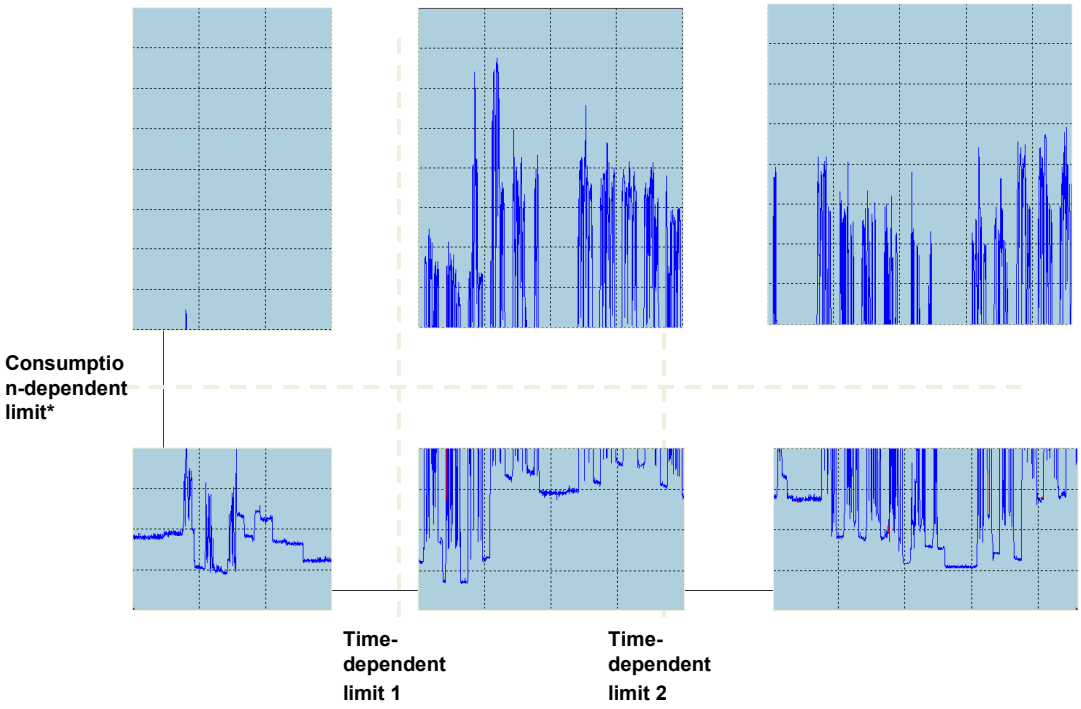
Combination of RTP and TOU Billing

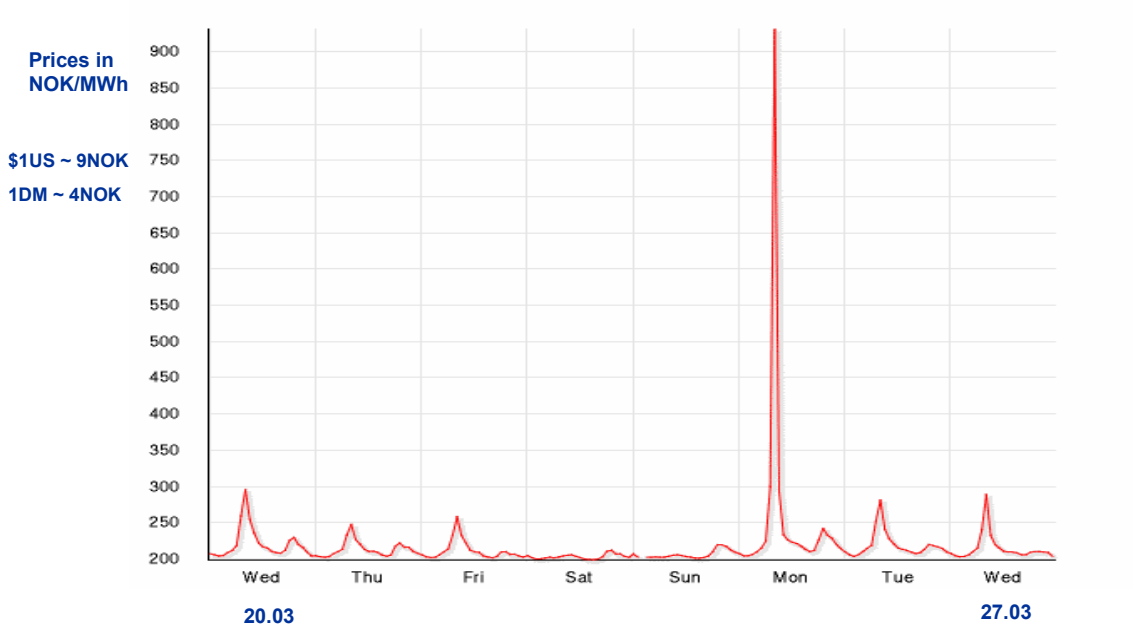


*) Fixed value, profile, ...

SPOT Pricing

NORD POOL
THE NORDIC POWER EXCHANGE
http://www.nordpool.com/index.html

- Elspot system price for service territory
- Prices shown for March 20 - 27, 2003



- The Elspot system price is the SPOT price of energy for the NORDPOOL power exchange.
- Spot Price: current market price at which short-term energy purchases or sales are made.
- In a REGULATED market, the price of energy is dependent on:
  - Energy consumption.
  - Demand
  - Voltage, pressure or additional services
- In a DEREGULATED market, the price of energy is dependent on:
  - Consumption patterns over time
  - Accurate forecasting
    - Energy price is dependent on customer's willingness to take price risks ("Hedging")
- Energy price is the result of consumption, demand, consumption patterns over time, hedging the price risk, ...

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EDM Functional Overview: Unit Contents

- Functional Overview of the Energy Data Repository
- Profile Data Exchange Within a Deregulated Energy Market
- Integration of the Energy Data Repository with IS-U/CCS

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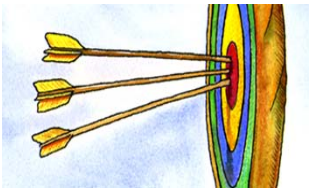
EDM Functional Overview: Unit Objectives

At the conclusion of this unit, you will be able to:

- **Describe the functions of the Energy Data Repository**
- **Describe the integration of electronic data exchange with the Energy Data Repository**
- **Explain the integration of IS-U/CCS and EDM.**



EDM Functional Overview: Functional Overview of the Energy Data Repository

- Functional Overview of the Energy Data Repository
- Profile Data Exchange Within a Deregulated Energy Market
- Integration of EDM and IS-U/CCS

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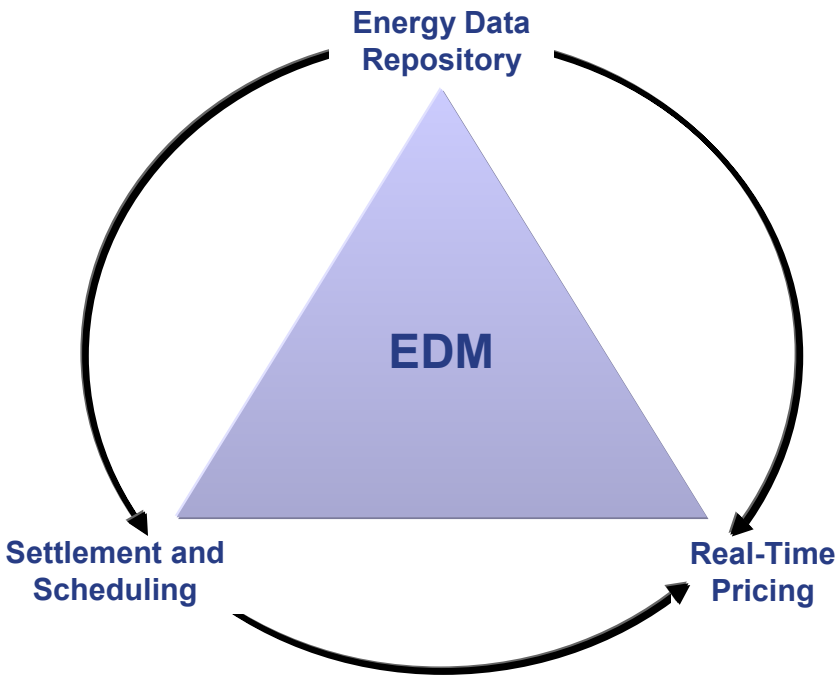
The Three Pillars of EDM



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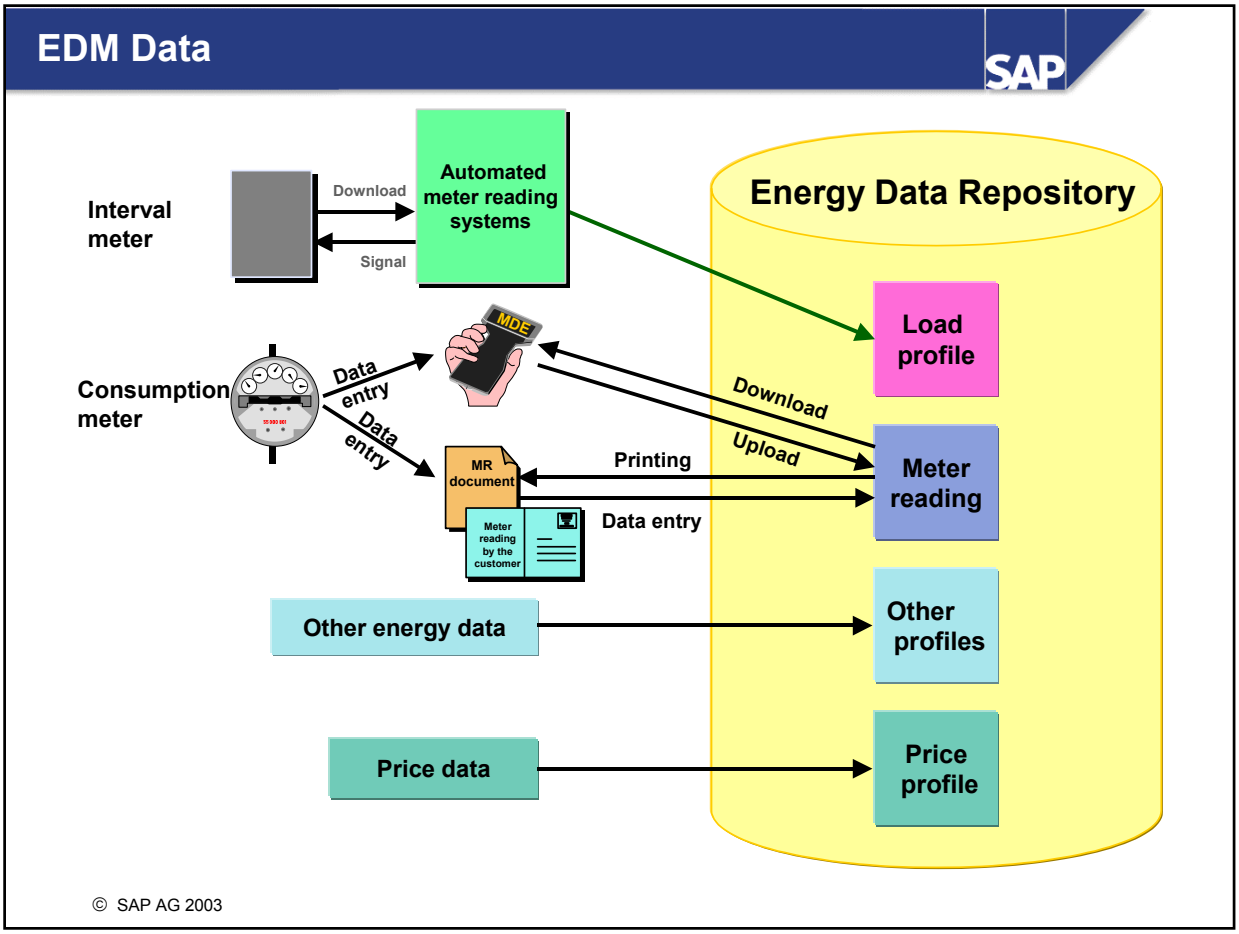

- **The Energy Data Repository is the central storage database for ALL energy related data needed within a utility company, such as prices, weather, conversion factors, and so on.**

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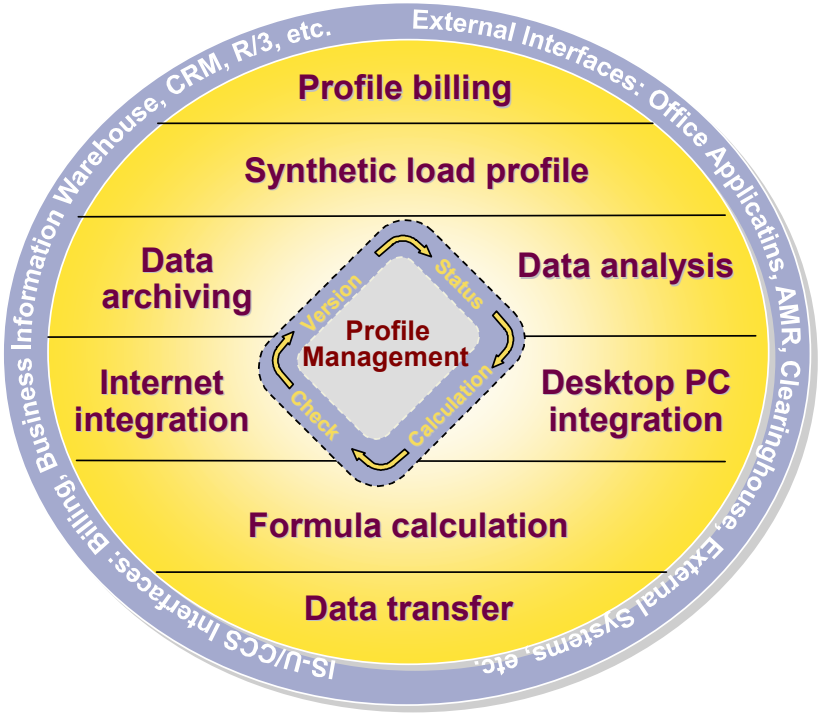
Profile Management Overview



- The above diagram gives an overview of Profile Management.
  - The central element is the profile which can store measured values, prices, and other data.

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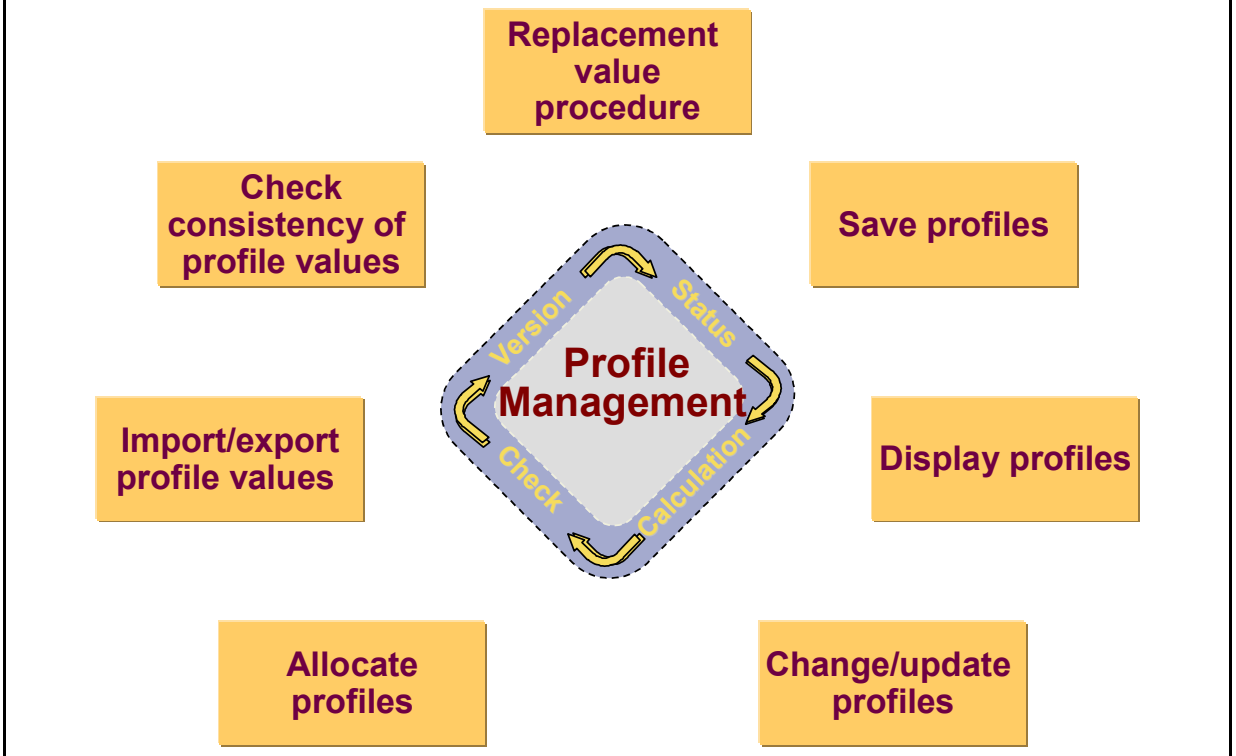
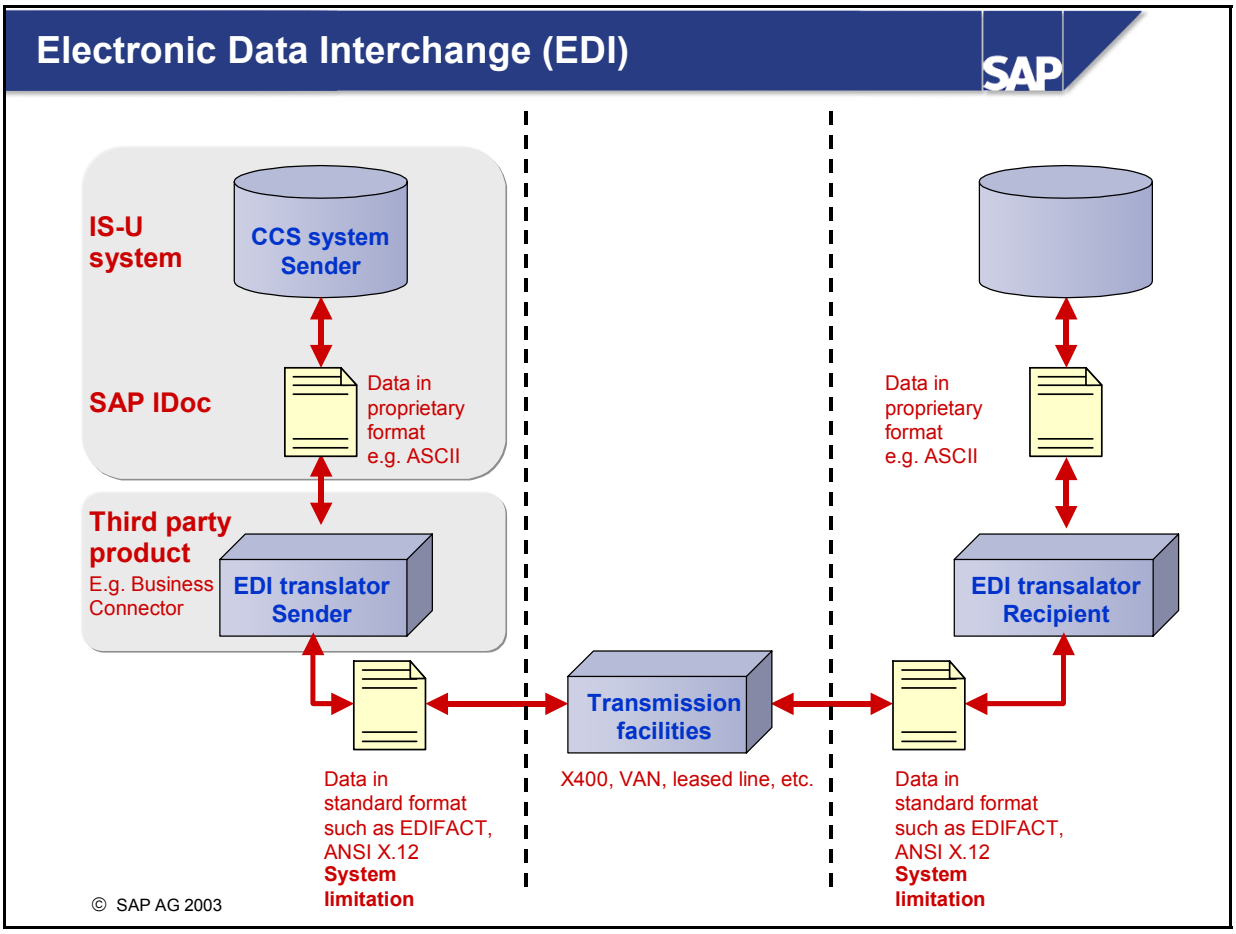
Profile Management Elements



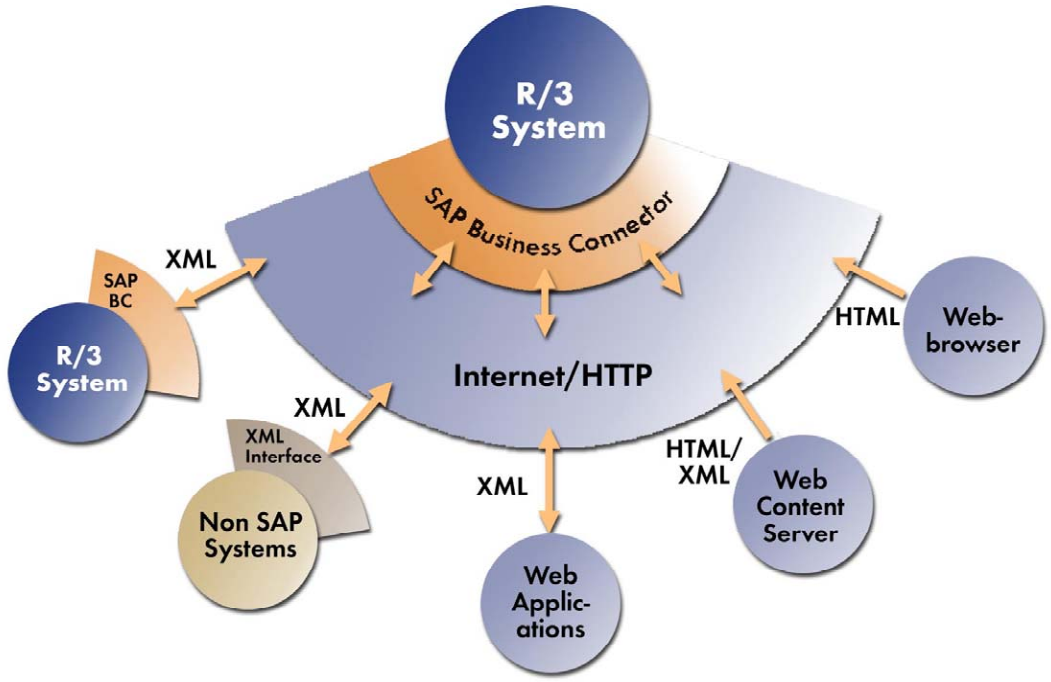
- **Save profiles**
  - Time basis, interval length
  - Optimized data storage and queries
- **Display profiles**
  - In table format
  - In graphics
  - Via OLE interfaces to the local PC
- **Change and update profiles**
  - Status monitoring (valid, invalid, manually changed, estimated, and so on)
  - Logging and versioning of changes
  - Automatic estimation and manual creation of schedules
  - Via OLE interfaces to the local PC
- **Import/export profiles**
  - From MDE or automated meter reading systems (via BAPI standard interfaces)
  - From third parties via data exchange, such as EDI (IS-U/IDE)
  - Import profile values via BAPIs; IDocs
- **Allocate profiles**
  - Via point of delivery ID
- **Check consistency of profiles**
  - Consistency checks defined by the enterprise (for example, extreme values, missing values, overlapping)
- **Determine replacement values**
  - Determination of values during profile value import using the replacement value procedure

EDM Functional Overview: Profile Data Exchange Within a Deregulated Energy Market

- Functional Overview of the Energy Data Repository
- **Profile Data Exchange Within a Deregulated Energy Market**
- Integration of EDM and IS-U/CCS



XML Data Exchange



EDM Functional Overview: Integration of EDM and IS-U/CCS

- EDM Functional Overview
- Profile Data Exchange Within a Deregulated Energy Market
- Integration of EDM and IS-U/CCS

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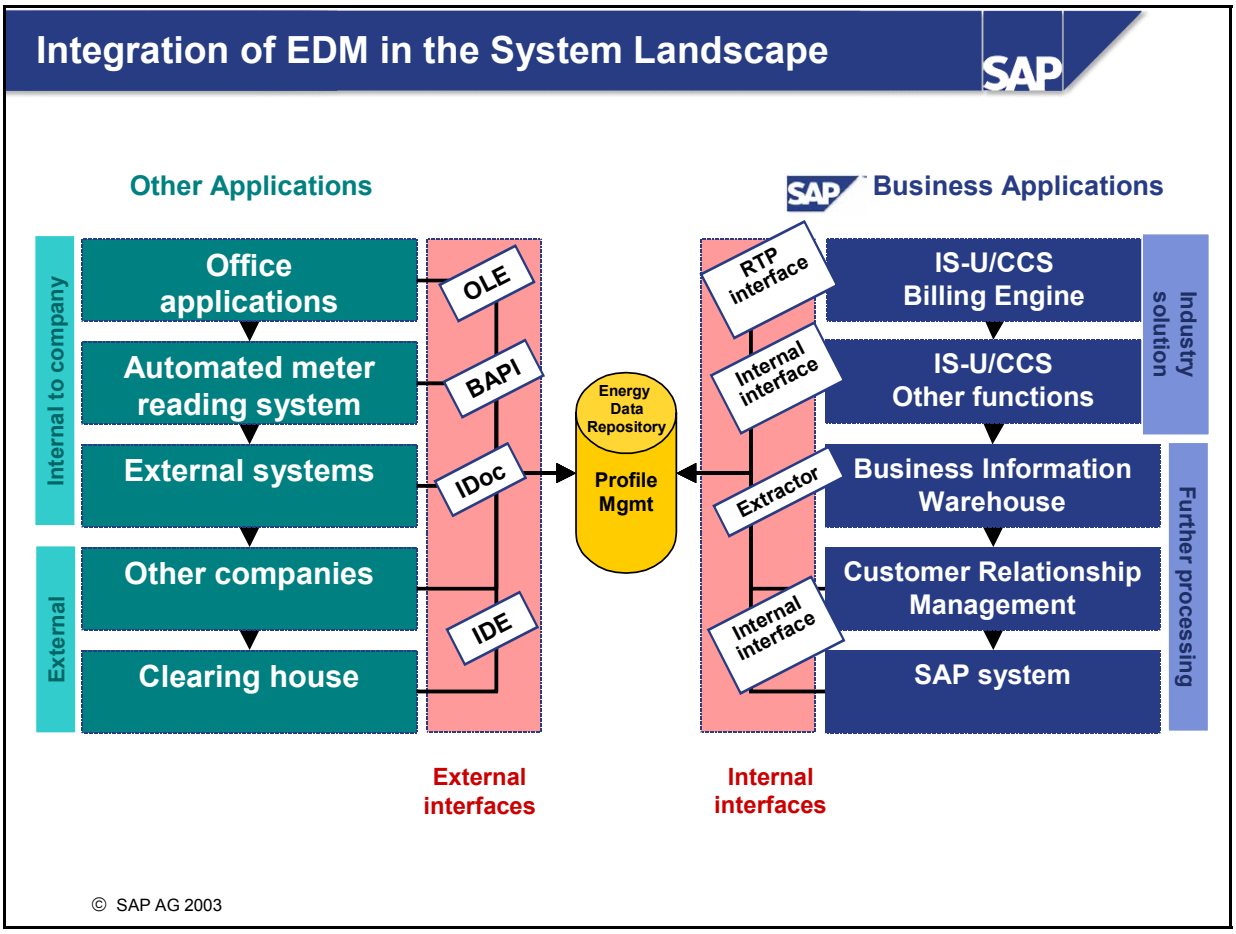

- EDM is a fully integrated component of IS-U/CCS. That means you can manage all energy data imported from both internal and external enterprises, such as load shapes and profiles, for individual points of delivery in one central database. Energy data can be stored and displayed in a variety of formats and layouts. The data can be validated before processing and exporting it to other components, such as billing.
- Energy data can be imported to the EDM Repository from Office Applications such as Excel via OLE interface, from AMR systems via BAPIs, from other external systmes via IDocs, and from the Clearing house and other external systems via IDE.
- Once the data has been imported, it is managed within EDM in the form of profiles.
- The profile information can be passed to IS-U/CCS Billing via the internal RTP-Interface (which will be detailed in IUT235). Other IS-U/CCS modules, such as Device Management, Contract A/R and A/P, Scheduling, and others, are exported via an internal interface. In the same way, profile data can be sent to Customer Relationship Management (CRM) systems and used in customer analyses, marketing campaigns, and so on.
- An extractor will be used to transfer information to the Business Information Warehouse.

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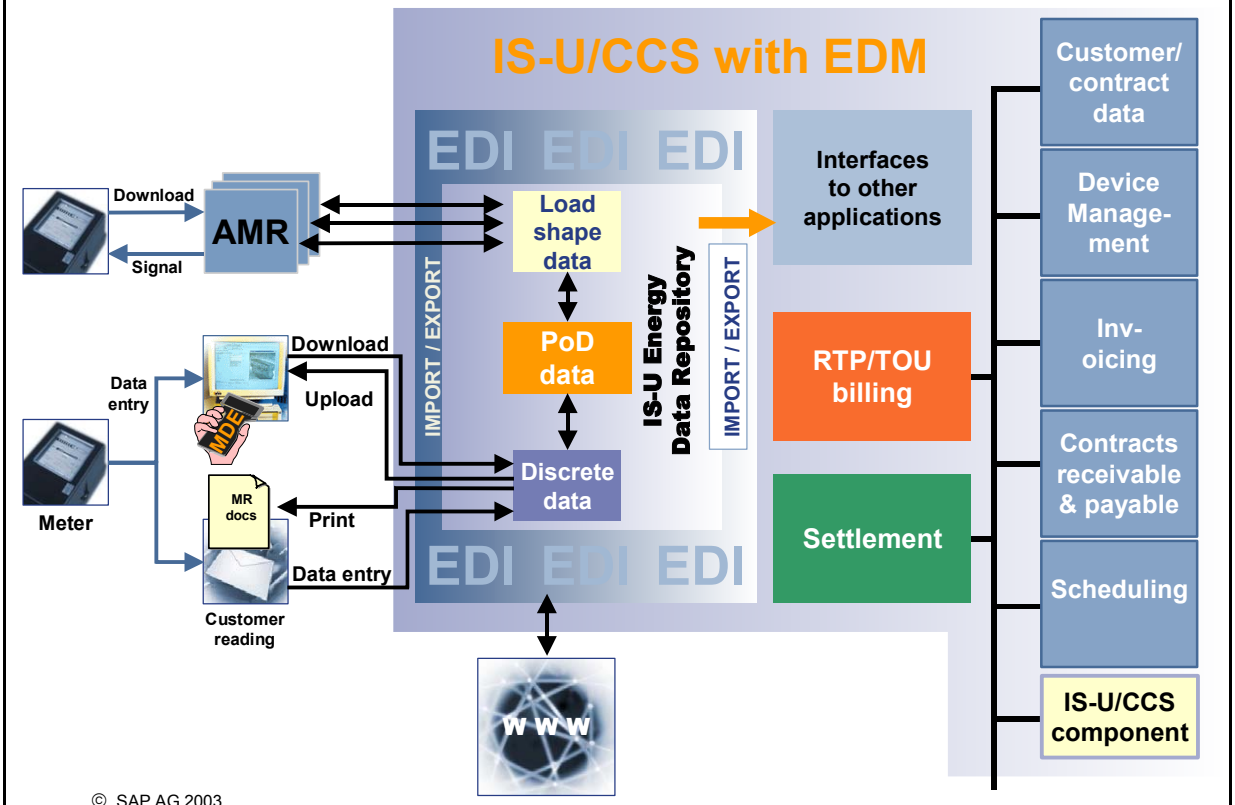
Integration of the Energy Data Repository in IS-U/CCS



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EDM Relevant Data Objects: Unit Contents

- Data Model Enhancements
- Point of Delivery (PoD)
- New Fields in Device Management

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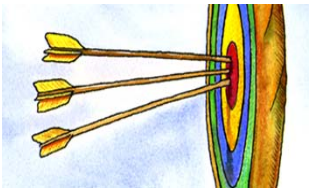
EDM Relevant Data Objects: Unit Objectives

At the conclusion of this unit, you will be able to:

- **Recognize the New Data Model.**
- **Define Point of Delivery.**
- **Describe the various PoD elements.**
- **Explain the different PoD types and roles.**
- **Identify PoD customization settings.**



EDM-Relevant Data Objects: Data Model Enhancements

- Data Model Enhancements
- Point of Delivery (PoD)
- New Fields in Device Management

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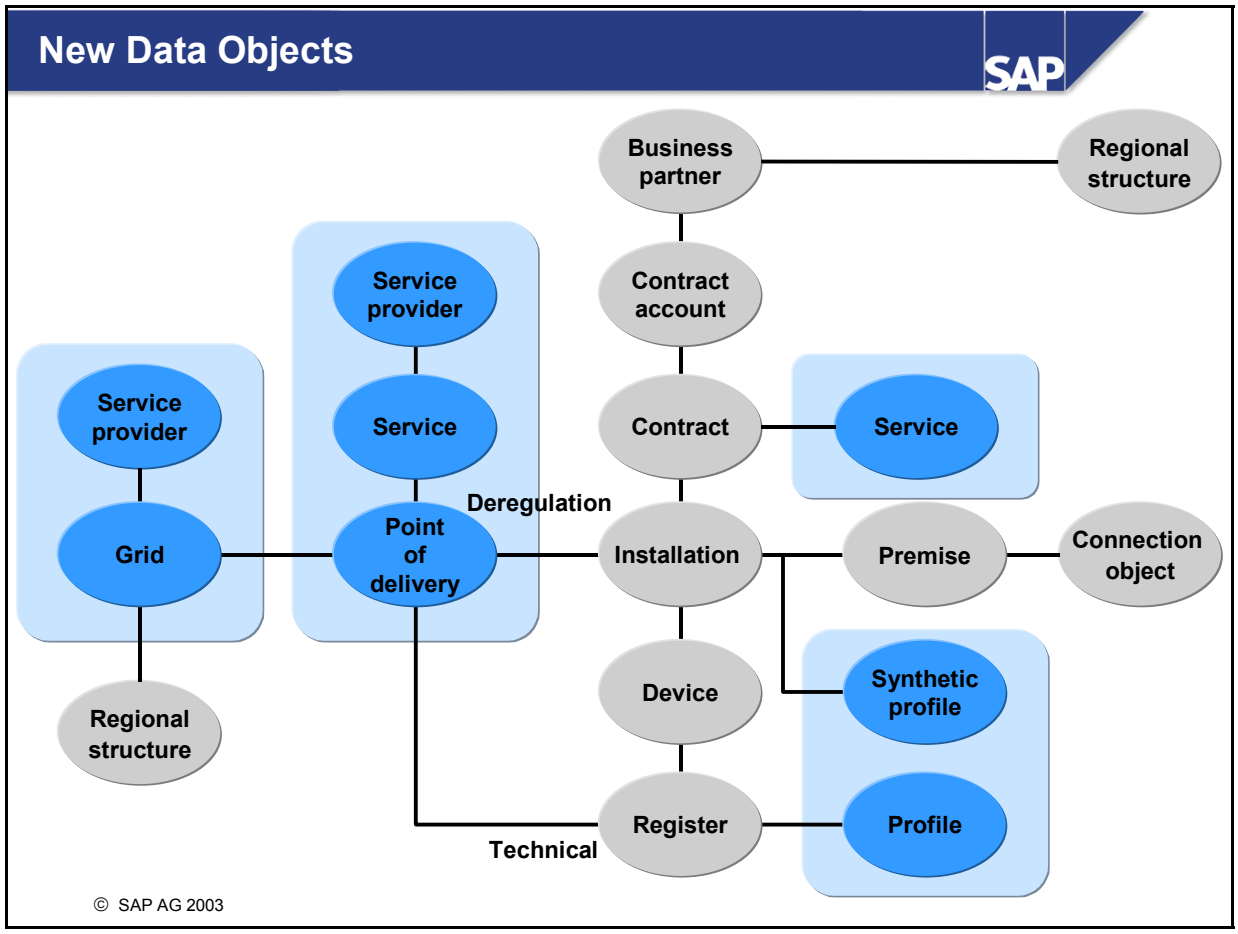
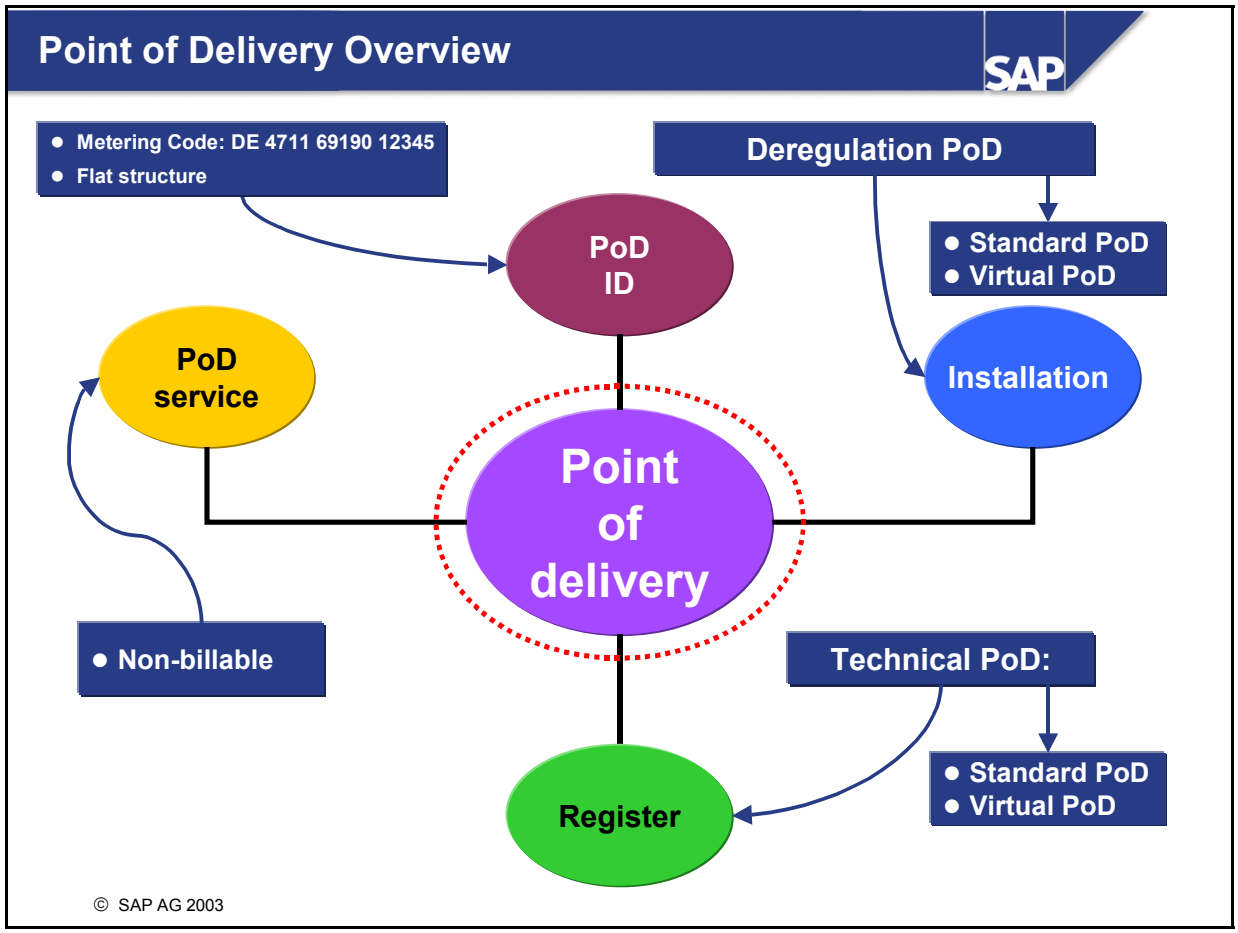


- There are five new data objects in the data model as shown above:
- **Point of delivery:** Point to which a utility service is supplied or for which a utility service can be determined. A point of delivery has one external identifier, a unique number or fixed code, called a Point of Delivery ID (will be covered in detail in this unit).
  - A point of delivery serves two roles:
    - Electronic data communication during automatic data exchange (deregulation role)
    - Exchange of measurements (technical role)
  - At one PoD there may be many services attached.
- **Service**: A service that is rendered by a service provider at a point of delivery.
  - Note: A PoD services is non-billable. A contract is a billable service.
- **Service Provider**: Company providing a service to a PoD.
- **Profile**: Time series data that contains values such as consumption or prices for a certain period.
- **Synthetic Profile:** Profile containing values generated on the basis of predefined periods (defined by day and day groups) and corresponding day and annual profiles. Synthetic profiles are used for classifying customers and customer groups. (See Unit: Synthetic Profile)
- **All data objects are discussed in greater detail throughout the training.**

EDM-Relevant Data Objects: Point of Delivery

- Data Model Enhancements
- Point of Delivery (PoD)
- New Fields in Device Management



The point of delivery is linked with the following objects:

- Point of Delivery Identification
- Deregulation point of delivery:
  - Standard point of delivery
  - Virtual point of delivery
- Technical point of delivery
  - Standard point of delivery
  - Virtual point of delivery
- Point of delivery service
  - Non-billable services

All of the elements will be covered in detail throughout this unit.

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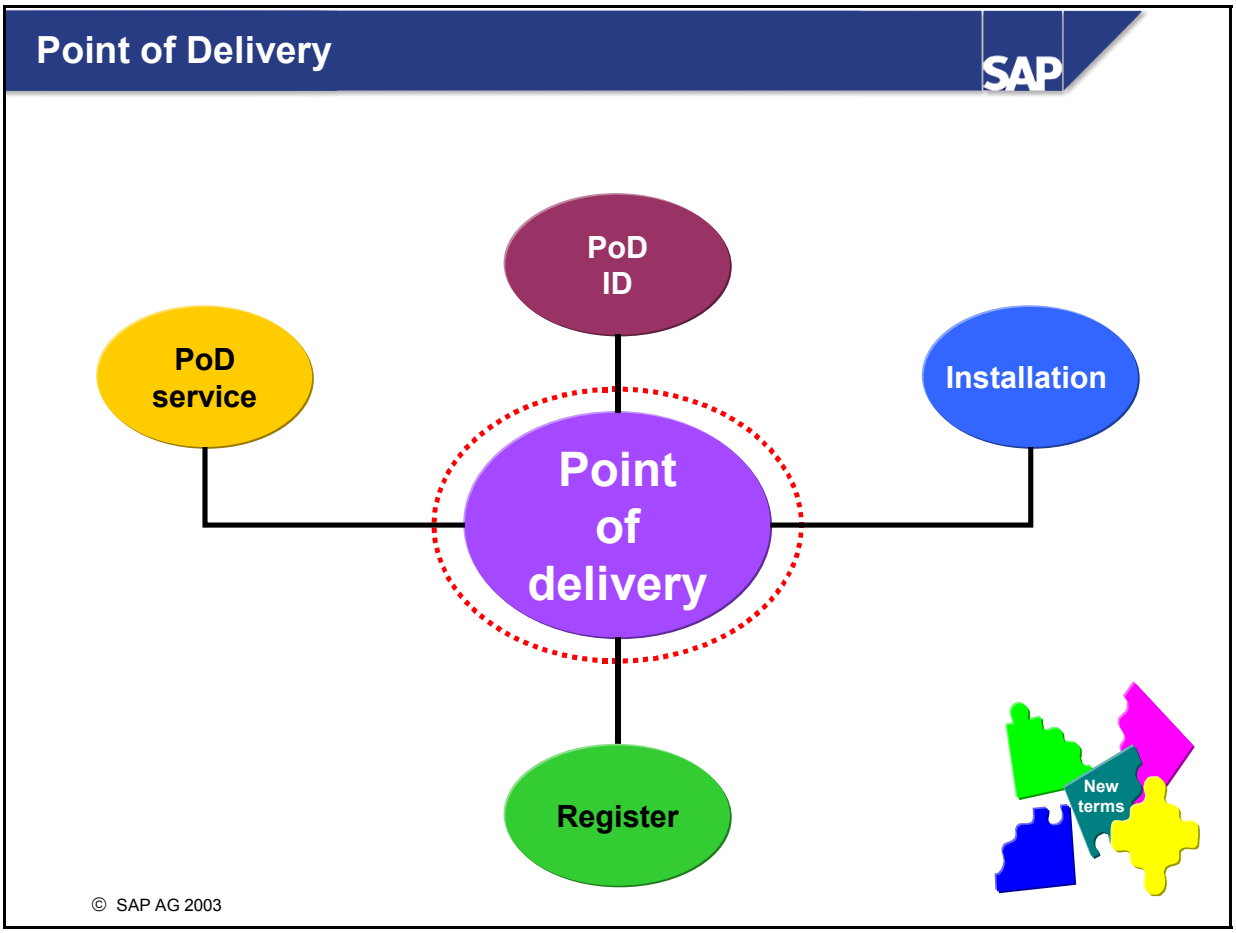

- **Point of Delivery (PoD):**
  - Point to which a utility service is supplied or for which a utility service can be determined.
  - Has one external identifier, a unique number or fixed code, called a point of delivery identification.
  - A point of delivery serves two roles:
    - Electronic data communication during automatic data exchange (Deregulation PoD)
    - Exchange of measurements (Technical PoD)
  - At one PoD there may be many (non-billable) services attached.
- **Examples of PoDs Include:**
  - Point from a generation facility to transmission grid
  - Interchange point from a control area's transmission grid into another control area's transmission grid
  - Any intermediate measuring point (i.e. a transformer)
  - Point into a customers installation (premise)

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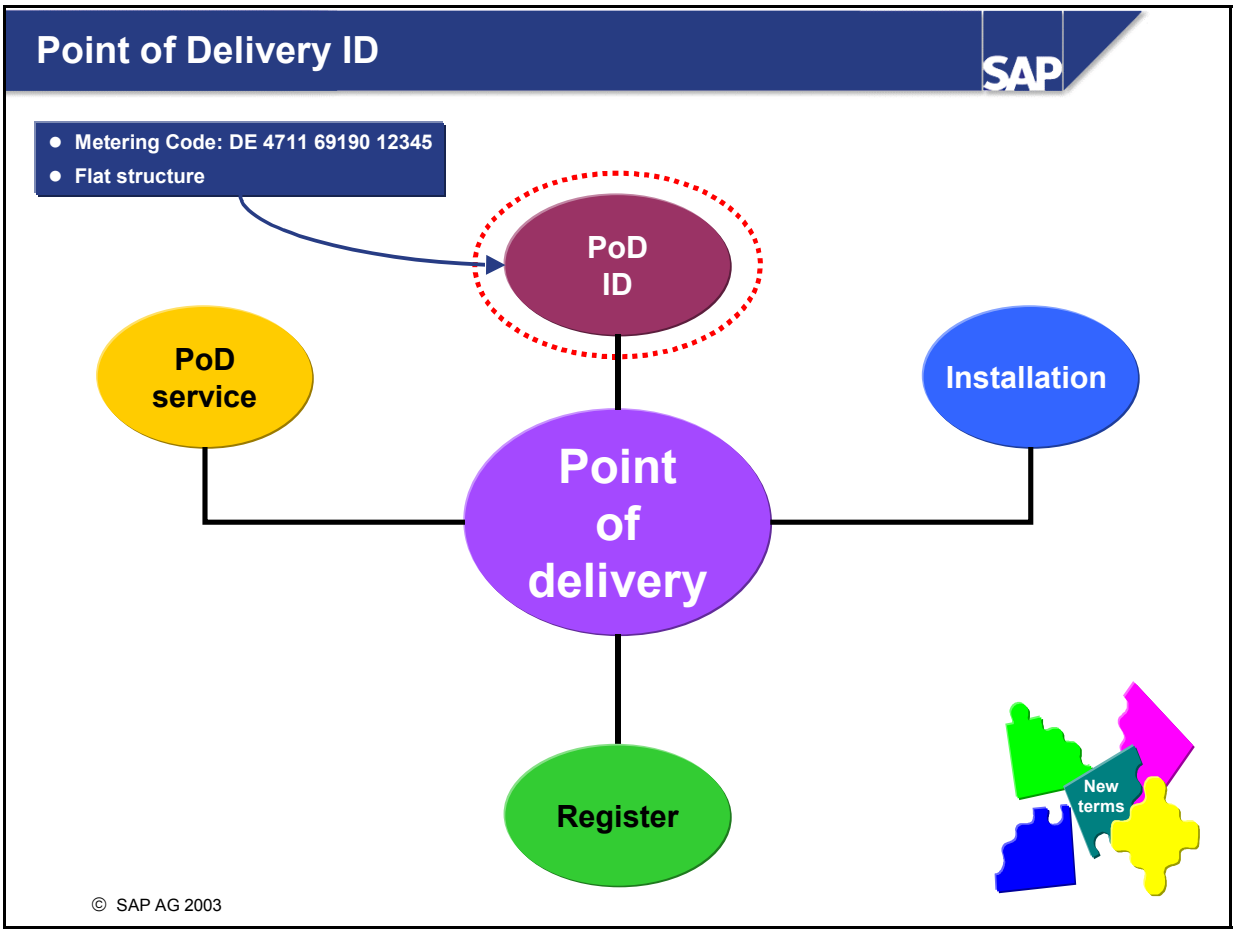
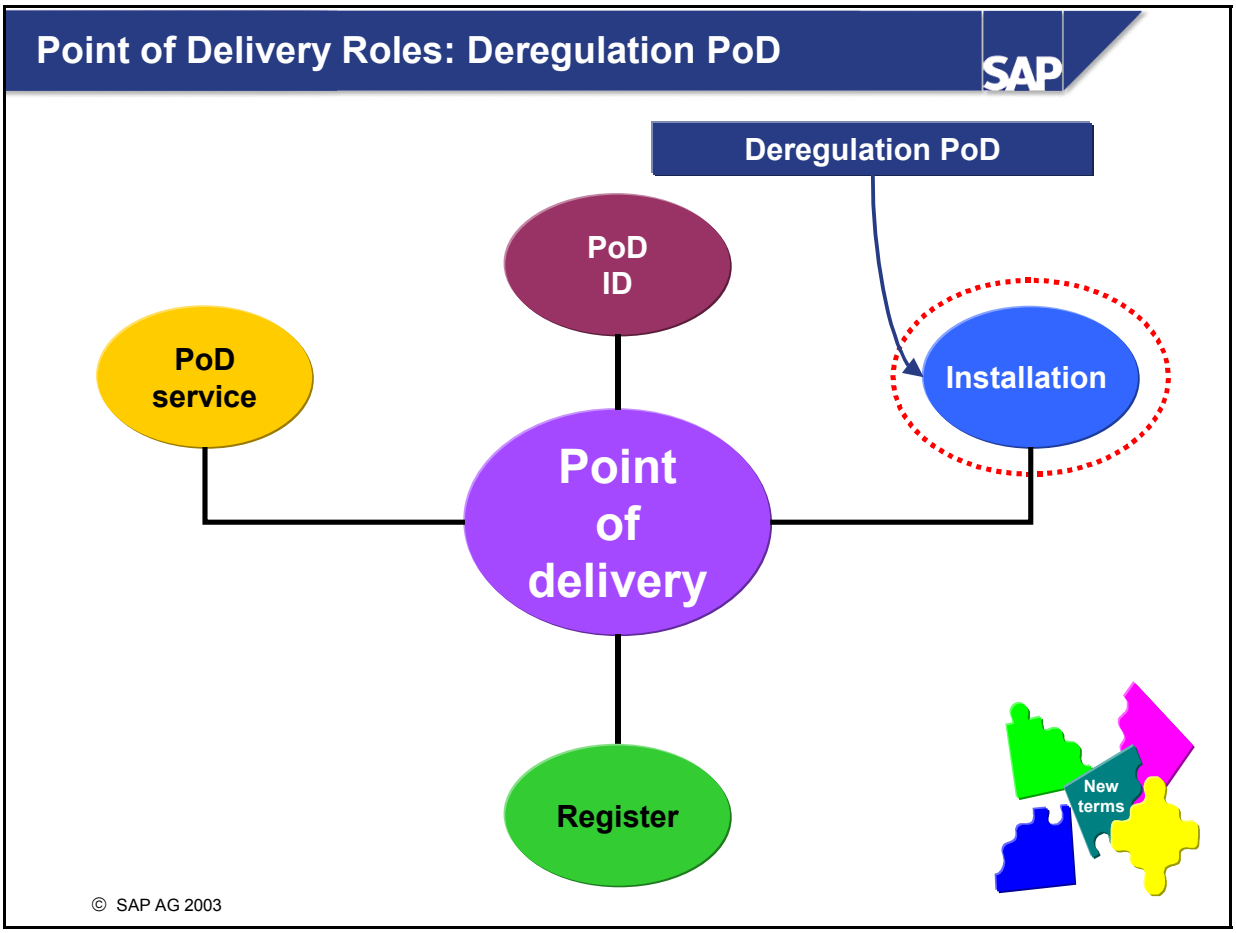


Point of Delivery ID:

- A unique number or fixed code used to communicate with external systems.
  - The PoD itself, is a unique number created in the system (back office) and the PoD ID is assigned to that number.
- This ID ensures that discrepancies and incorrect allocations of registered data are avoided, with regard to the provisioning of information using the utility service determined at a point of delivery, or with regard to a change of energy supplier.
  - If the customer changes utility company, the number stays the same. This ensures that data remains constant
- Structure type *Metering Code* is valid in Germany
  - Other structure types may be customized/defined.
  - Note: The structure type is stored historically and may change over time.



There are two PoD Roles.

The first role is the:

- **Deregulation PoD**
  - Automatically generated when an installation is created.
  - Can be allocated to multiple installations
  - Note: Installations must belong to the same division category (i.e. gas, water, electricity, etc.)
  - Can be identified using a PoD ID.
  - Used for communication purposes between different utility companies in a deregulated market.

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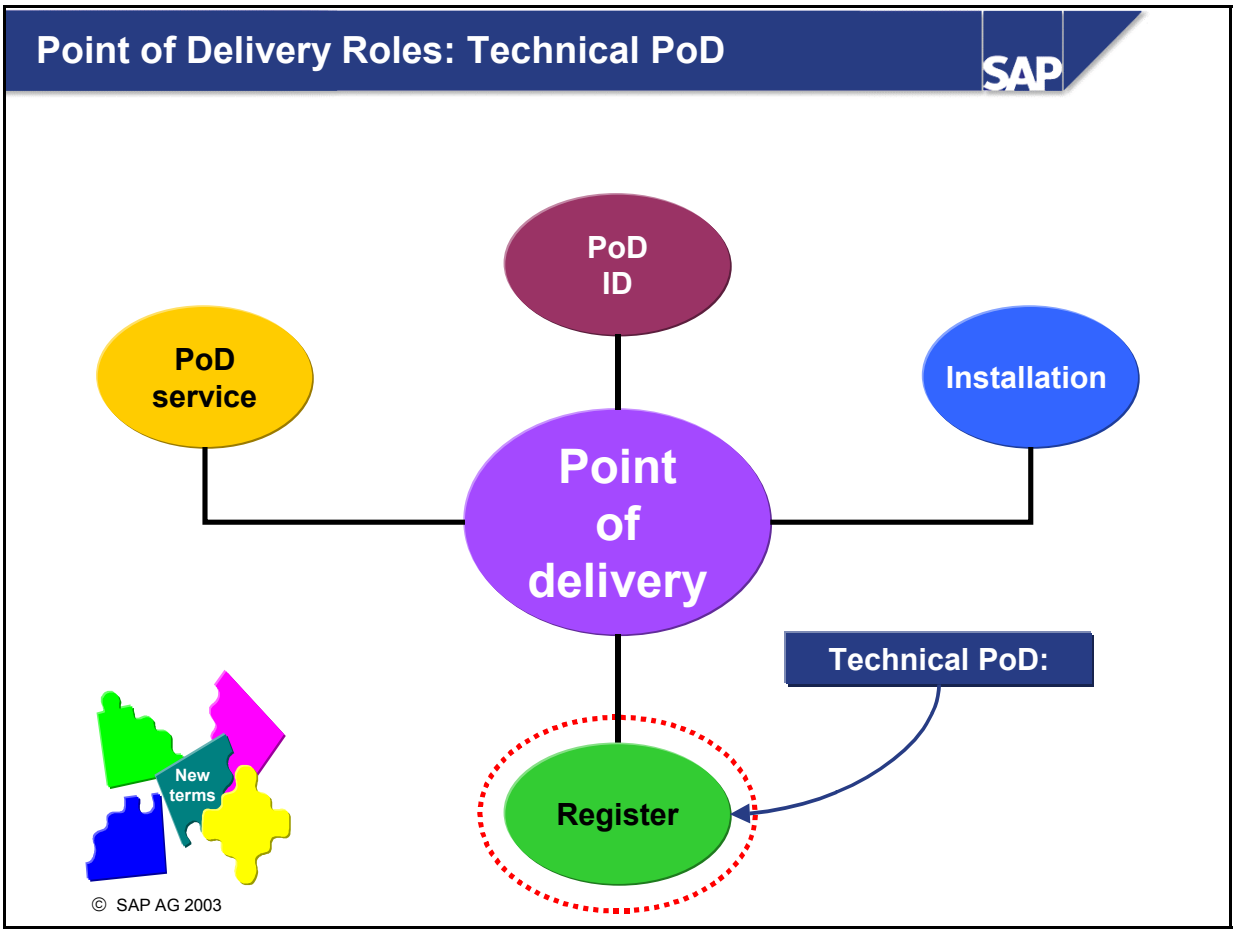

The second role is the:

- **Technical PoD**
- Is used in the following cases:
  - You need the point of delivery for technical communication with systems that do not use the usual point of delivery ID on the market.
  - You need the point of delivery for technical communication with systems whose measuring system does not correspond to market requirements. For example, if a device measures several points of delivery.

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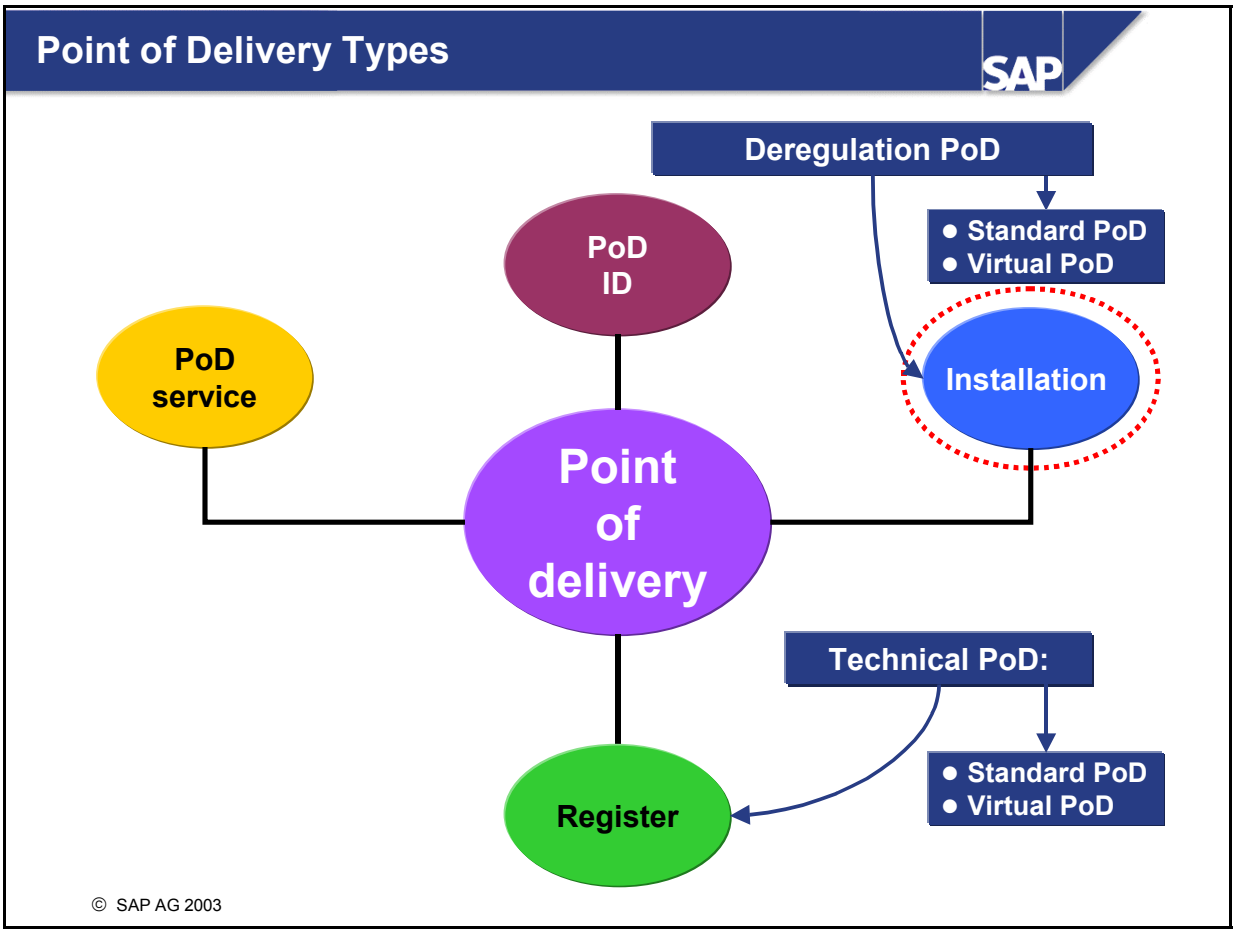

There are two types of PoD:

- **Standard point of delivery**
  - A PoD with a physical representation in the energy network.
  - Allocated at register level.
- **Virtual point of delivery**
  - Represents a PoD that summarizes or aggregates energy data.
  - Allocated at installation level.
  - Groups together several standard point of delivery categories.

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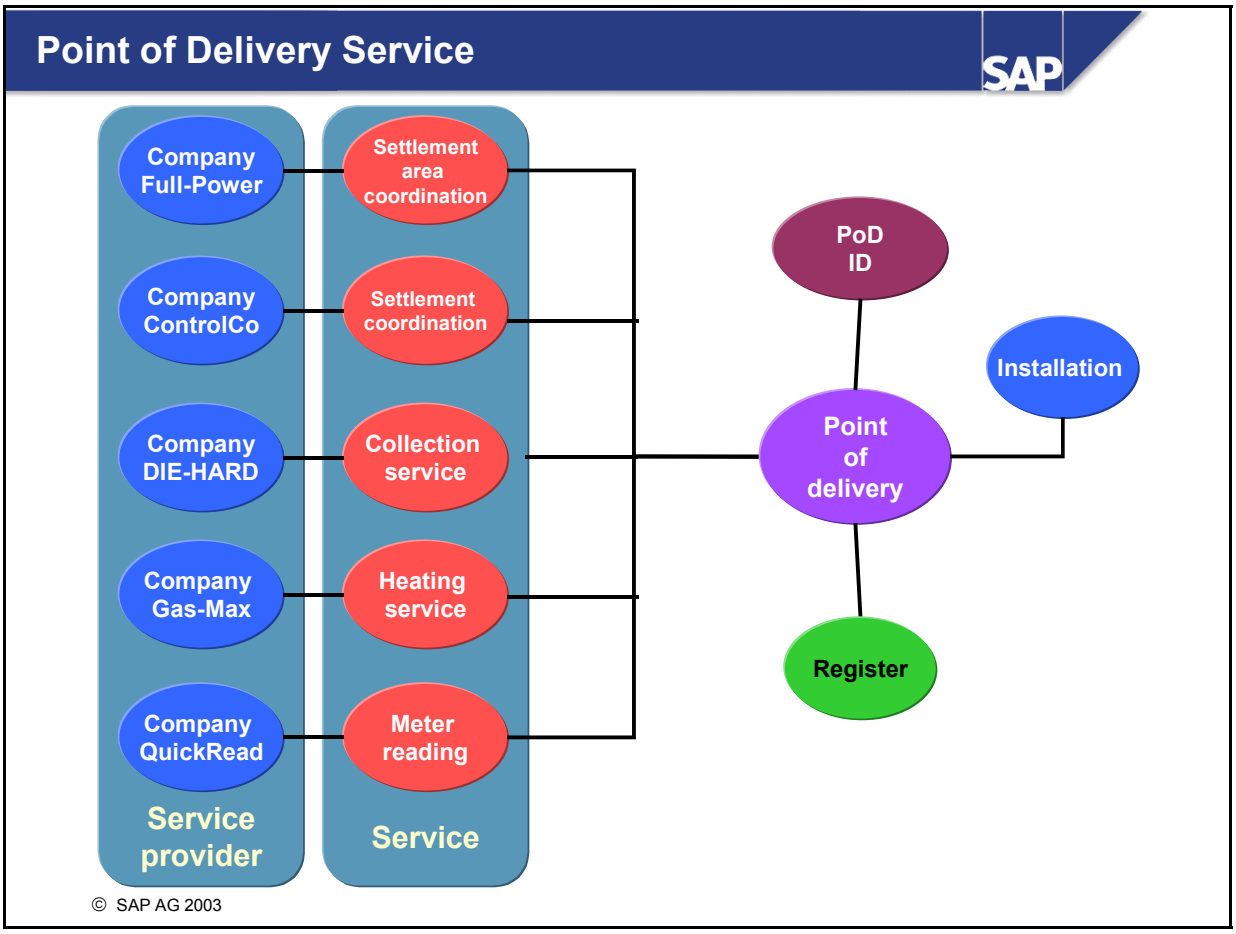
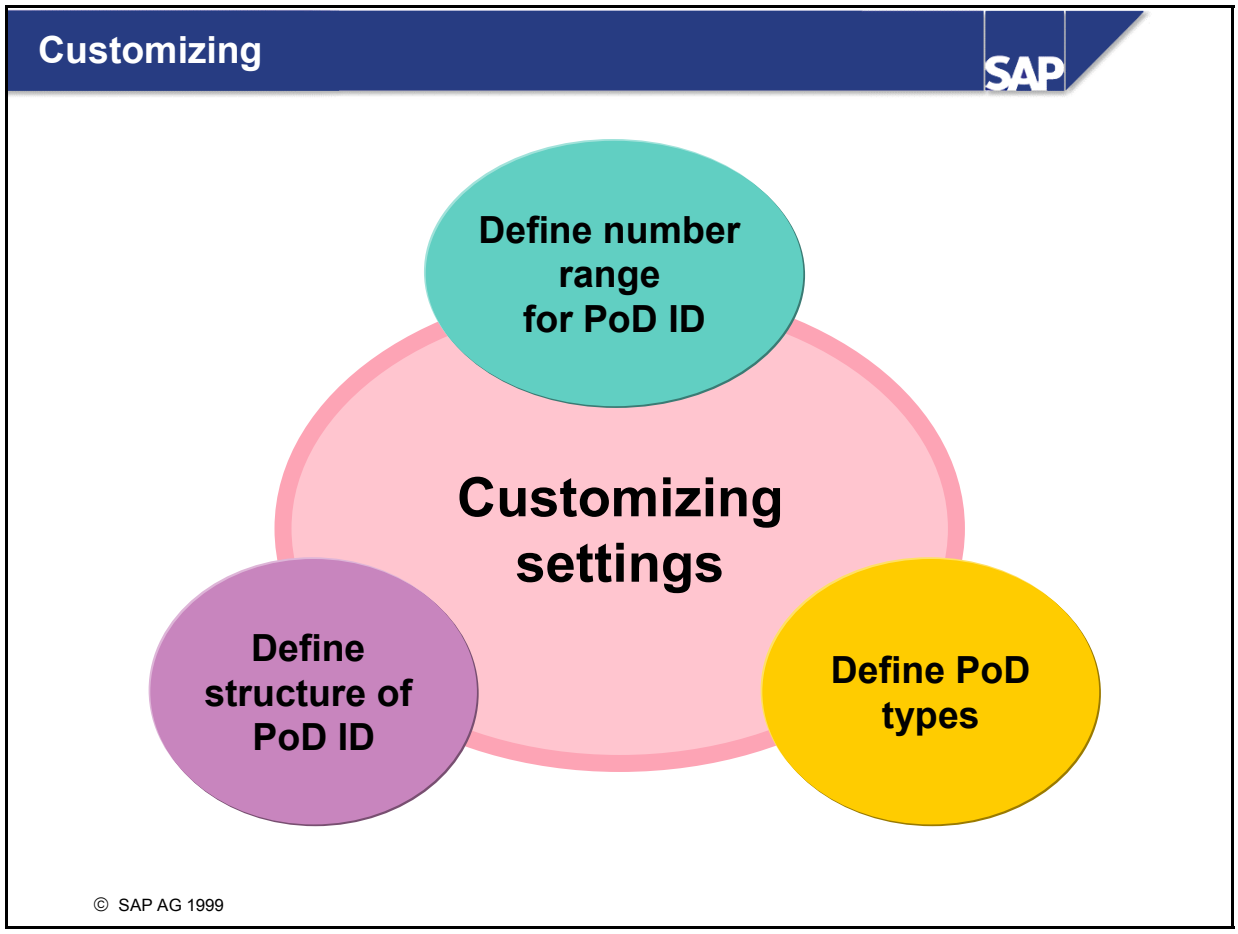


Point of Delivery Service

- A service that is rendered by a service provider at a point of delivery.
- A PoD service is a **non-billable service** used only for information purposes.
  - For example, meter reading
- Note: A billable service corresponds to a contract.
- All services are allocated to a service type and a service provider.
  - This also enables you to determine whether a *proprietary* or *third party* service is used.
  - Services are division-independent
- Services can be allocated using the move-in/out process as well as through a manual transaction and are historically prorated.



Customizing Settings:

- **Define PoD Types**
  - Standard and Virtual
  - Define PoD types and allocate to predefined categories
- **Define Structure of PoD ID**
  - Adjust and enhance structure type
  - Define new structure type
- **Define number ranges for PoD ID**

  Customizing path: *SAP Utilities -> Master Data -> PoD*

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EDM-Relevant Data Objects: New Fields in Device Management

- Data Model Enhancements
- Point of Delivery
- New Fields in Device Management

New Fields in Device Management

- **Register Group**
  - **New Fields:**
    Interval lengths, billing unit of measurement
  - **Requirements:**
    The register code is used to identify the measurement task
    The EDIS key figure, for example, can be entered

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Exercises

Unit: EDM-Relevant Data Objects

Topic: Getting to Know the Data Model

- Find and describe the EDM-relevant data for a business partner.
- Explain the point of delivery and its characteristics.

The company DisCo wants to manage interval meters in IS-U. The relevant data objects, such as device type, must be described and defined beforehand. Additional data must also be added to the master data model.

1-1 Master data has already been created for business partner ***TP0101A0##*** (## represents your group number). Display an overview of your contract partner's key master data. In order to answer the following questions, choose *Utilities → Front-Office/Customer Interaction Center → Customer Interaction Center* from the SAP menu.

1-1-1 Identify business partner ***TP0101A0##*** and display the customer environment.

_____

1-1-2 Display the installed device. Which device category, basic device category, and register group are allocated to this meter?

Data Type	**Value**
Device category	
Basic device category	
Register group	

1-1-3 Branch to the detailed display of the *Register group*. What is the register code?

_____

Data Type	Value
Register code	

What important function does this field perform?

_____

_____

_____

1-1-4 What does the *Interval Length* field do and which values are permissible for this field?

_____

_____

_____

_____

_____

What dependency is created when you enter a permissible value in this field?

_____

_____

Return to the *Customer Interaction Center*.

1-2 In addition to the classical technical master data such as connection object and installation, the point of delivery fulfils an important task. You are in the *Customer Interaction Center*.

1-2-1 Display the point of delivery for business partner *TP0101A0##.*

1-2-2 What are the two possible roles of the point of delivery?

Role 1	
Role 2	

What is the difference between these roles?

_____

_____

Which role does your business partner's point of delivery have?

_____

_____

Can a point of delivery be allocated to more than one installation? If yes, which prerequisites must be fulfilled?

_____

_____

1-2-3 Which structure category forms the basis of the point of delivery ID?

Data Type	Value
Structure category	

How is the structure category compiled?

_____

_____

_____

_____

Make a note of your business partner's point of delivery ID.

Data Type	Value
Point of delivery ID	

1-2-4 What is the Customizing path needed to define the structure of the point of delivery ID?

_____

_____

Where can you save default values for this structure?

_____

_____

_____

Solutions

Unit: EDM-Relevant Data Objects

Topic: Getting to Know the Data Model

Internal Use SAP Partner Only

1-1

1-1-1 Identify business partner ***TP0101A0##*** and display the customer environment.

Choose *Utilities Industry* → *Customer Service* → *Front Office/Customer Interaction Center* → *Customer Interaction Center*, or transaction *CIC0*. Enter the business partner number in the *Partner* field in the search area. Confirm the selection by choosing *Enter* (twice).

1-1-2 Display the installed device. Which device category, basic device category and register group are allocated to this meter?

Data Type	Value
Device category	TD-INT15-00
Basic device category	Meter
Register group	TP-IN-00

1-1-3 Branch to the detailed display of the *Register group*. What is the register code?

_____

Data Type	Value
Register code	EDM_TRAINING

What important function does this field perform?

The register code identifies the meter reading task that is performed on this register. In combination with the point of delivery, the register can be used for identification purposes.

1-1-4 What does the *Interval Length* field do and which values are permissible for this field?

The field *Interval length* determines the time intervals between the profile values and a profile. The interval length is determined from the allocated interval length and the interval length category.

What dependency is created when you enter a permissible value in this field?

No meter reading documents are created when you create a meter reading order. During meter reading order creation, the installations behave in the same way as flat-rate installations.

1-2

1-2-1 Display the point of delivery for business partner *TP0101A0##.*

In the navigation area of the CIC, go to the *Environment* tab page and select the *Installation* data object. To display the object, you can either double-click on it or select *Display Utility Inst.* from the context menu (right mouse click). The point of delivery is displayed at the bottom of the screen. Choose the *FullScrn* (Full Screen) icon. You will automatically branch to the *Display Point of Delivery* transaction.
Alternatively, you can access this transaction via the SAP Menu. Choose *Utilities Industry → Technical Master Data → Point of Delivery → Display*.

1-2-2 What are the two possible roles of the point of delivery?

Role 1	Deregulation point of delivery
Role 2	Technical point of delivery

What is the difference between these roles?

The deregulation role is used for electronic data exchange with IDE (Intercompany Data Exchange).

The technical role enables you to exchange meter reading results.

Which role does your business partner's point of delivery have?

The business partner has a deregulation point of delivery. You can see this in the *Display Point of Delivery* transaction. In the work area, select the *Alloc.* tab page and then the *Inst.* tab page. The *Deregulation* field is selected.

Can a point of delivery be allocated to more than one installation? If yes, which prerequisites must be fulfilled?

A deregulation point of delivery can be allocated to a variety of installations. The following prerequisites must be fulfilled:

- The installations must be allocated the same division categories (division).
- The installations must belong to the same premise
- The installations must have service types that refer to different service categories

1-2-3 Which structure category forms the basis of the point of delivery ID?

Data Type	Value
Structure category	Metering Code Germany

How is the structure category compiled?

The constitution of the structure category can vary. It is possible to make individual or country-specific adjustments. The metering code for Germany is made up of a 33-digit key that is structured in the following way:

- 2-digit international country identification
- Max. 6-digit number of the distribution company
- 5-digit postal code of the area where the point of delivery is located
- Max. 20-digit unique identification of the point of delivery

Make a note of your business partner's point of delivery ID.

Data Type	Value
Point of delivery ID	DE 123456 69120 EDM_P_0##

1-2-4 What is the Customizing path needed to define the structure of the point of delivery ID?

From the SAP menu, choose *Tools → Customizing → IMG → Project Management.* In the SAP reference IMG choose *SAP Utilities → Master Data → Point of Delivery → Define Structure of Point of Delivery ID.*

Where can you save default values for a structure?

Choose an item (*Structure*) in this activity and select *Field Settings.*

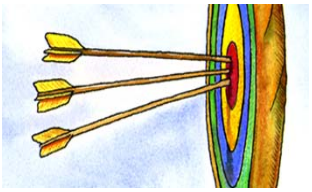
Profile Header: Unit Contents

- Profile Header
- Profile Types and Profile Categories
- Create Profile Header

Profile Header: Unit Objectives

At the conclusion of this unit, you will be able to:

- **Define and use profile headers.**
- **Explain and use profile header data.**
- **Understand the difference between profile headers and profile values.**
- **Describe profile types.**
- **Describe profile categories.**
- **Create a profile header.**



Profile Header

- Profile Header
- Profile Types and Categories
- Create Profile Header

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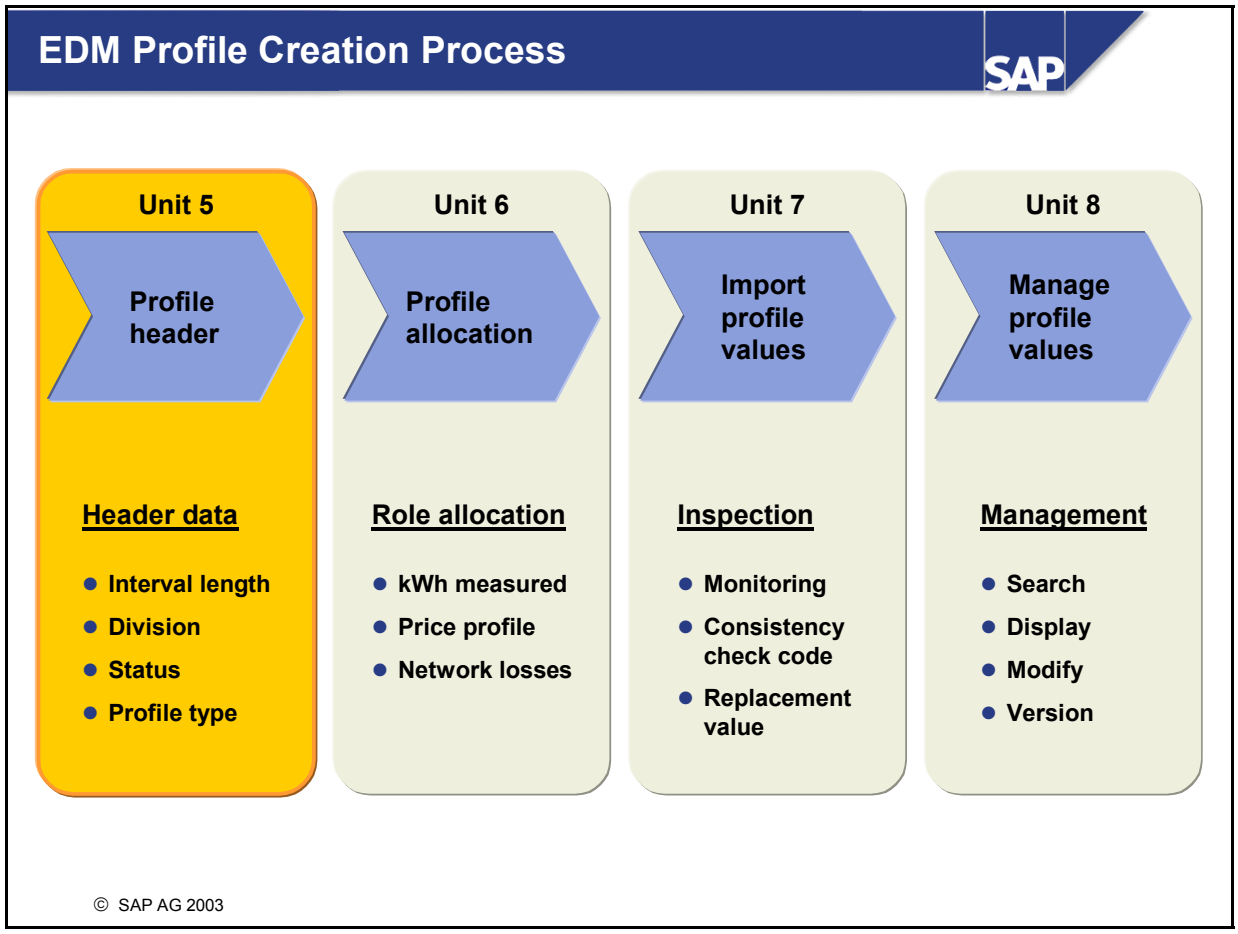
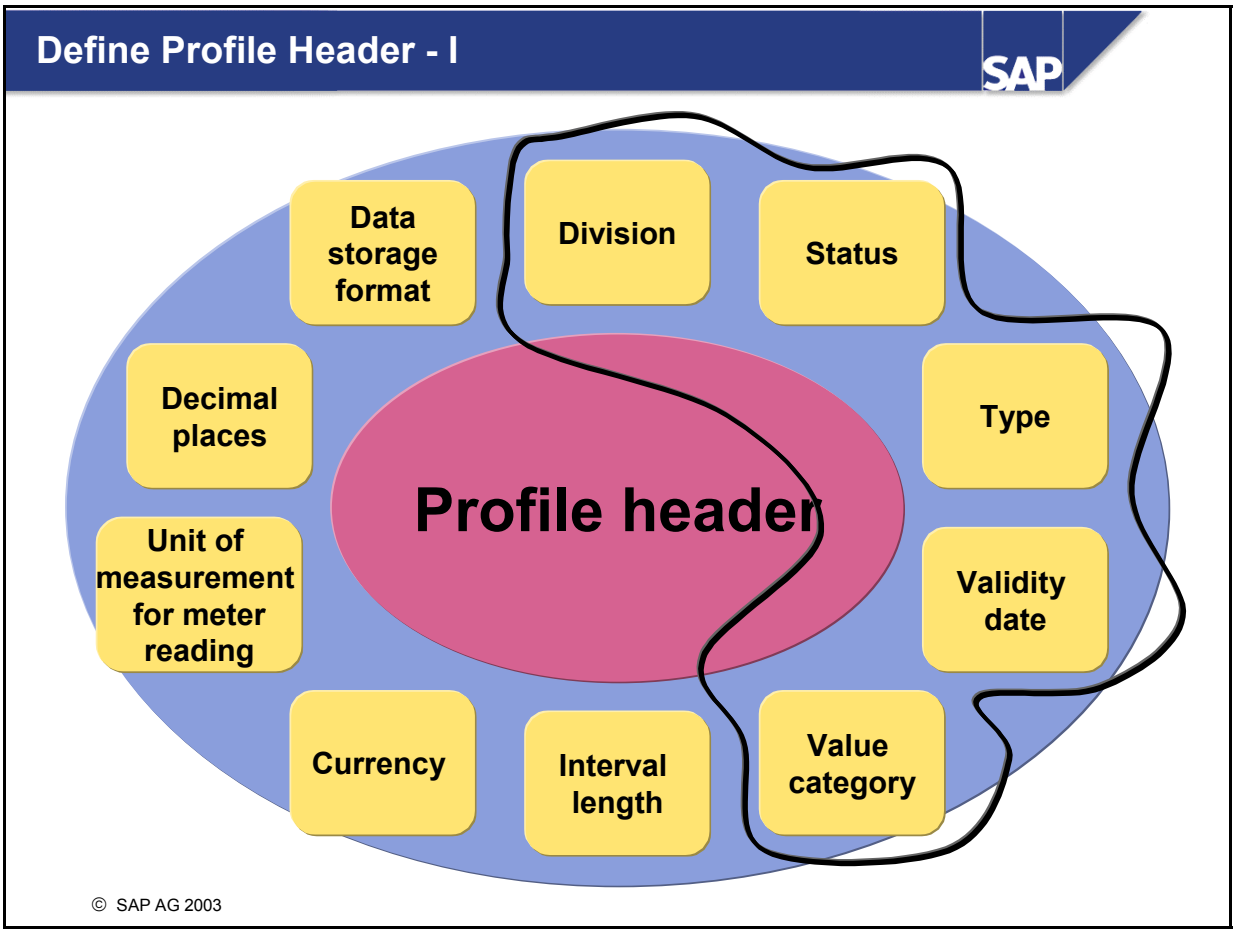


- The profile creation process within EDM is referred to throughout the IUT225 course in Units 5, 6, 7 and 8.
- The first step in this process is creating the profile header.
- The profile header data sets the characteristics of the profile. The allocation process allocates the profile header to the profile values. The profile header must be created before the profile can be allocated to an object within the system. The profile values can then be imported and managed within the system.



- **Profile header – defines the profile values stored in the profile**
- Division: Company-internal key for the division category that is predefined by the *Utilities Industry* (IS-U) component.
- Status:
  - Defines the status of the profile based on standard SAP status
  - The different kinds of current status include active/usable, inactive, allocated/deletion flag set
  - Customer-defined statuses are possible
- Profile type: Describes the type of data stored in the profile. Can be adjusted to meet the requirements of business processes
- Validity date: Date from/to which the profile is valid
- Profile value category: Sets the category of the profile values, this includes, amount, factor, quantity, demand, price, other
- Date when profile values are archived: This field contains the date up to which the archiving has occurred.

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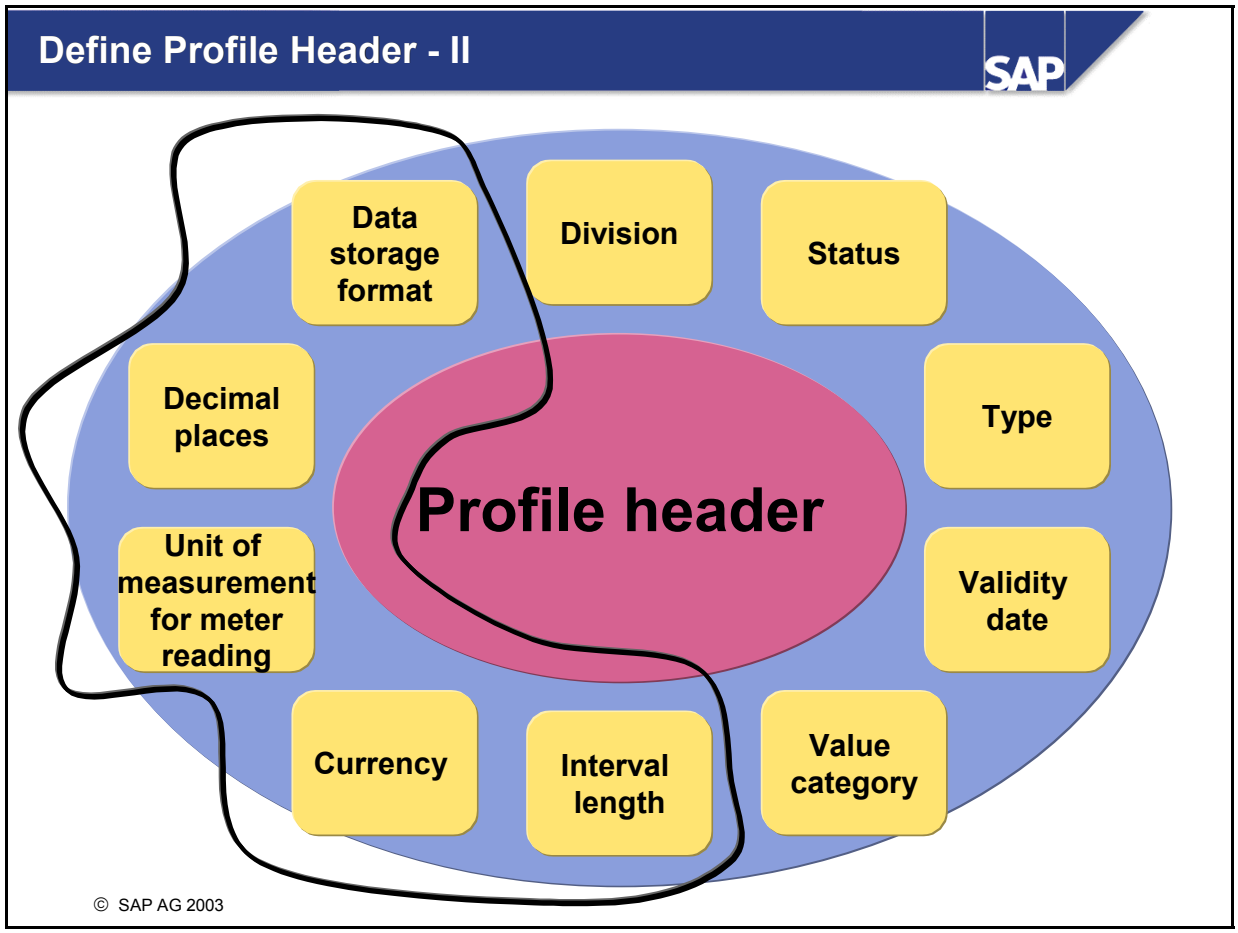
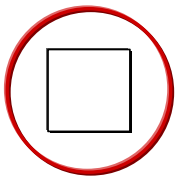


- **Profile header – defines the profile values stored in the profile**
- Interval length: Interval between two values in a profile (for example 5, 10, 15, 30, 60 minutes)
- Currency: Specifies the currency for the profile values (for example Euro or US Dollar for a price profile).
- Unit of measurement: Unit of measurement for the consumption values (for example kW, kWh, mWh,).
- Decimal places: Number of decimal places to be stored for the profile values.
- Data storage format:

  Cumulative values: Indicates that at a time *t*, the value is dependent of the values of *t-n*. Generally this is not the case with an interval meter.
- Note: The following elements of the header data will be discussed in unit Profile Import: Consistency checks, replacement value group, reference profile and authorization group.

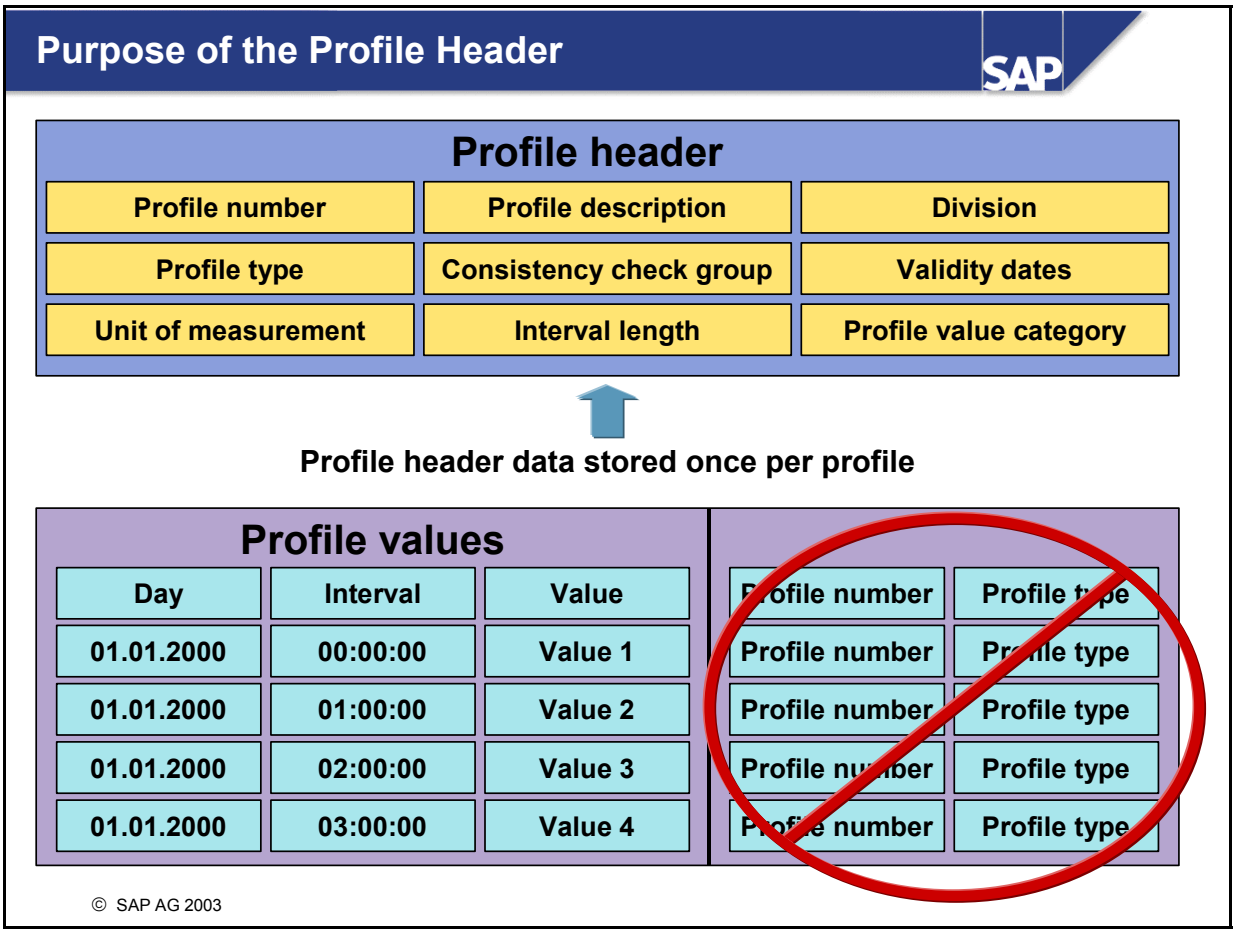
Data Storage Format - Cumulative Values

Meter Value	EDM Display
100kWH	100kWH
103kWh	203kWh
200kWH	403kWH



Meter Value	EDM Display
100kWH	100kWH
103kWh	103kWh
200kWH	200kWH

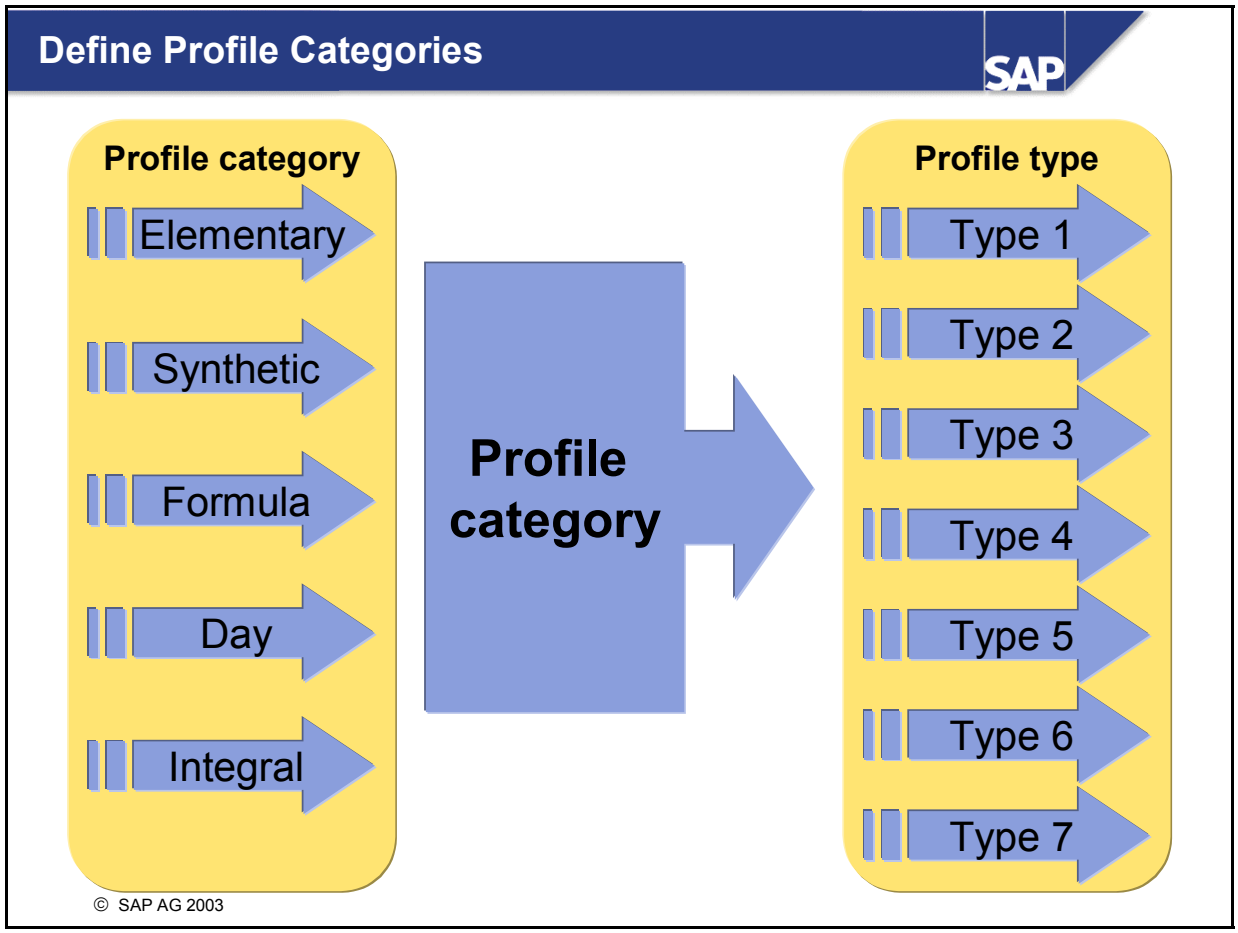
- The **Cumulative Values Checkbox** on the profile header is used in the following manner.
  - If checked, the meter read value for each interval is added to the previous intervals measured value (as shown above in the first example)
  - If not checked, the meter value is the same as the value displayed in EDM (typical for interval meters)



- The profile header is used in order to save database storage space. The profile header contains characteristics of the profile values. If these characteristics were stored at interval level, a very large amount of data storage space would be needed. The concept of the profile header allows the interval data values to be stored and archived in an efficient manner. If profile values are archived, the profile header remains in the system as a link to the archived profile values.

Profile Header: Profile Types and Categories

- Profile Header
- Profile Types and Categories
- Create Profile Header



- Profile categories:
  - Characterize the profile type
  - Are predefined by SAP
  - Are not customizable
- There are five predefined profile categories:
  - Elementary: Contains values that are imported or entered manually
  - Synthetic: Contains values that were created for a customer group. These values can be grouped together according to season, time of day or day type.
  - Formula: Contains values calculated using a predefined formula and using other profiles. For example, you can use a formula profile to calculate the energy feeding curve of the grid.
  - Day: Contains values that are measured at identical intervals and that, together, describe one day. Day profiles are allocated to synthetic profiles to reproduce the consumption of one day such as a weekend day in summer or a weekday in winter.
  - Integral: Only used internally within the system

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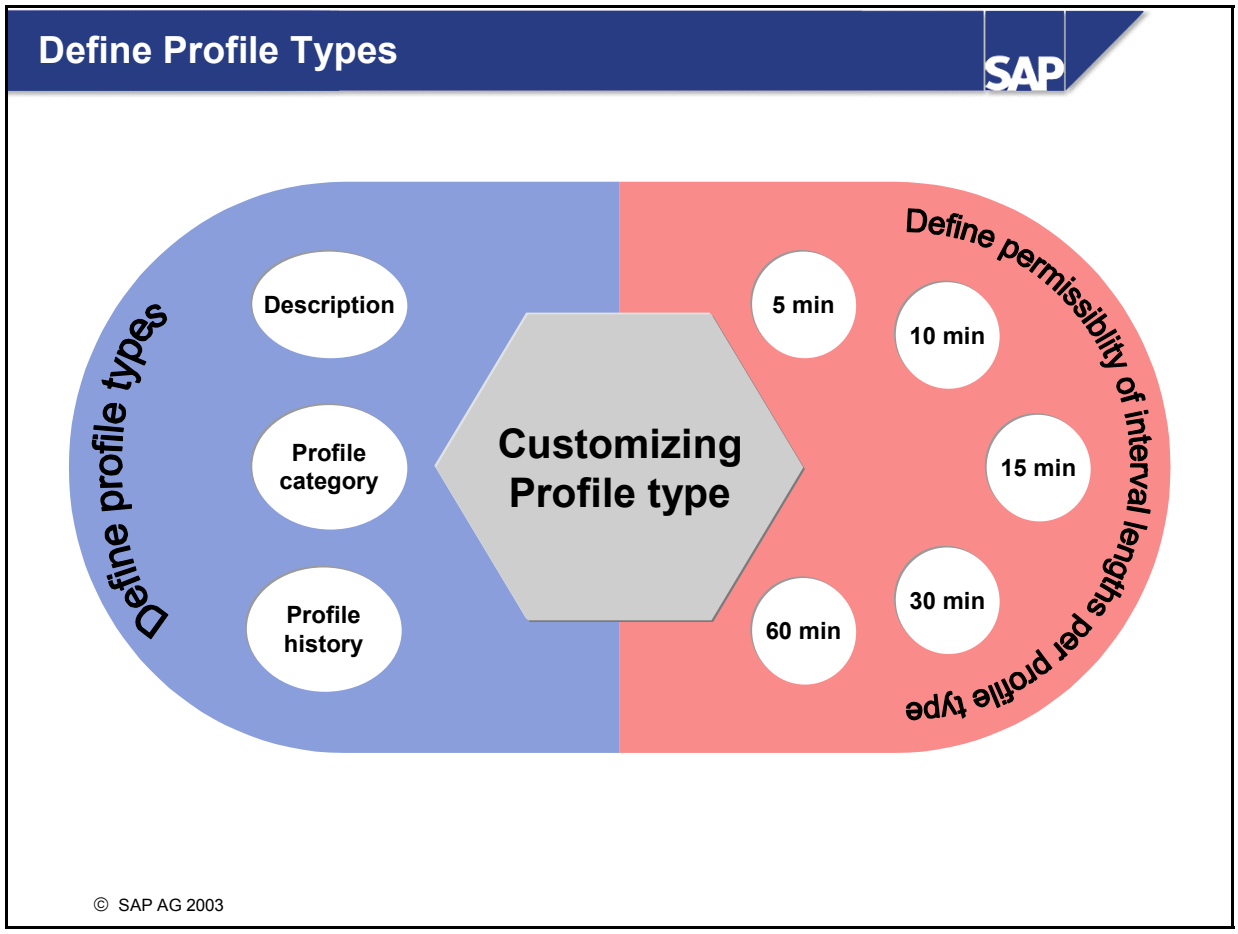
Examples of Profile Types and Corresponding Categories

Pre-defined profile categories

Profile types:	Elementary	Synthetic	Formula	Day
Historical	X			
Forecasts	X			
Schedule	X			
Synthetic		X		
Formula			X	
Day				X

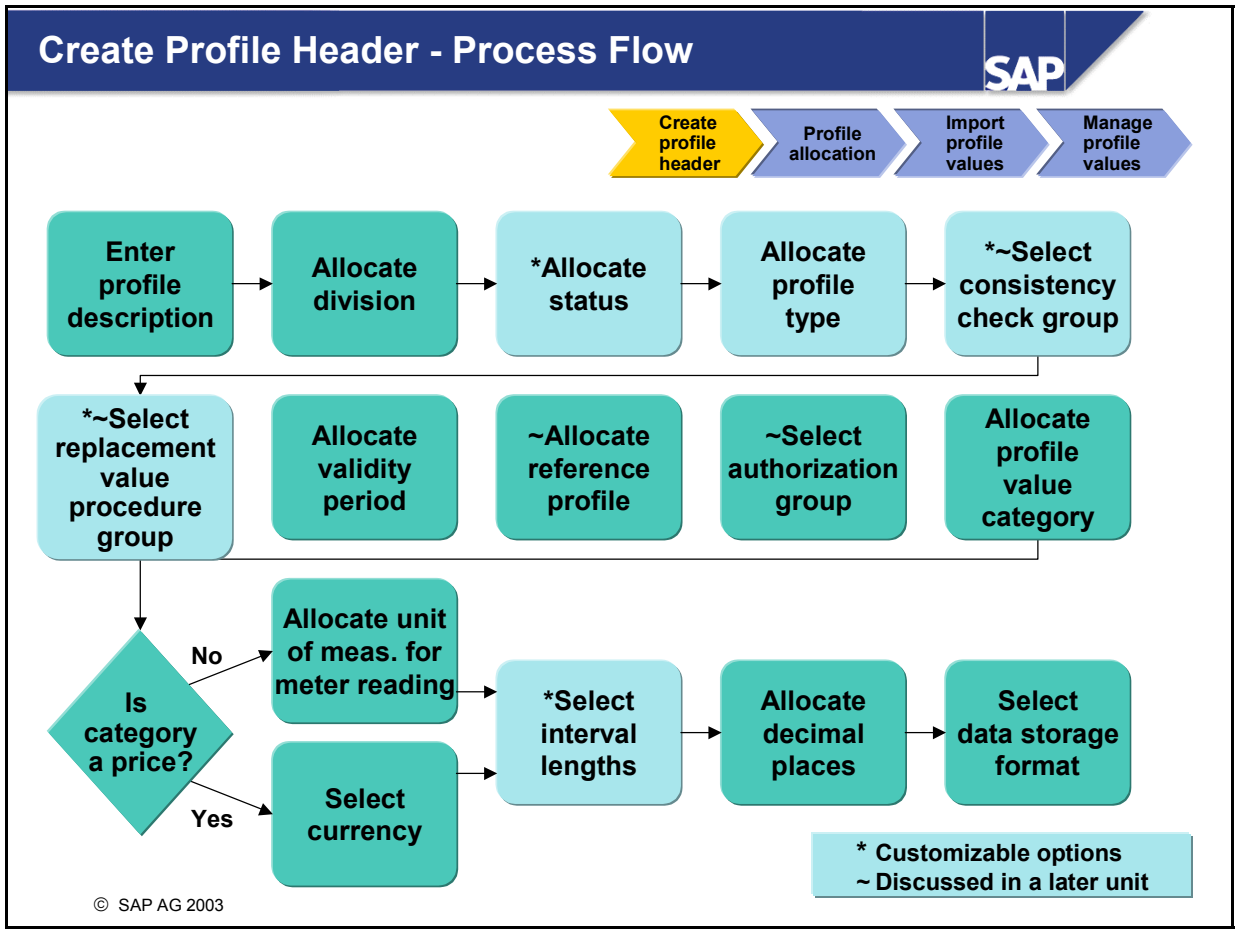
- There are two important elements of the header data:
  - Profile categories
  - Profile types:
- The above mentioned profile types are provided in initial customizing (historical, forecast, etc.). Further profile types can be customized by the customer.
- When new profile types are created, they are allocated to profile categories, which are predefined by SAP.



- Profile types:
  - Are customizable based on business process
  - Are stored within the profile header data
  - Are assigned to a profile category
- Profile types are defined and allocated to a profile category in Customizing.
- Customizing path: IMG -> *SAP Utilities* -> *Energy Data Management* -> *Basic Settings* -> Profile Type:
  - Define profile types
    - Description (fee choice of text to describe the profile type)
    - Profile category (elementary, synthetic, formula, day)
    - Profile history (historical, schedule, forecast) – used for information only
  - Define permissiblity of interval lengths per profile type
    - For each new profile type, define the permissible interval lengths (5, 10, 15, 30, 60)
- For more information on Customizing, see the EDM Basic Customizing Settings Cookbook on the Utilities homepage in SAPnet

Profile Header: Create Profile Header

- Profile Header
- Profile Types and Categories
- Create Profile Header



- Definable options:
  - Status
  - Profile types (see slide above for sample of a Customized profile type)
  - Interval lengths:
    - Customizing path: IMG -> ***SAP Utilities -> Tools -> System Modifications -> User-defined Enhancements for EDM -> Interval Lengths***
  - Consistency check groups (see unit on Importing Profiles)
  - Replacement value procedure groups (see unit on importing profiles)
- Details within the profile header can be maintained for the synthetic and formula profiles (see unit on Synthetic & Formula Profiles)
- The system automatically assigns a profile number if you have already defined number ranges in Customizing (see the Cookbook Profile Management Customizing)

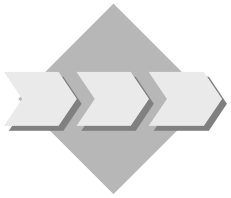
Exercises

Unit: Profile Header

Topic: Create Profile Header

At the conclusion of this exercise, you will be able to:

- Create a profile header



The company DisCo would like to implement Profile Management. To do this, different profiles must be created so that data entered with an interval meter can be read, for example.

1-1 EDM profiles are processed in several steps. In the first step, the basic characteristics are created in the profile header.

1-1-1 Name three important characteristics that are recorded in the header data of a profile.

_____

_____

_____

What does the profile header do?

_____

_____

Can meter reading values be treated differently (here data storage format)?

_____

_____

1-1-2 How many different kinds of profile categories can you name and where are they indirectly stored in the profile header?

_____

_____

_____

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_____

Can customer-specific profile categories also be created?

_____

_____

1-1-3 Create a new profile header to manage measured profile values from the division *Electricity*. Enter the following data:

Profile description:	TP0101A0## *Measured Consumption*
Division:	Electricity

In the *General* tab page, select the following entries in the *Profile Data* section box:

Profile type:	*Historical Profile*
Cons. check group	*Checks for Status of Profile Value*s
Valid from:	01.01.2001
Valid to:	31.12.9999

In the *Value Data* section box, select the following entries:

PV category:	*QUANTITY*
MeasUnit for MR:	*kWh*
Interval length:	*15 Minutes*
Decimal places:	*7*

Save your entries and make a note of the profile number.

_____

Solutions

Unit: Profile Header

Topic: Create Profile Header

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1-1 EDM profiles are processed in several steps. In the first step, the basic characteristics are created in the profile header.

1-1-1 Name three important characteristics that are recorded in the header data of a profile.

Interval length
Interval between the profile values of a profile.

Profile type
User-defined form of the profile category predefined by SAP.

Profile value category
The profile value category is predefined and characterizes the profile values that are allocated to a profile header. For example: Quantity, demand, price, amount, factor, or other.

What does the profile header do?

The profile header is used to save database storage space. The characteristics in the profile header are transferred to the profile values.

Can meter reading values be treated differently (here data storage format)?

Yes. You can activate the *Accumulated Value* indicator.

1-1-2 How many different kinds of profile categories can you name and where are they indirectly stored in the profile header?

Elementary profile:
Profile containing values that have been imported or entered manually.
Synthetic profile:
Profile containing values generated on the basis of predefined periods (defined by day and season groups) and corresponding day or annual profiles.
Formula profile:
Profile containing values calculated using a formula.
Day Profile:
Profile containing values measured at identical intervals and that, together, make up one day.
Integral Profiles:
Profile calculated from a synthetic profile by adding together individual consumption values.

You allocate the profile type to a profile category in Customizing. The profile type is entered in the profile header. Several profile types can be allocated to one profile category.

Can customer-specific profile categories also be created?

No. Profile categories are predefined by SAP. You can, however, define customer-specific profile types that are then allocated to the profile categories.

1-1-3 From the SAP menu choose *Utilities* → *Energy Data Management* → *Profile Management* → *Profile Header* → *Create* or transaction *EEDM06*. Enter the data provided in the exercise.

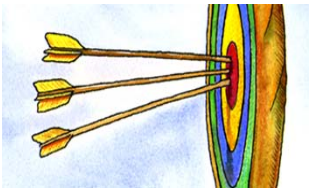
Profile Allocation: Unit Contents

- Allocating Profiles to IS-U/CCS Objects
- Profile Roles
- Role Category
- Profile Allocation Process

Profile Allocation: Unit Objectives

At the conclusion of this unit, you will be able to:

- **Recognize the IS-U/CCS objects to which a Profile can be allocated.**
- **Explain Profile Roles.**
- **Describe Profile Role Categories.**
- **Customize Profile Roles.**
- **Allocate a Profile.**



Profile Allocation: Allocating Profiles to IS-U/CCS Objects

- Allocating Profiles to IS-U/CCS Objects
- Profile Roles
- Role Category
- Profile Allocation Process

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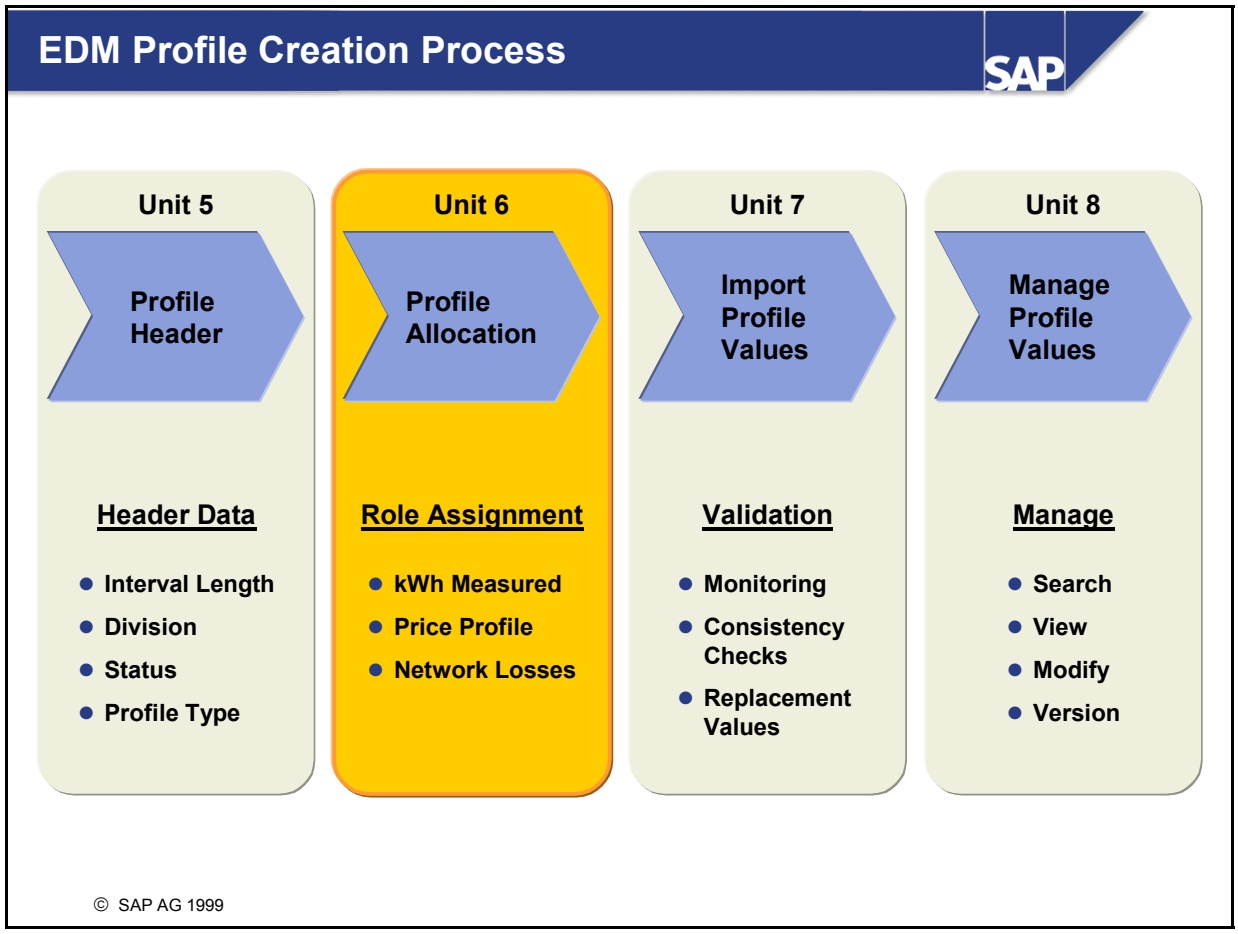

- The profile creation process within EDM is referred to throughout the IUT225 course in units 5, 6, 7 and 8.
- The first step in this process is creating the Profile Header. This was previously discussed in unit 5.
- Now that the profile has been created (via the Create Profile Header process), the profile must be allocated to an entity within the system.
- In this unit, profile allocation will be discussed. The allocation of a profile simply attaches the Profile Header to a data object within IS-U/CCS. These two steps allow the actual profile values (i.e. raw usage data) to be imported into the system.

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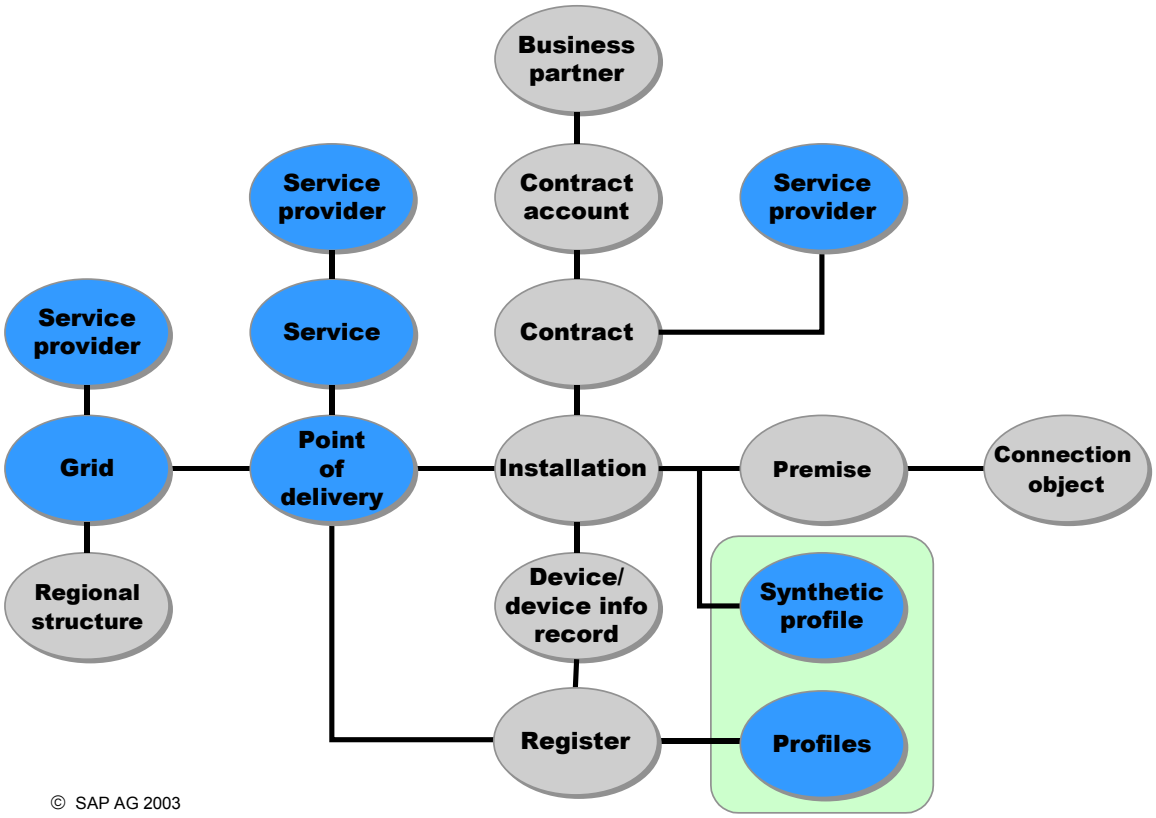
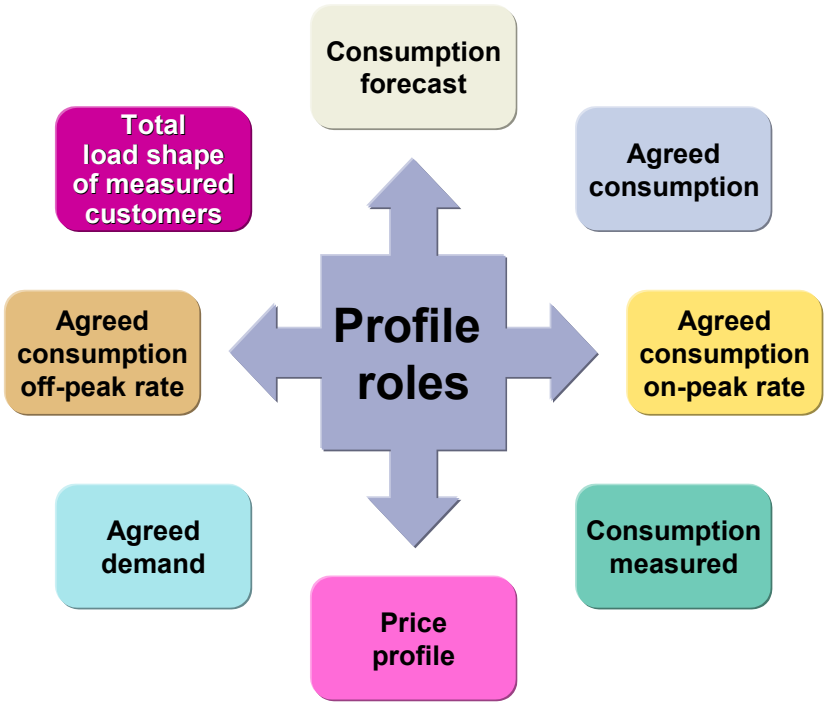
Profile Allocation Objects in IS-U/CCS



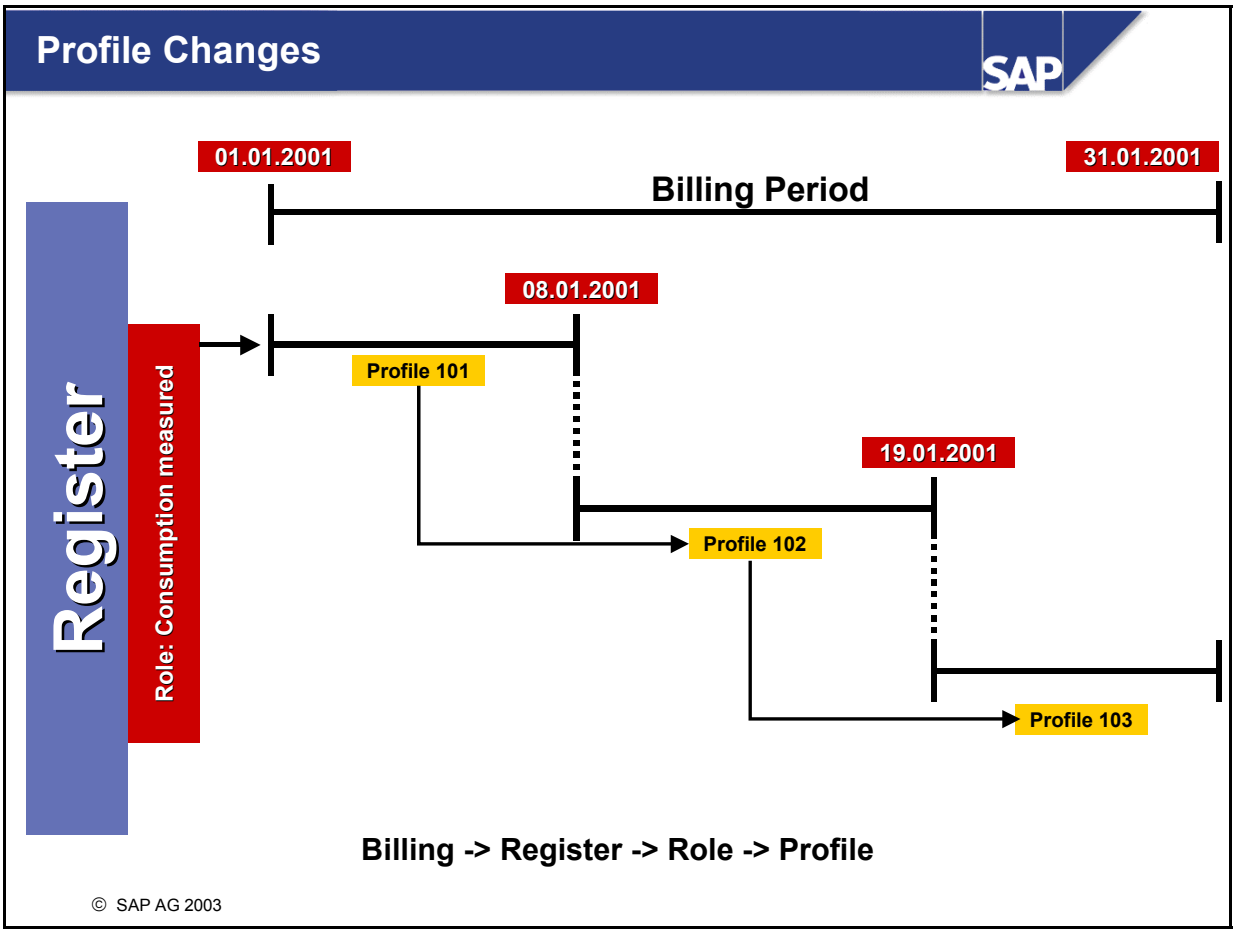
Profile Allocation: Profile Roles

- Allocating Profiles to IS-U/CCS Objects
- Profile Roles
- Role Category
- Profile Allocation Process

Profile Roles



- **The role determines which task this profile carries out on the register.**
- Profile roles are used for the following:
  - Import and export of profile values
  - The profile of the data to be processed is identified using the point of delivery, the point of delivery register code and the role category.
  - In real time pricing (RTP) billing, roles enable the flexible allocation of profiles to input parameters from the RTP interface
  - In the RTP rate, the role replaces the register operand as the source of consumption data
  - In replacement value creation, the role determines the reference profile
  - In settlement processing, roles identify settlement parameters



- The profile is allocated to the register in time slices via the role.
- For example:
  - A customer (this means the register) is initially allocated profile 101 via the *consumption measured* role.
  - On the January 08, 2001, the customer is allocated a new measured profile with the number 102.
  - Another change is needed on January 19, 2001. As a result the customer is allocated profile 103.
  - All profiles are maintained in the system. In the billing period January 01 2001 - January 31 2001, the following profiles are processed according to time slices via billing:
    - 101 Consumption measured from 01/01/2001 – 01/08/2001
    - 102 Consumption measured from 01/08/2001 -01/18/2001
    - 103 Consumption measured from 01/19/2001 – 01/31/2001

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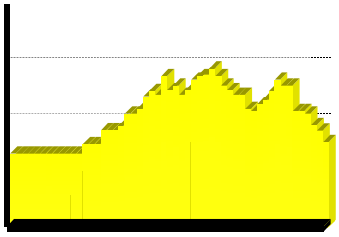
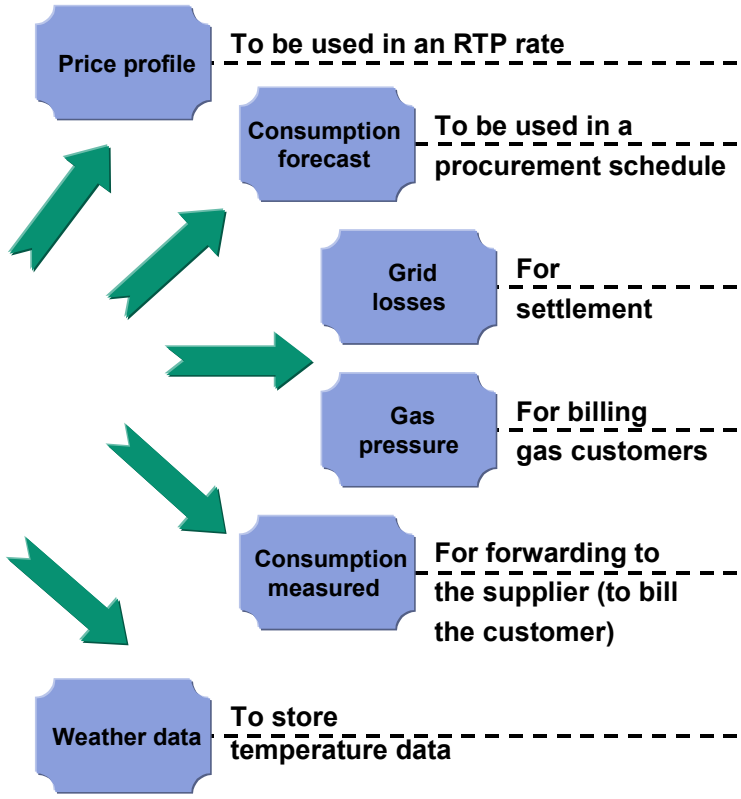
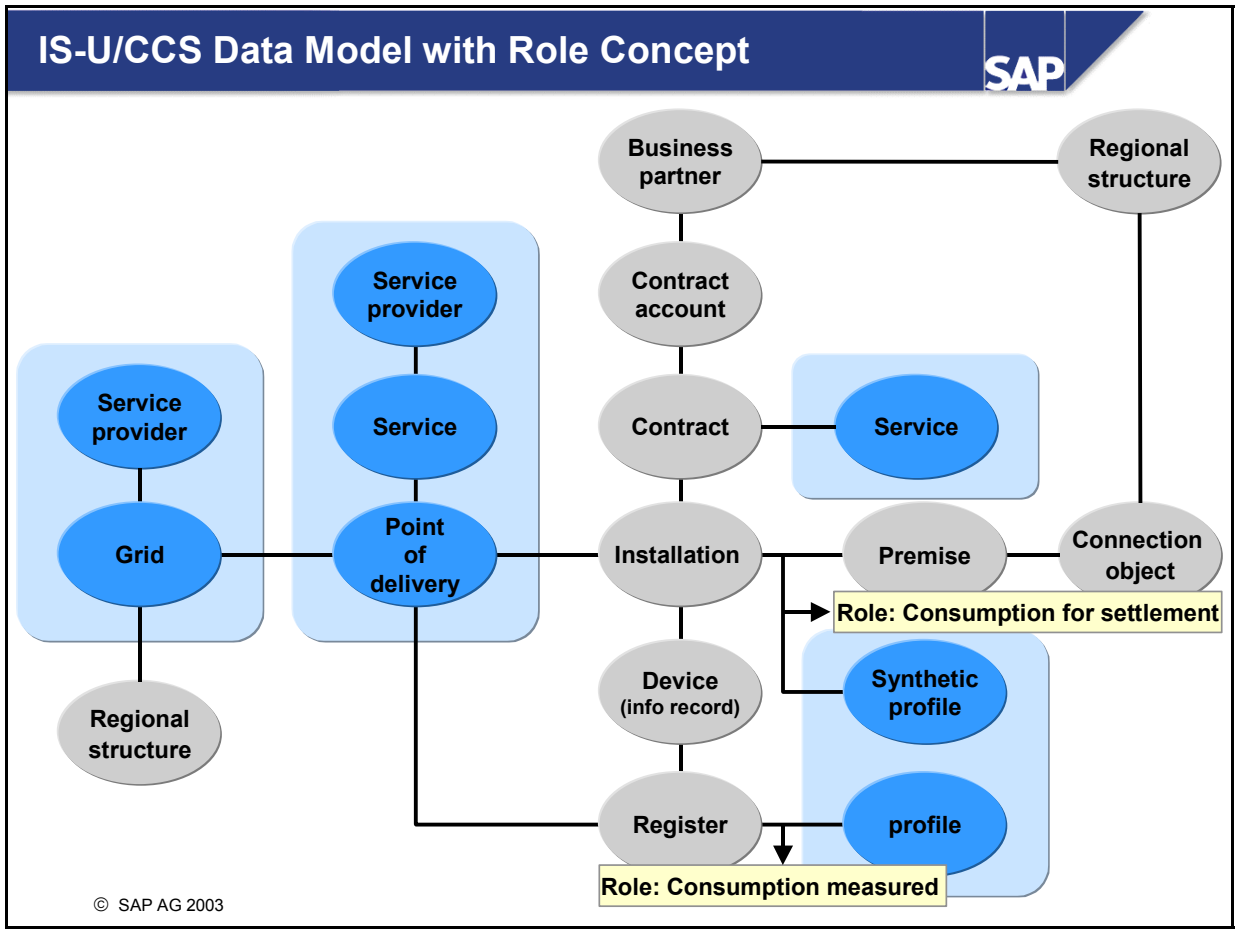
Role Allocation

- What is the role of the profile?



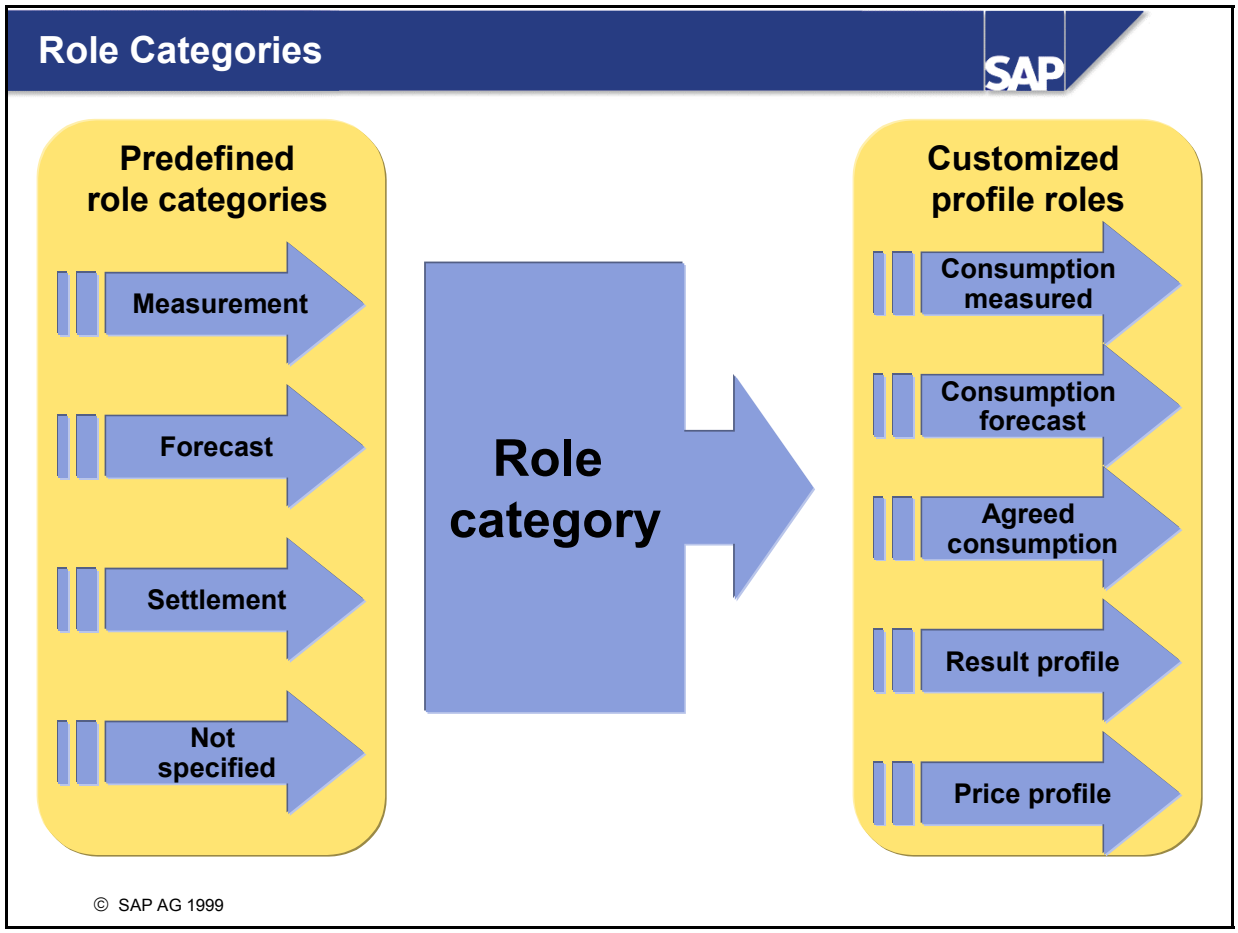


- The following are example profile roles provided as standard in Customizing:
  - Consumption measured
  - Consumption forecast
  - Agreed demand
  - Price profile
  - Agreed consumption
  - Agreed consumption
    On-peak rate
  - Agreed Consumption
    Off-peak rate
  - You can define other profile roles in Customizing.



Profile Allocation: Role Category

- Allocating Profiles to IS-U/CCS Objects
- Profile Roles
- Role Category
- Profile Allocation Process



- Roles: Refer to the profile from which values are to be used
  - Some roles are defined by SAP. You can define further roles in Customizing (see Customizing: *SAP Utilities -> Energy data management -> Profile management -> Define roles for profile allocation)*
- There are four role categories defined by SAP:
  - Measurement: Profiles allocated to this role category describe consumption measured by an interval meter. You can only allocate one profile with this role category to a register. When profile values are imported using the point of delivery and its register code, this role category is used to identify the profile into which these values are to be imported.
  - Forecast: Profiles allocated to this role category describe the consumption forecast for the interval meter. You can only allocate one profile with this role category to an interval meter. The frequency of the roles in this category must always be 1. The forecast is used by the system operator for the procurement schedule.
  - Settlement: Profiles allocated to the role category settlement are included in the settlement process. Only one profile with a role in this category can be allocated to a register or an installation.
  - Not specified: Use this category for roles with unspecified functions

Examples of Roles and Corresponding Role Categories

Pre-defined role categories

Roles	Measurement	Forecast	Settlement	Not specified
Consumption measured	X			
Consumption forecast		X		
Agreed demand				X
Price profile				X
Consumption for settlement			X	
Profile to be sent				X
Result profile			X	
Input parameter			X	

- You can define roles and allocate them to role categories defined by SAP

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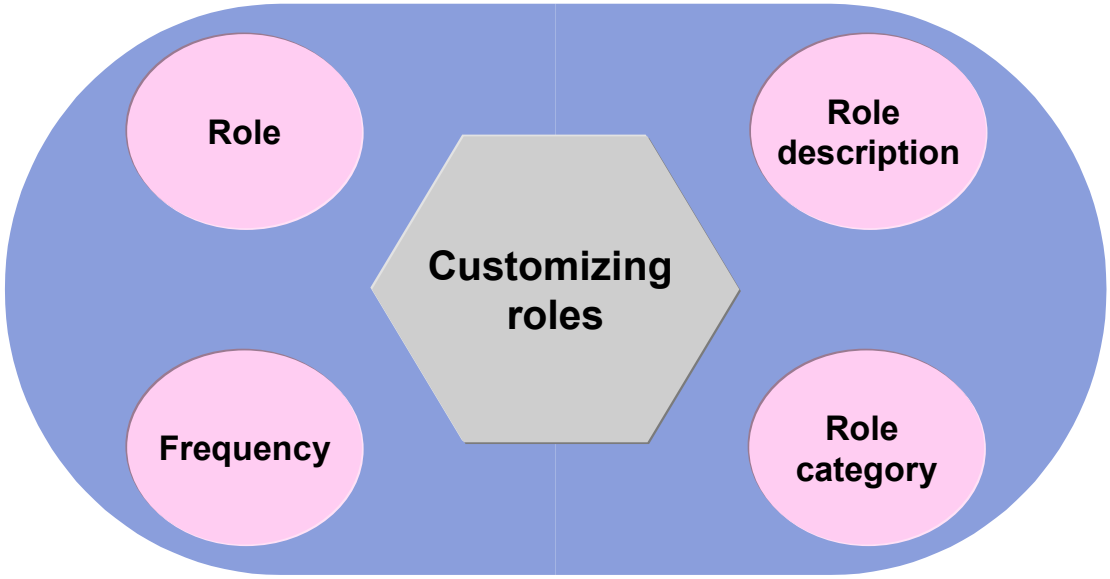
Customize Roles for Profile Allocation



- In Customizing, select *SAP Utilities -> Energy Data Management -> Profile Management -> Define Roles for Profile Allocation*.
  - Role: Identification for the role of a profile allocation
  - Role description: Text describing the role of a profile allocation
  - Frequency (Frequency of allocation per role): Number that indicates how often a profile with a certain role may be allocated to an interval meter. You must specify 1 for the frequency of roles in role category *Measurement* or *Forecast*
  - Role category: Category to which the role has been allocated
- Roles to be used are defined in Customizing and allocated to profile categories predefined by SAP
- For more information about Customizing, see the *Basic Customizing Setting*s Cookbook.

Profile Allocation: Profile Allocation Process

- Allocating Profiles to IS-U/CCS Objects
- Profile Roles
- Role Category
- Profile Allocation Process

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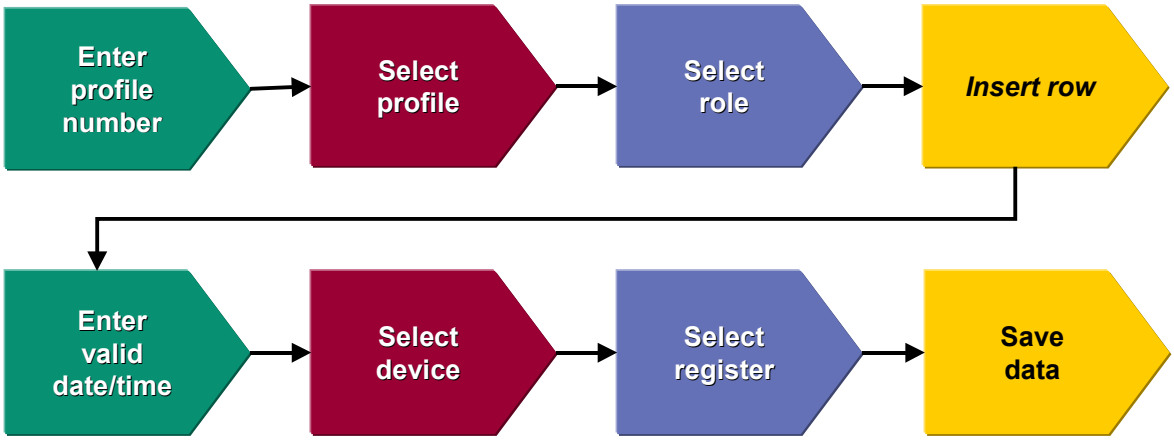
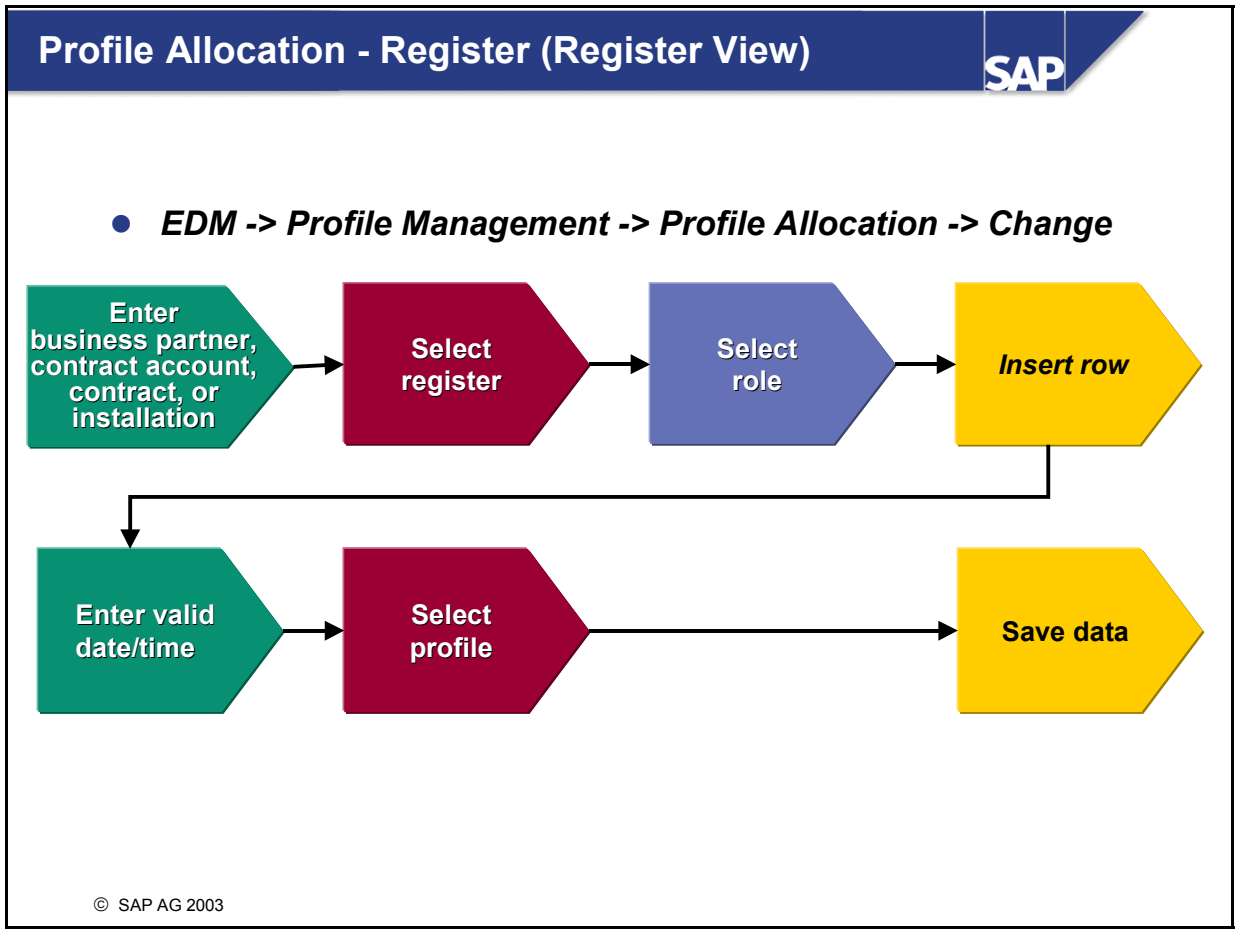
Profile Allocation - Register (Profile View)

- *EDM -> Profile Management -> Profile Allocation -> Change*



- There are two system views by which the profile can be allocated:
  - Register view: Search by any of the following to drill down to the register:
    - Business partner
    - Contract account
    - Contract
    - Installation
  - Profile view: Search by the profile to allocate
- Note that from the profile view:
  - Profile data is shown in the upper right side of the screen



- There are two system views by which the profile can be allocated:
  - Register riew: Search by any of the following to drill down to the register:
    - Business partner
    - Contract account
    - Contract
    - Installation
  - Profile view: Search by the profile to allocate
- Note that from the register view:
  - Register data is shown in the upper right side of the screen

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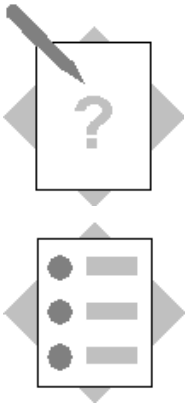
Exercises



Unit: Profile Allocation

Topic: Allocate a Profile to a Register

At the conclusion of this exercise, you will be able to:

- Allocate a profile to a register via the profile view
    1. Allocate a profile to a register via the register view

Note:

When the data was set up, only one register was created for each device. Nevertheless, you can still allocate profiles in different ways:
One participant allocates the profile to the register via the profile view while the other allocates the profile to the register via the register view.

1-1 Once the profile header has been created, it must be allocated to IS-U data objects. You can do this in two ways. Choose either task 1-2 **or** 1-3 to allocate a profile.

1-1-1 Can *synthetic profiles* be allocated to registers?

_____

1-1-2 Roles are needed for profile allocation. In the Customizing menu for SAP Utilities, find the activity where you maintain the *roles for profile allocation*. What is the path in Customizing?

_____

_____

1-1-3 Which role categories are predefined?

_____

_____

_____

_____

1-2 In the SAP menu choose ***Utilities Industry → Energy Data Management → Profile Management → Profile Allocation → Change***. In the *Prof*. tab page, enter the profile number that you created previously. Select 01/01/01 as the selection date.

1-2-1 Display the profile. Describe how you do this?

_____

_____

1-2-2 First of all, allocate the *Consumption Measured* role to your profile.

_____

_____

Allocate the first register of device *TP0101A0##* to your profile starting from 01/01/01.

_____

_____

1-2-2 Save your entries. Alternatively, you can allocate the profile from the register view in the following exercise.

1-3 In this exercise, you allocate a profile to a register via the register view. (Note: If you have already carried out the profile allocation in exercise 1-2, you can no longer execute this exercise).

1-3-1 In the SAP menu choose ***Utilities Industry → Energy Data Management → Profile Management → Profile Allocation → Change***. Enter 01/01/01 in the *Selection Date* field. In the selection area (tab page *BP*), enter the business partner, the contract account, the contract, or the installation number of business partner *TP0101A0##* and choose *Enter*.

_____

_____

1-3-2 Enter the number of the profile that you created in the *Profile Header* exercise

_____

_____

1-3-3 Save your entries.

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Solutions

Unit: Profile Allocation

Topic: Allocate a Profile to a Register

1-1

1-1-1 Can *synthetic profiles* be allocated to registers?

No. Amongst other things, *synthetic profiles* represent customer groups. *Synthetic profiles* are allocated to installations.

1-1-2 Roles are needed for profile allocation. In the Customizing menu for SAP Utilities, find the Customizing activity for maintaining the *roles for profile allocation*. What is the path in Customizing?

In Customizing for SAP Utilities choose ***Energy Data Management → Profile Management → Define Roles for Profile Allocation***.

1-1-3 Which role categories are predefined?

Measurement:
Profiles with this role category describe the consumption measured by an interval meter.

Forecast
Profiles with this role category describe the consumption forecast by an interval meter.

Settlement:
Profiles allocated to this role category are included in the settlement process.

Not specified:
Profiles that do not have a specified function are allocated the *Not Specified* role category.

1-2 In the SAP menu choose ***Utilities Industry → Energy Data Management → Profile Management → Profile Allocation → Change***. In the *Prof*. tab page, enter the profile number that you created previously. Choose 01/01/01 as the selection date.

1-2-1 Display the profile. Describe how you do this?
Once you have entered the profile number and the selection date in the selection area, choose *Enter*. The search results are displayed in the *navigation area*. The result is the profile number. You can display the relevant data in the *work area* by double clicking on the profile number. You can also display the result using the right mouse button and selecting *Display* from the context menu. In the following process, make sure you know which objects are in the navigation area.

1-2-2 First of all, allocate the *Consumption Measured* role to your profile.
The *Role* field is blank. Select *Consumption Measured* from the list.

Allocate the first register of device *TP0101A0##* to the profile starting from 01/01/01.

Choose the *Insert Line* icon, or in the menu bar choose *Edit → Table Entries → Insert Line*. Make a note of the *From-Date*. It should be 01/01/01.
In the *Device* column, enter device number *TP0101A0##* and in the *Register* column, enter *1*.

1-2-2 Save your entries. Alternatively, you can allocate the profile from the register view in the following exercise.

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1-3 In this exercise, you allocate a profile to a register via the register view. (Note: If you have already carried out the profile allocation in exercise 1-2, you can no longer execute this exercise).

1-3-1 In the SAP menu choose ***Utilities Industry → Energy Data Management → Profile Management → Profile Allocation → Change***. Enter 01/01/01 in the *Selection Date* field. In the selection area (tab page BP), enter either the business partner, the contract account, the contract, or the installation number of business partner *TP0101A0##* and choose *Enter*. All of the data objects are displayed in the *navigation area*. Double click on the *Register* to display register and installation data in the *work area*.

1-3-2 To allocate the profile, enter the number of the profile that you created in the *Profile Header* exercise.

To display the profile header, double click on the profile number.

1-3-3 Save your entries.

The allocated profile is displayed in the navigation area.

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Import Profile Values: Unit Contents

- Profile Import
- Import Monitoring
- Consistency Checks and Groups
- Replacement Value Procedures and Groups

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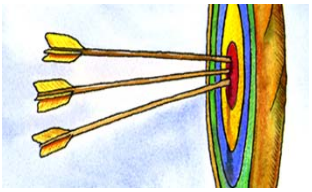
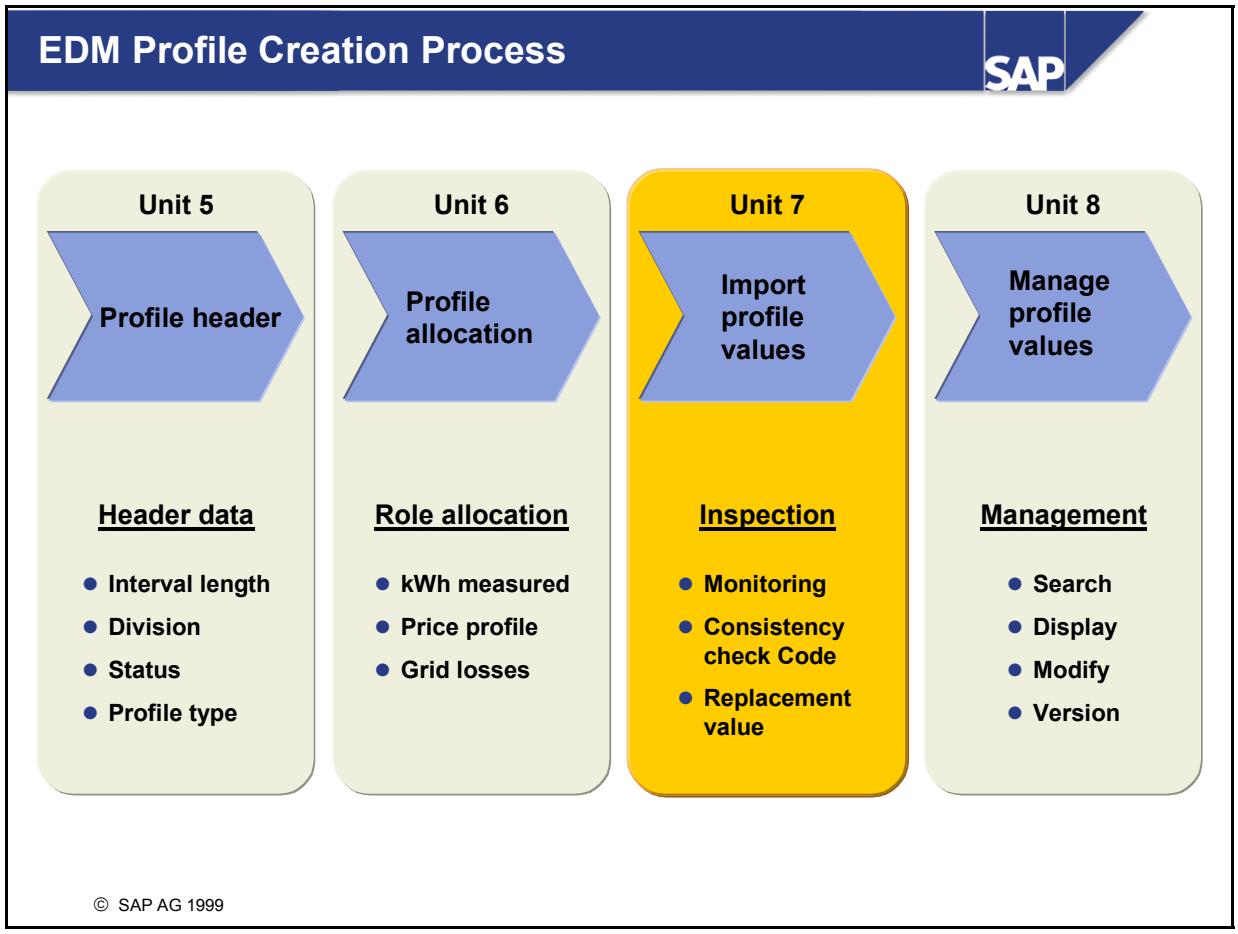
Import Profile Values: Unit Objectives

At the conclusion of this unit, you will be able to:

- **Explain the import interfaces of profile values via IDoc and BAPI interfaces**
- **Import profile values**
- **Operate the import monitoring function.**
- **Explain the consistency checks**
- **Use the possibilities provided by replacement value creation**





- The profile creation process within EDM is described in Units 5, 6, 7 and 8 of the IUT225 course.
- The first step in this process is creating the profile header. This was discussed in Unit 5 – Profile Header. The second step, profile allocation, was described in Unit 6.
- Once the profile has been created (via the create profile header process) and allocated to an object within the system (via the allocate profile process), the profile values must be imported into the system.

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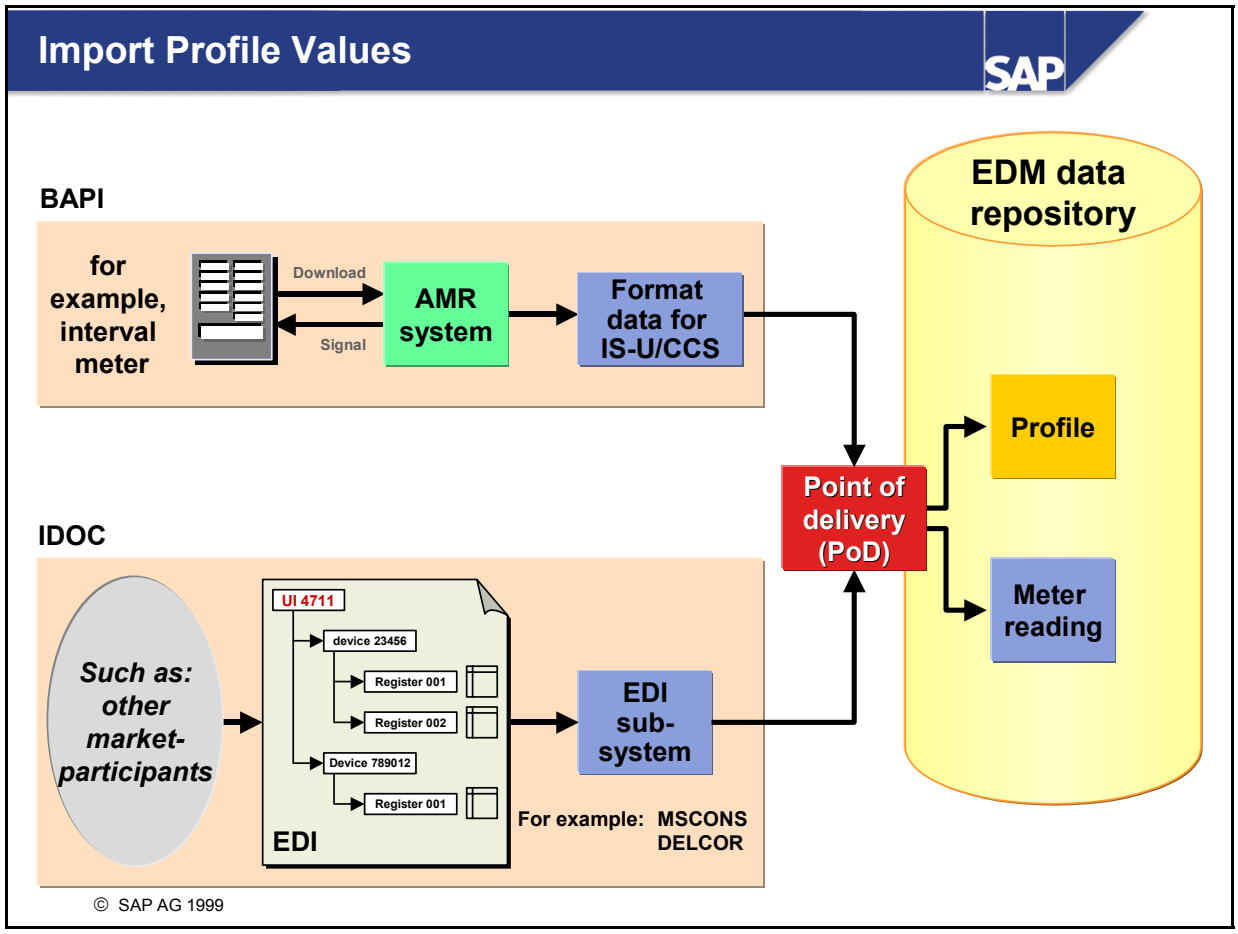

- Profile values can be imported using two procedures
  - BAPIs (*Business Application Programming Interface*): Importing measurement data via a synchronous communication path (for example, a function call such as RFC).
  - Idocs (*Intermediate Document*): Importing data via an asynchronous communication path (for example, electronic data exchange).

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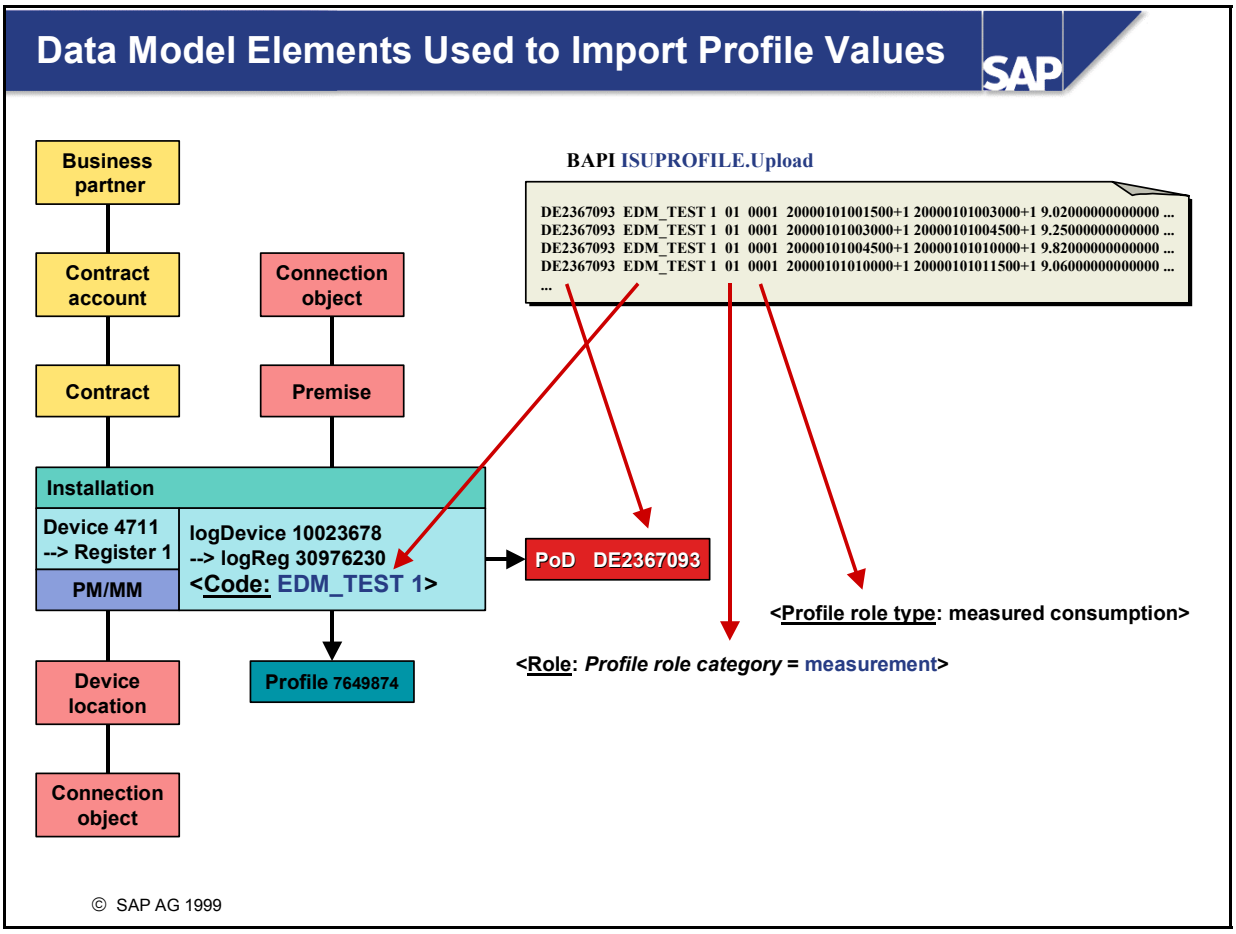

- During data import, registers are identified by the following objects:
  - Point of delivery identification
    - For example, DE2367093
  - Register code
    - For example, EDM_TEST 1
  - Role category of a profile allocation
    - For example, measurement (=01)
  - Role of a profile allocation
    - For example, consumption measured (=0001)

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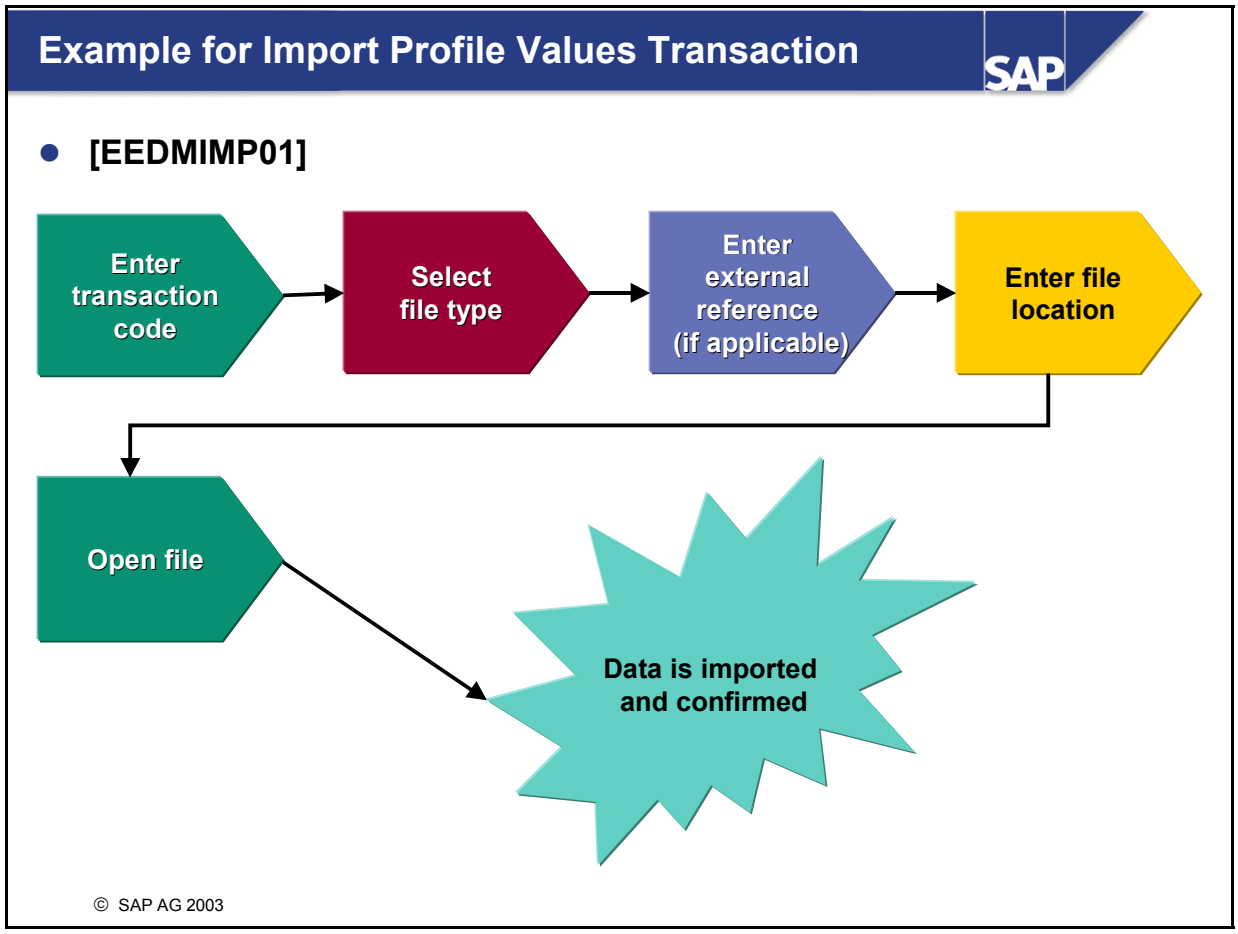

- The transaction code for the Import Profile Values Process is: [EEDMIMP01]
- The following file types are available for profile value import:
  - ASC: ASCII
  - BIN: Binary
  - DBF: DBASE format
  - IBM: ASCII with IBM code page conversion (DOS)
  - WK1: Spreadsheet format
  - DAT: ASCII data table with column tab

  Enter external reference

  Enter the path for the import file
- Once the import process is complete, you can view the import status using a transaction. A message is sent informing the user whether or not the import was successful. For more information about the import, choose the "Monitor Profile Import" transaction. Use the path *Utilities -> Energy Data Management -> Monitoring -> Profile Value Import* [EDM1].

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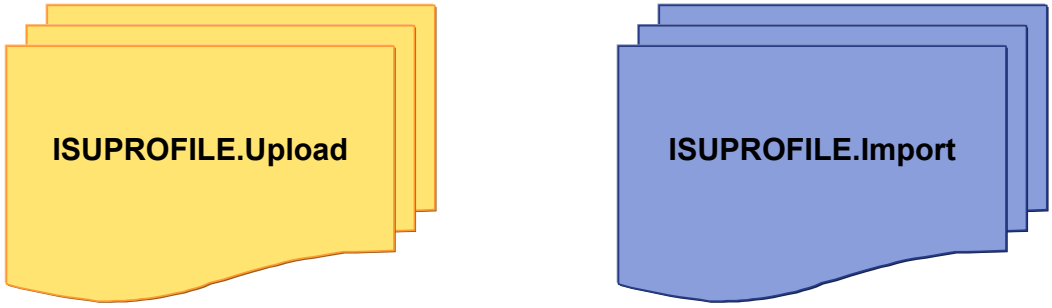
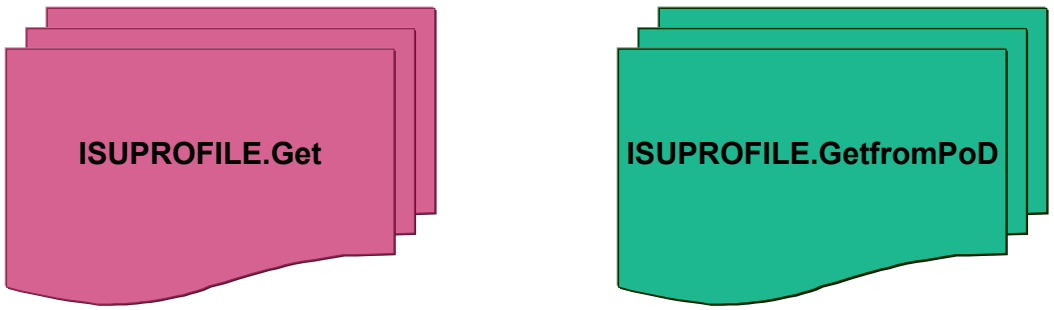
Import Profile Values Using a BAPI



- ISUPROFILE. Upload
  - You can import the profile values using this BAPI.
- ISUPROFILE. Import
  - You can also import profile values using this BAPI.
  - You can also specify the role and the role category to register determination.

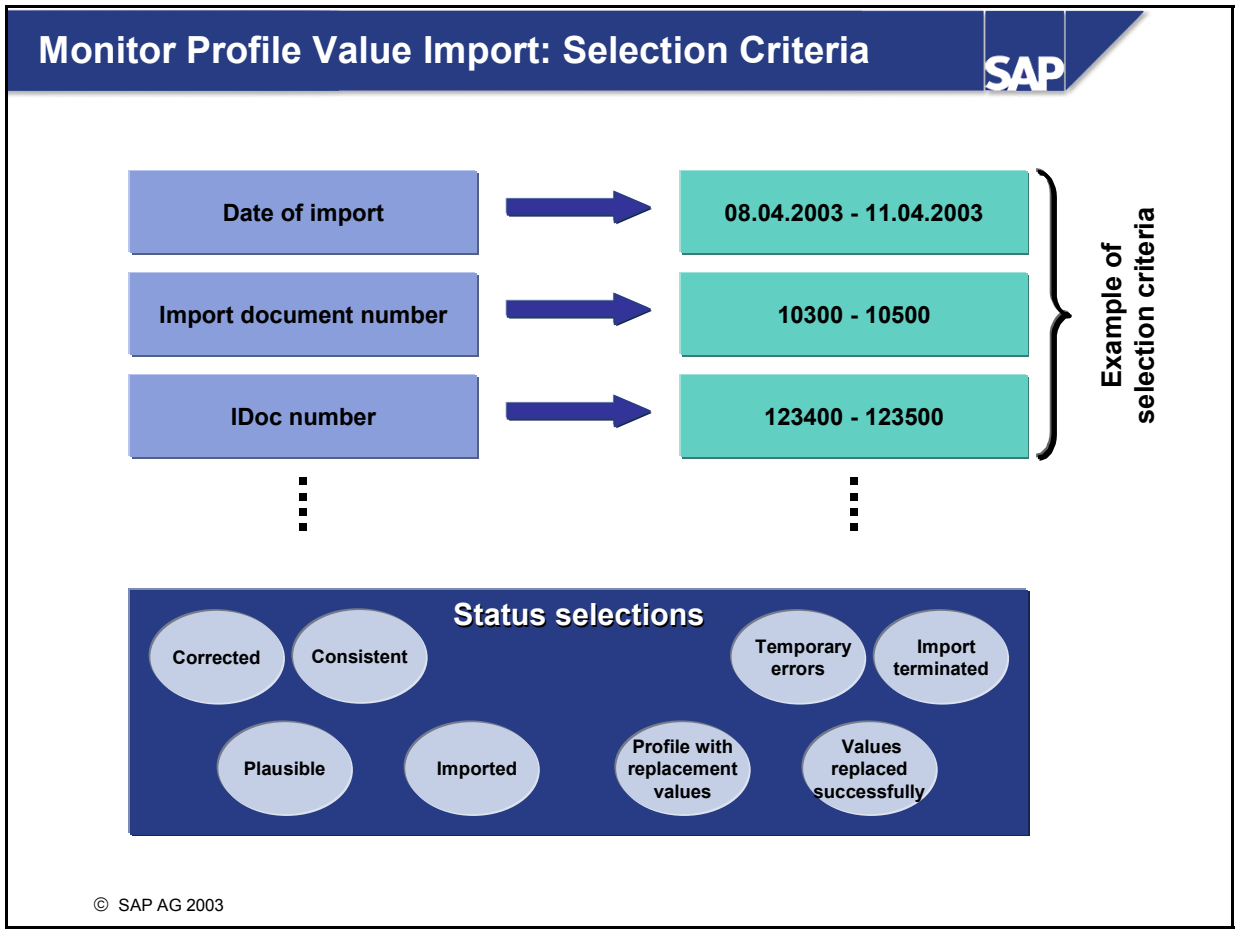
Export Profile Values Using a BAPI



- ISUPROFILE.Get
  - You can export profile values from the Energy Data Repository using this BAPI.
- ISUPROFILE.GetfromPoD
  - You can also export profile values from the Energy Data Repository using this BAPI. Here though, you can specify additional selection categories such as point of delivery, point of delivery ID, role and role category.

Import Profile Values: Import Monitoring

- Profile Import
- Import Monitoring
- Consistency Checks and Consistency Check Groups
- Replacement Value Procedures (RVP) and RVP Groups



- A import log is created once the import transaction has been completed. To display profile values, go to the Utilities Industry menu and choose *Energy Data Management -> Monitoring -> Import Profile Values* [EDM1].

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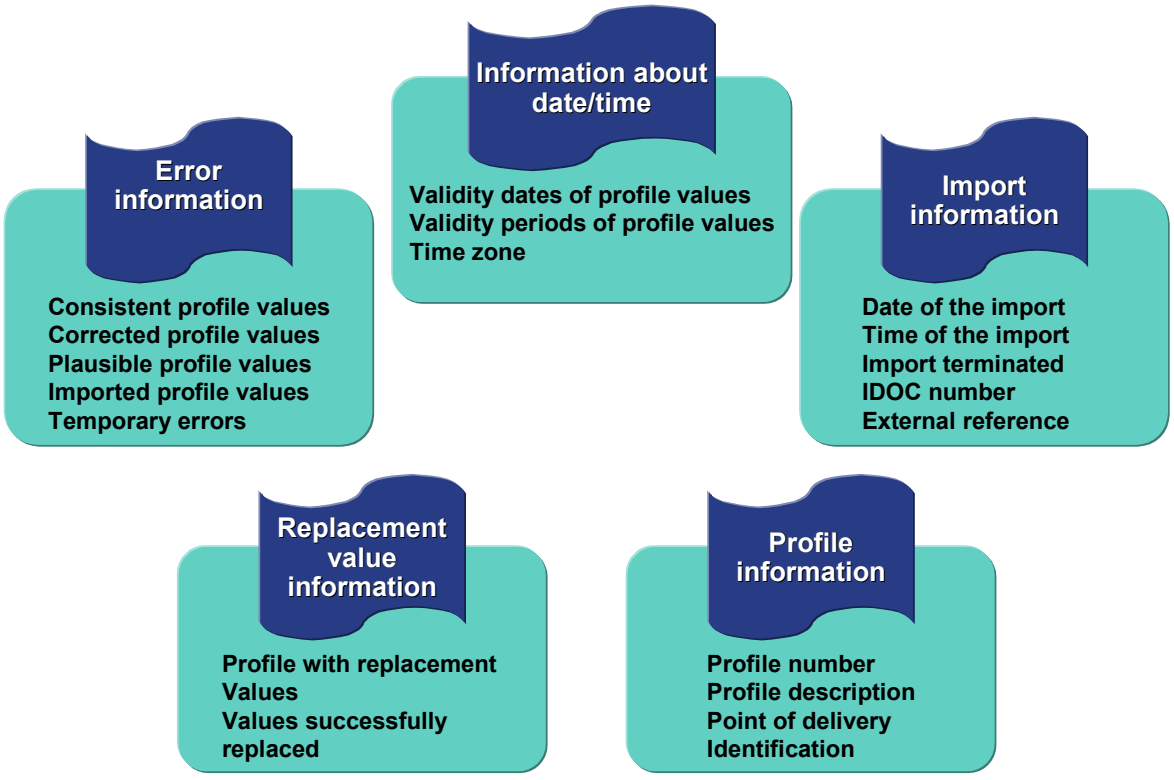
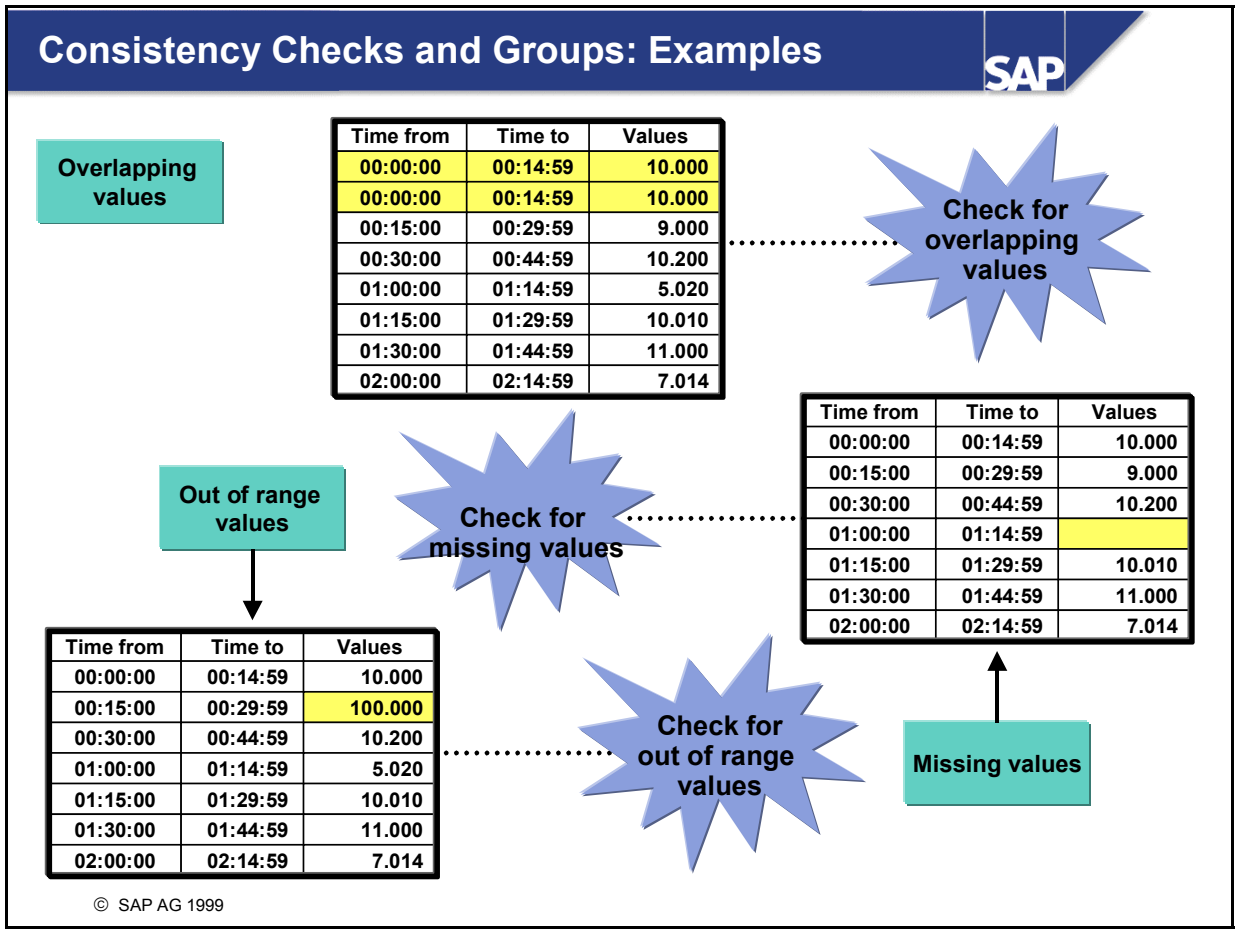
Monitor Profile Value Import: Information

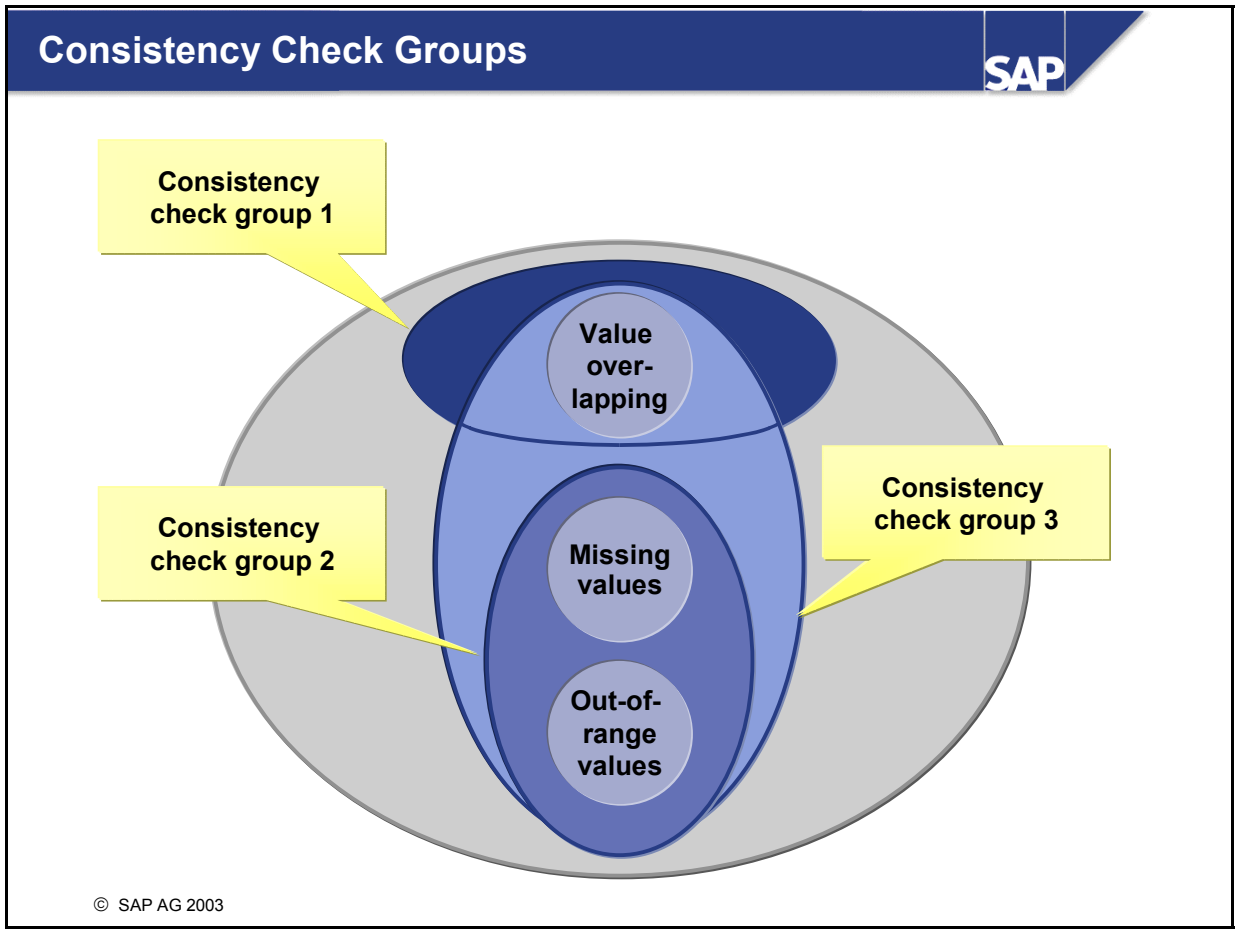


Import Profile Values: Consistency Checks and Consistency Check Groups

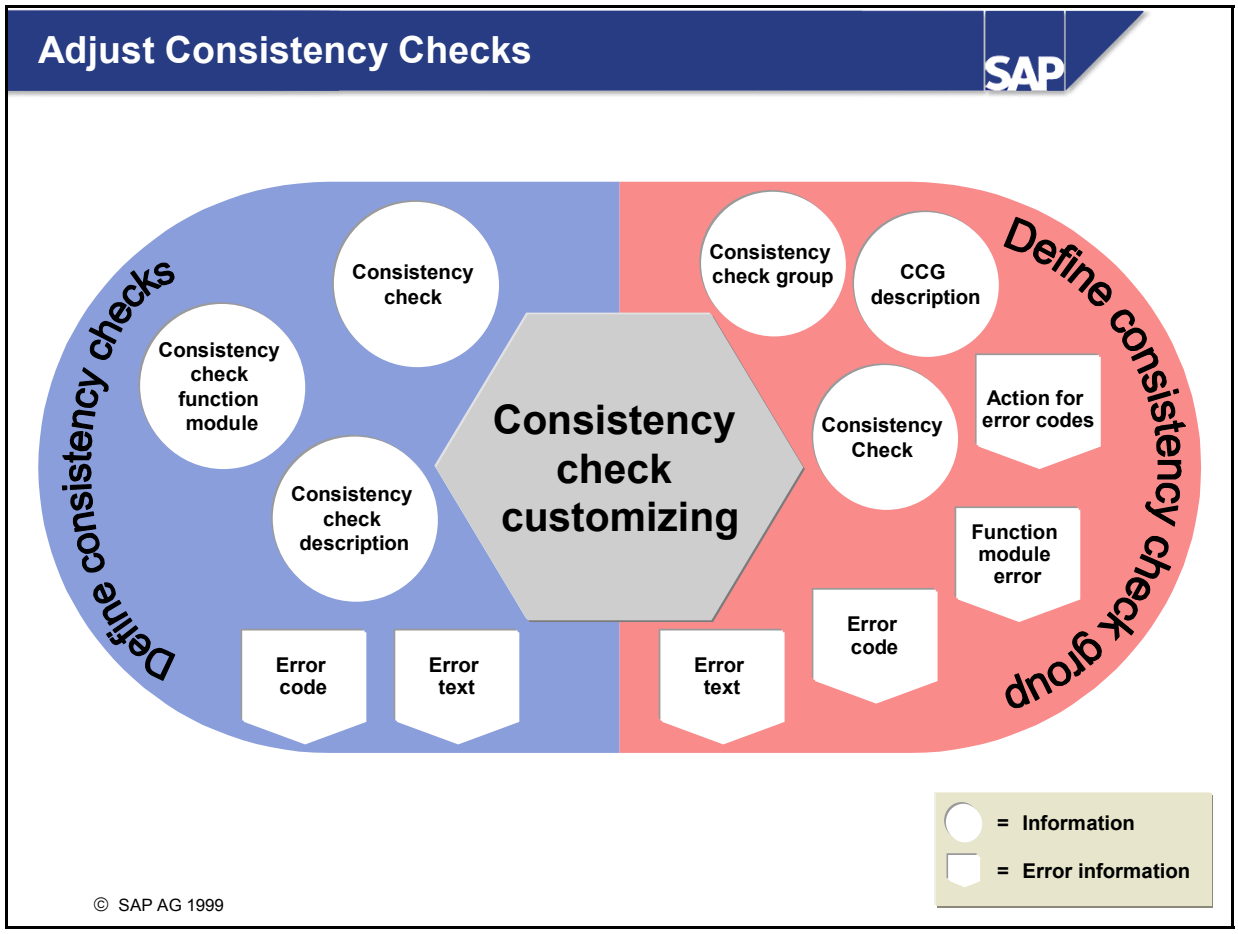
- Profile Import
- Import Monitoring
- Consistency Checks and Consistency Check Groups
- Replacement Value Procedures (RVP) and RVP Groups



- Consistency checks check the profile values as they are imported into the system. Example:
  - Missing and overlapping value consistency checks are allocated to consistency check groups.
  - Consistency check groups are allocated in the profile header (see unit 4).



- The example above shows four consistency check groups to which the following consistency checks are allocated:
  - Consistency check group 1: carries out the following check during profile import:
    - Overlapping Values
  - Consistency check group 2: carries out the following 2 checks during profile import:
    - Missing values, out-of-range values
  - Consistency check group 3: carries out the following 3 checks during profile import:
    - Overlapping values, missing values, out-of-range values



- Customizing path: *-> SAP Utilities -> Energy Data Management -> Interface to External Systems -> Import Check.*
  - *Define consistency checks for profile import*

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Import Profile Values: Replacement Value Procedures (RVP) and RVP Groups

- Profile Import
- Import Monitoring
- Consistency Checks and Consistency Check Groups
- Replacement Value Procedures (RVP) and RVP Groups

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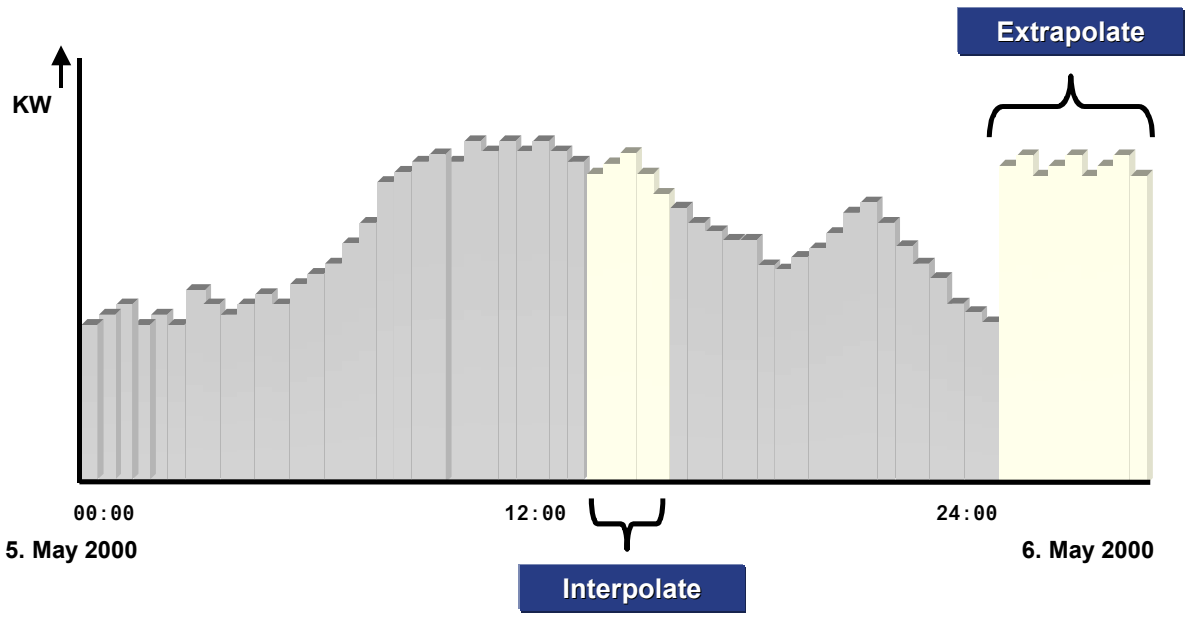
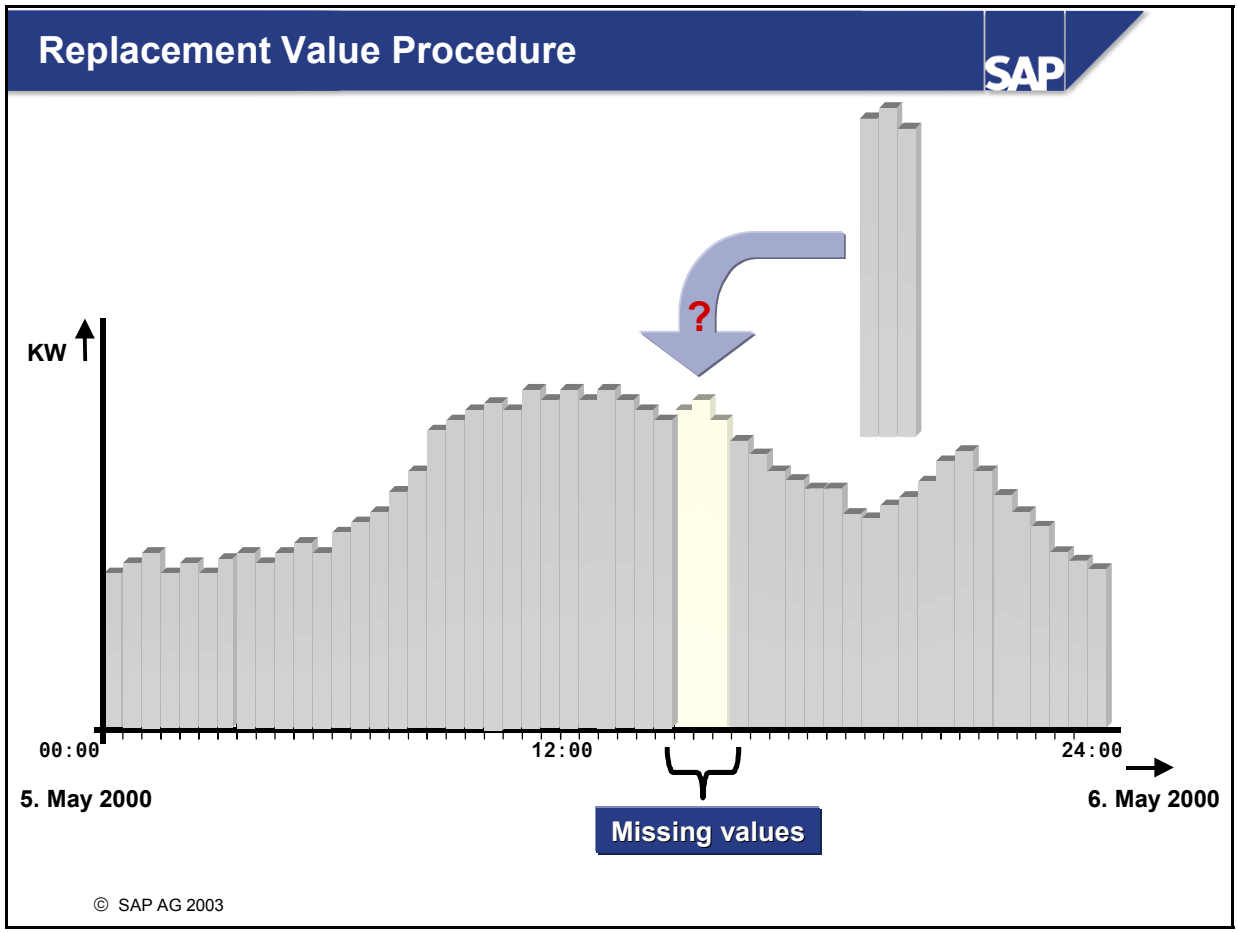
Replacement Values Defined



- The replacement value process creates profile values that are used to replace missing values.
- The replacement value process is used for the following reasons:
  - Profile values do not exist for a certain time period (for example, due to a device breaking down or communication error).
  - To perform billing simulations for future time periods or for the creation of forecast schedules.
- Within Customizing, the replacement value procedures are first of all defined. These replacement value procedures are then assigned to replacement value groups. Replacement value groups are assigned to a profile (in the profile header). This defines the replacement value procedures that are to be used to generate values for the assigned profile.
- The replacement value group can be changed in the profile header after the profile header has been created.
- Only the intervals with missing values are replaced, for example, if some intervals have values and others do not, the existing values are not overwritten.
- It is only possible to generate replacement values for values with the status *value does not exist*. If the value is 0.00 but has a valid status, the value will NOT be replaced.
- It is possible to delete values with the statuses *manually changed/extrapolated/interpolated* using the *Modify Profile Values* transaction, so that replacement values can be regenerated for these intervals.



- Replacement value procedures are defined using the following input parameters:
  - Reference time period
  - Reference profile
  - Reference profile role
  - Historical values: a time period is defined and historical values are taken from this period. These values can come from either a profile that requires values or from another profile (reference profile).
- Error codes are defined for each replacement value procedure. These define all possible errors that can result from the procedures (for example, no historical data in the period required).
- These replacement value procedures are allocated to replacement value groups.

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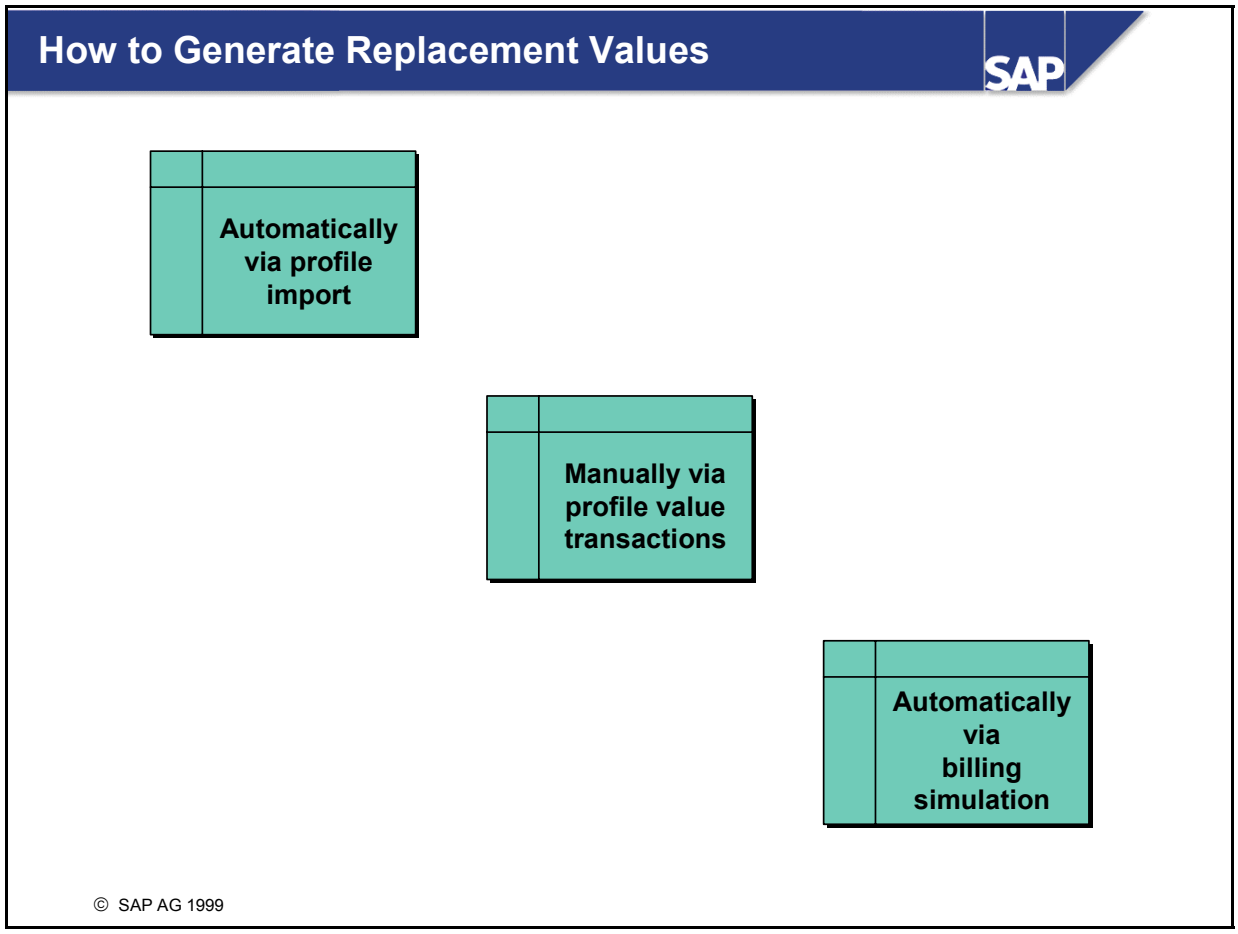

- Replacement values are generated in the following scenarios:
  - Automatic interpolation during value import. You can activate the automatic interpolation of profile values during profile import. The procedures can also be activated from the *Monitor Import of Profile Values* screen (Menu -> *Edit* -> *Generate Replacement Values*).
    - Manual replacement of missing values using the profile values transaction.
    - Interpolation and extrapolation can be executed using *Mass changes* in the profile values transaction.
    - Automatic extrapolation during billing simulation.
    - In the context of IS-U Billing, it is now possible for interval customers to execute a billing simulation based on the extrapolated profile values.
      - Replacement values can only be generated for the profile categories *consumption* or *demand.*

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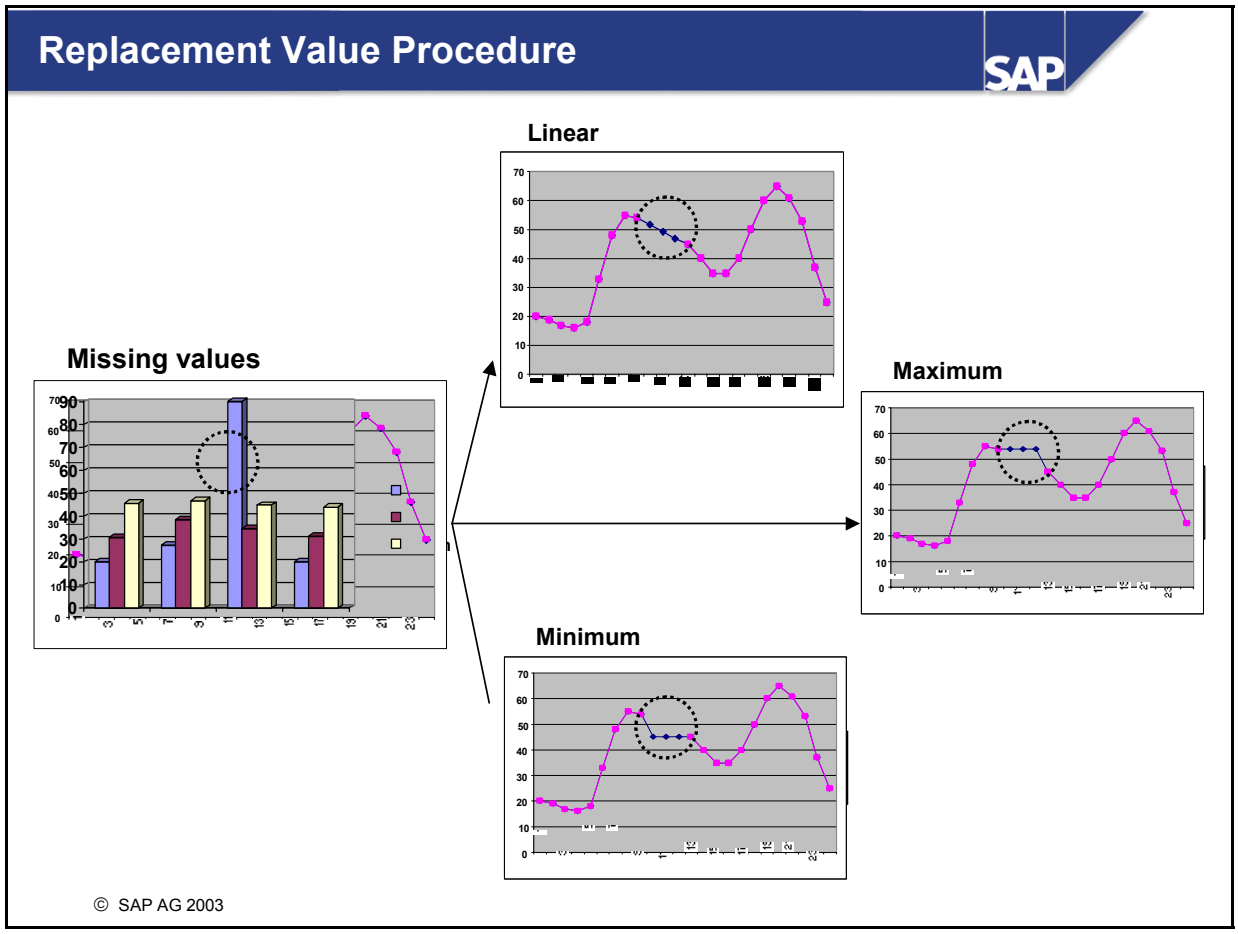
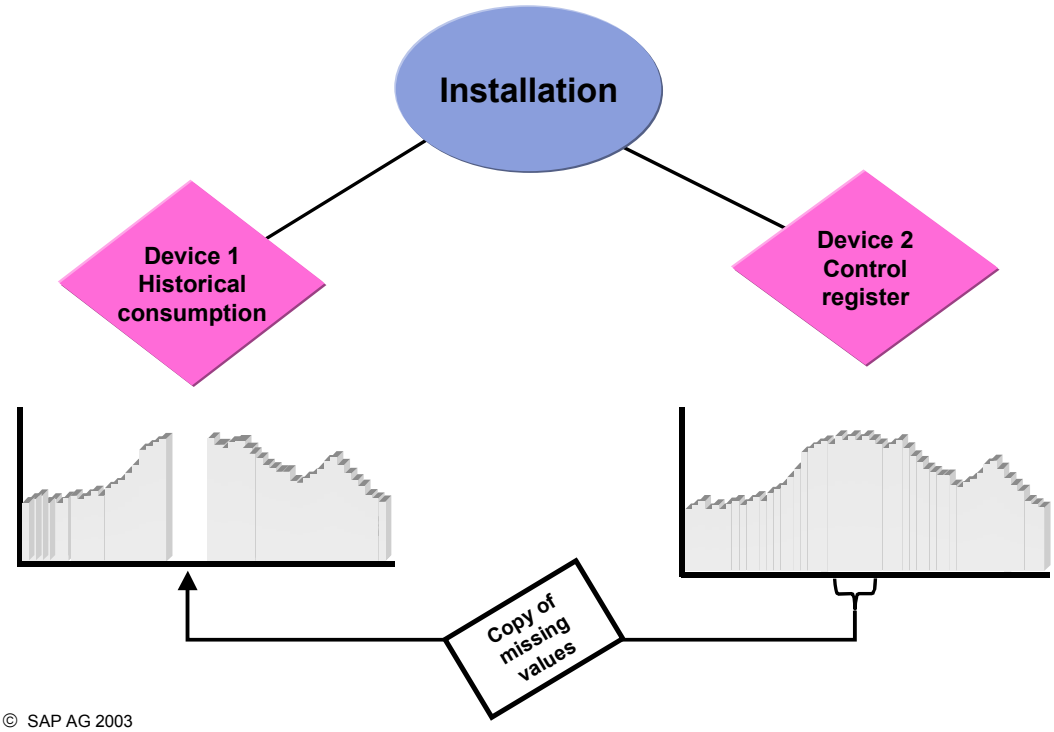


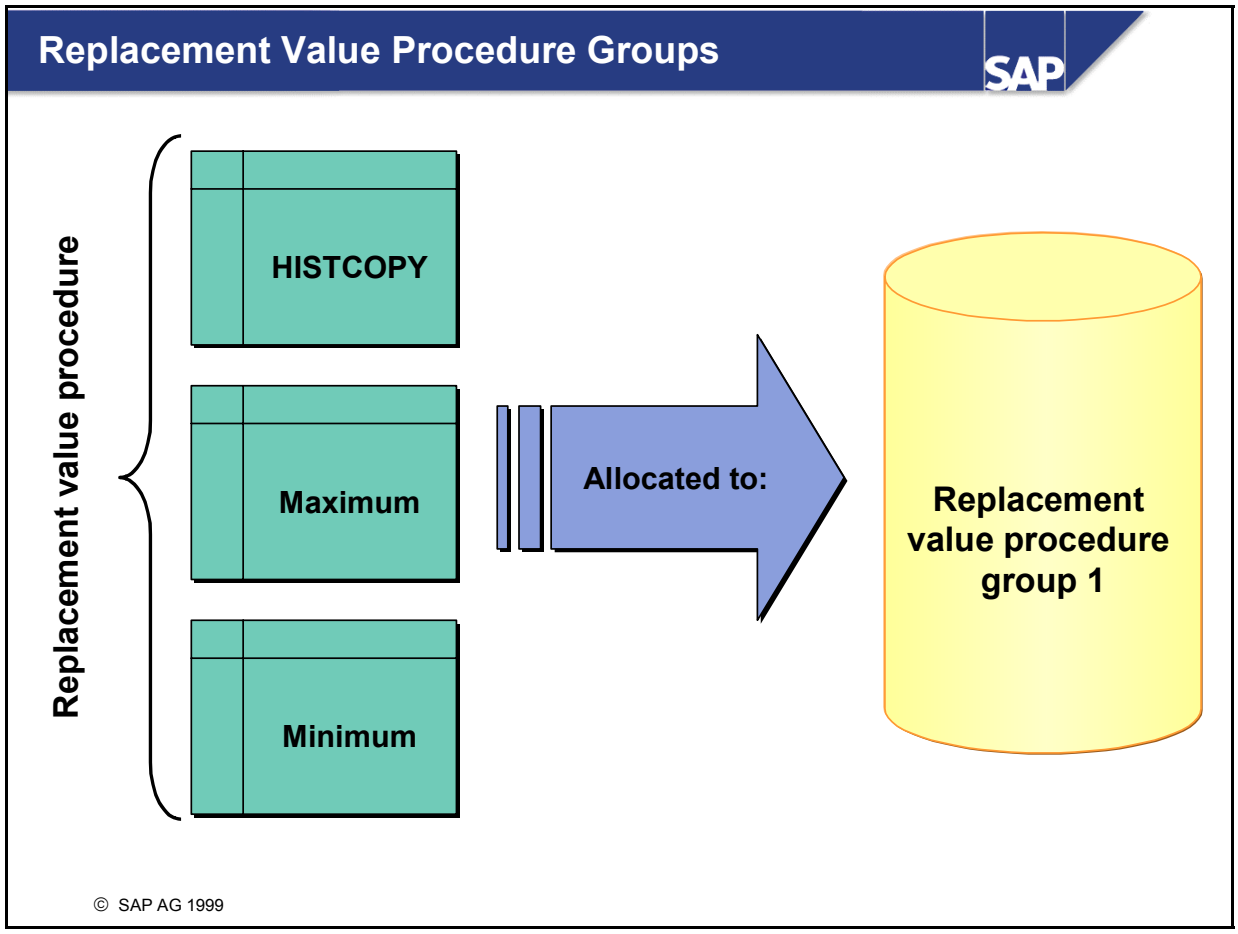
- Seven predefined SAP replacement value procedures can be used: For profiles with only small amounts of data missing, values can be determined from the immediate environment (this means, the value before and after the missing values)
- Linear replacement value procedure: The difference between the last known value before the missing values and the first known value after the missing value is distibuted across the total number of missing intervals.
- Maximum value replacement procedure: The missing values are replaced with the maximum value from the last known value before the missing values and the first known value after the missing values.
- Minimum value replacement procedure: The missing values are replaced with the minimum value from the last known value before the missing values and the first known value after the missing values.

Replacement Value Procedure (Cont.)

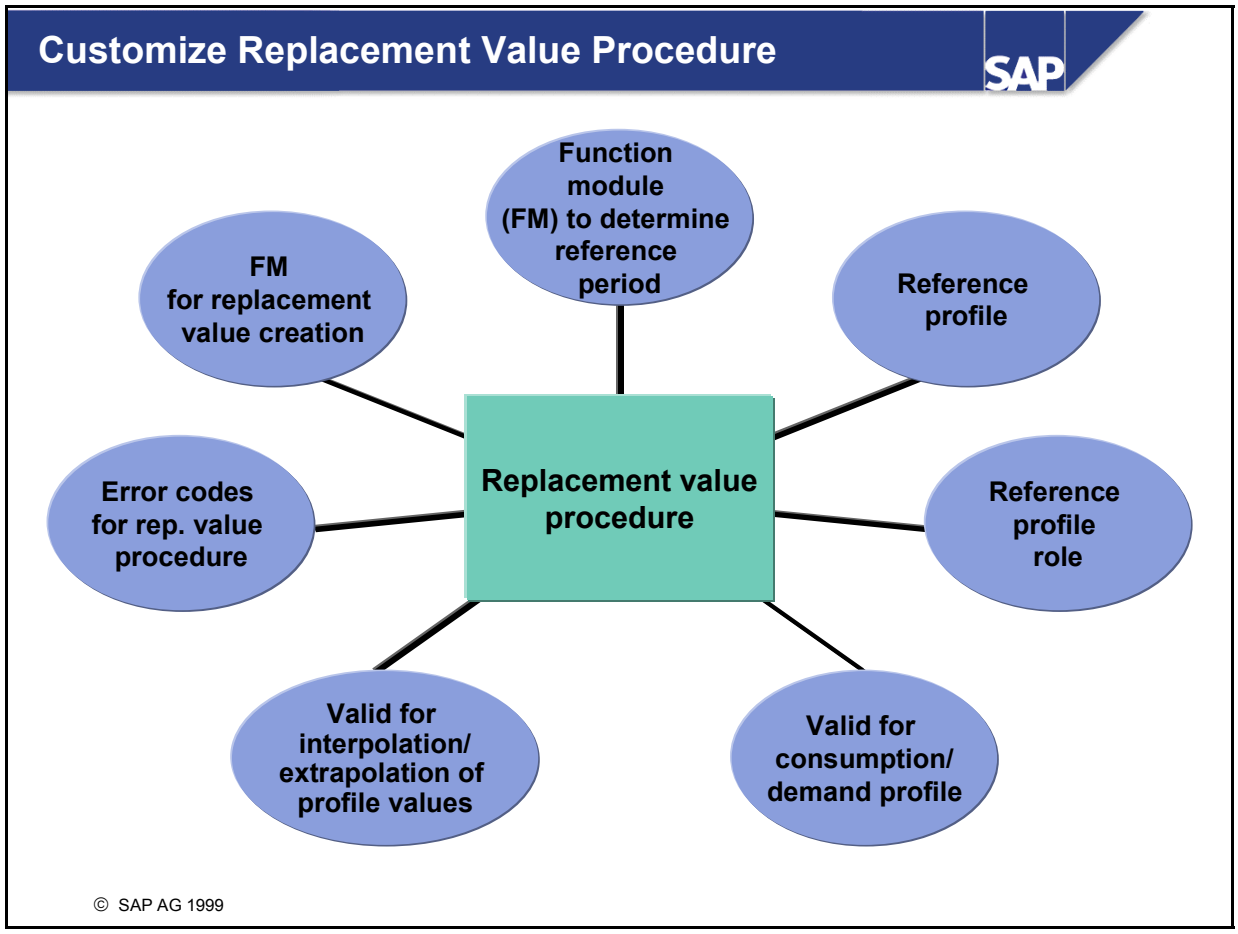
- **CONTROL: Copy values from the profile the of control meter**



■ CONTROL: Copy values from the profile of control meter



- Different replacement value procedures can be allocated to a replacement value procedure group..
- The replacement value procedures in a replacement value procedure group are prioritized, the replacement value procedure with the highest priority is called first. If this replacement value procedure cannot replace the missing values (for example, due to missing environment data/data missing from a control meter), the replacement value procedure with the next highest priority is called.
- The replacement value procedures in a replacement value procedure group are valid for a certain number of missing values.
- If, for example, the number of values to replace lies between 1 and 3, the corresponding replacement values are generated using replacement value procedure x.



- The following parameters define replacement value procedures:
  - *Replacement value procedure* (mandatory)
  - *Function module for replacement value creation* (mandatory): Replacement value procedures are implemented as function modules. Each replacement value procedure is allocated to a function module that executes replacement value creation. All function modules that are entered here must have the same interface as function module ISU_EDM_REP_METH_LINEAR.
  - *Function module for determination of reference period*: This function module is called during the replacement value procedure and determines reference periods for the profile such as seasons, day groups and TOU groups. The function module provided by the customer allocates the profile from the RTP interface to the replacement procedure. An interface is defined in the sample function module: ISU_EDM_REF_TIME_SAMPLE.
  - *Reference profile*: This is a reference profile for the replacement value procedure.
  - *Reference profile role*: This is a reference profile role for the replacement value procedure. You can allocate reference profiles indirectly using roles. At the time of procedure execution, the profile that is allocated to the interval meter with the specified role, is transferred to the replacement values procedure.

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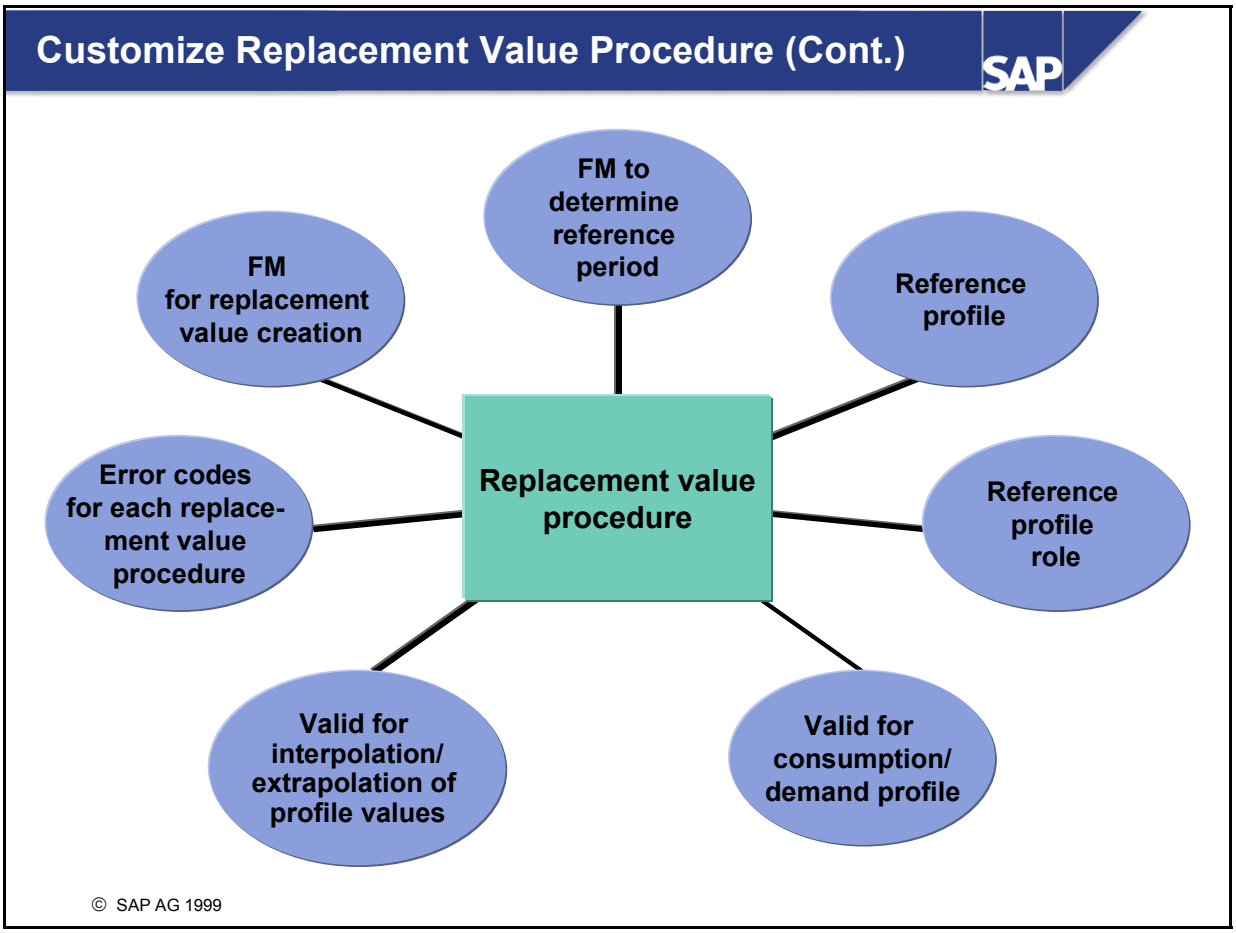
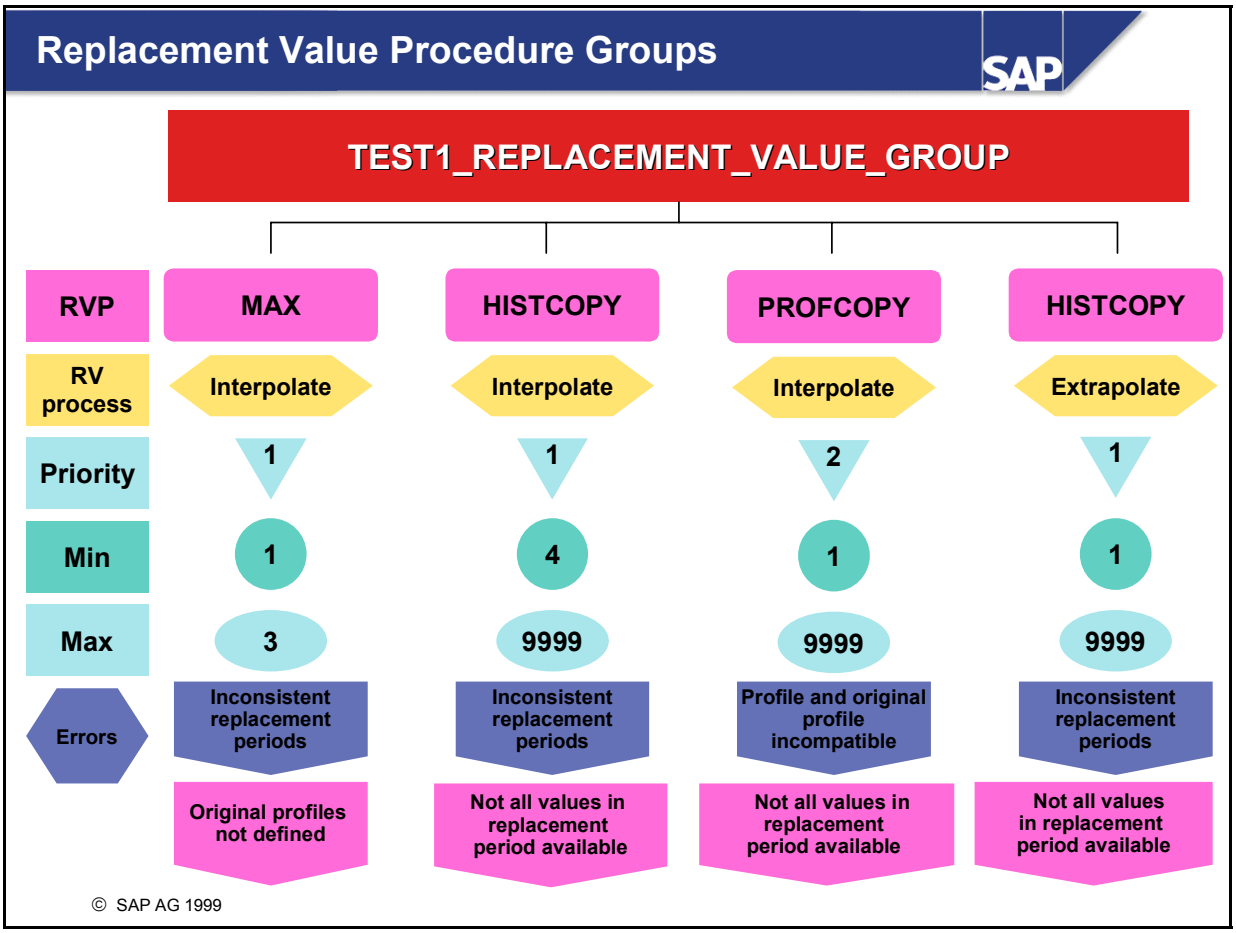
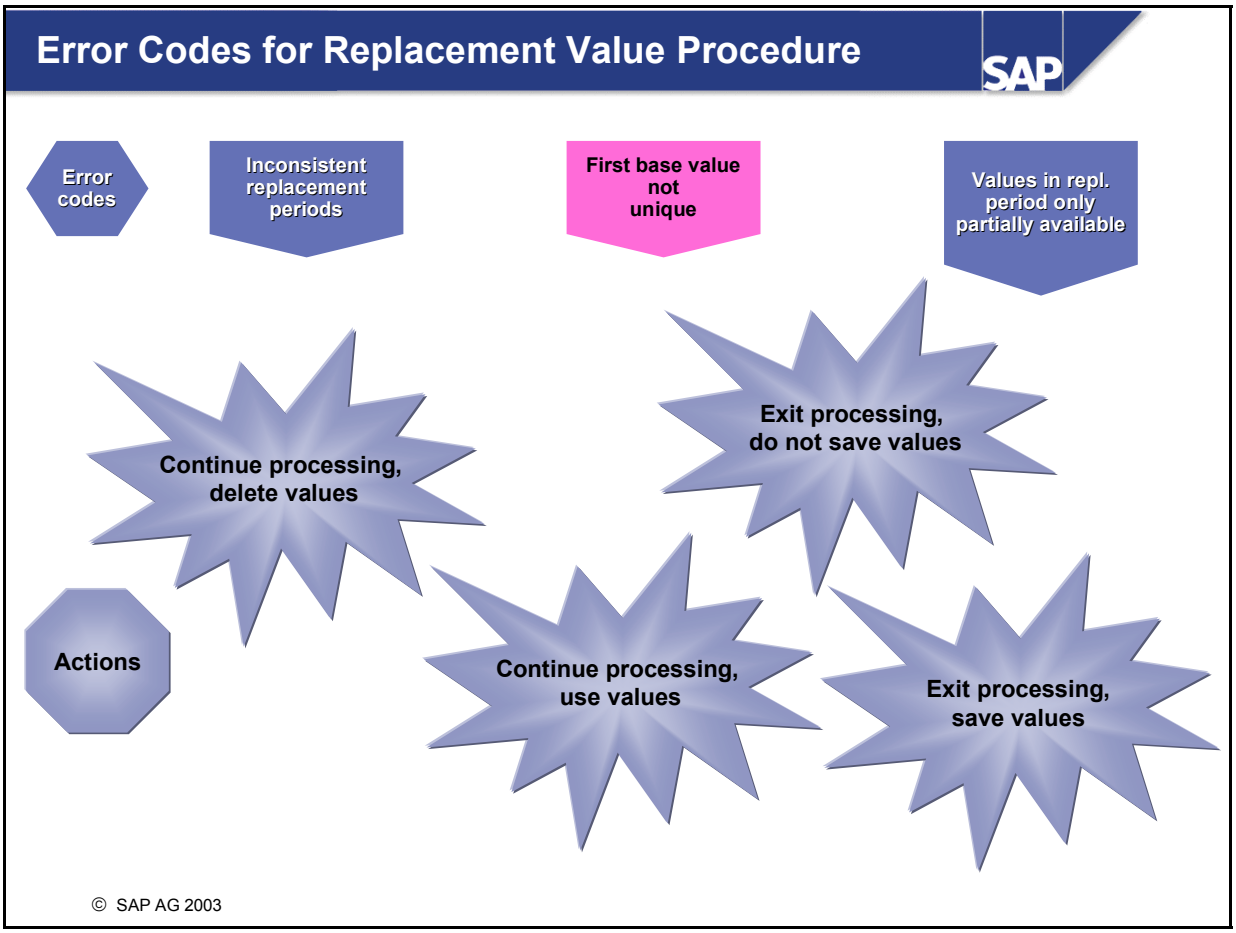


- *Start of reference period*: If the procedure is based on a historical profile, the values used come from the start of this reference period (yesterday, last week, last month, and so on).
- *Duration of reference period*
- *Reference period corresponds to replacement period*: If you select this field, the duration of the reference period corresponds to the duration of the replacement period. If you select this field, entries in the field *Duration of Reference Period* do not take effect.
- *Replacement value procedure valid for consumption/demand profiles*: Every Procedure must be valid for either consumption profiles or demand profiles or both.
- *Procedure valid for interpolation/ extrapolation of profile values*: Every Procedure must be valid for interpolation or extrapolation or both.
- *Manual entries required for replacement value procedure:* If you select this field, this replacement value procedure cannot be used with profile value import or billing simulation.
- *Description of replacement value procedure*
- *Error codes for replacement value procedure: Defines the possible types of error that can occur when replacement values are created.*



- Each replacement value procedure group contains interpolation and/or extrapolation processes. The following parameters define replacement value procedure groups:
  - *Definition of replacement value procedure group*
    - *Replacement value procedure group after profile value import*: The procedure group is automatically called if the system determines that values are missing after a profile value import.
    - *Replacement value procedure group valid for consumption/demand profiles*: Every procedure group must be valid for either consumption profiles or demand profiles or both.
    - Description of replacement value procedure group
  - *Allocation of replacement value procedure to group*
    - *Replacement value process*: Interpolation or extrapolation of profile values
    - *Priority of replacement value procedure(RVP) in RVP group*: This field defines the priority of a replacement value procedure in a replacement value procedure group. The replacement value procedure with the highest priority is always called first.
    - *Minimum/maximum number of values:* Min/Max number of values that can be replaced using values from this procedure.
    - *Replacement value procedure*



- Errors codes are defined for replacement value procedures according to process
  - Description of Error Code for Replacement Value Procedure: This field describes the types of errors that may appear during replacement value creation.
  - *Actions for Error Codes for Replacement Value Procedures.*

    Exit Processing, do not save values

    Exit Processing, save values (this means, save all values – even if only half of the values were generated)

    Continue processing, delete values (should not be used if there are no more procedures because the last known values are always saved and these could potentially all be zero)

    Continue processing, use values (should not be used if there are no more procudures because the last known values are always saved and these could potentially all be zero)

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Exercises

Unit: Import Profile Values

Topic: Import Profile Values

At the conclusion of this exercise, you will be able to:

- Import profile values

Your business partner *TP0101A0##* has a measured load shape for the period January to April 2001. You must import these values to your profile and monitor the profile value import.

After this, you must create a forecast profile and import forecast values for the month of June.

Some forecast values are missing. You must create the replacement values manually.

You then import the values for the month of May into the profile that already contains the interval values. The missing values for May are corrected automatically.

Finally, you will use the forecast profile for one day in June for extrapolation.

Note: Before importing profile values you must download the import file to your local hard drive. Follow the steps below to execute this transaction.

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1-1 In order to download the import data, choose the following path in the SAP menu: ***Utilities Industry → Business Master Data → Business Partner → Contract Partner → Display***.

1-1-1 Enter Business Partner *TP0101A0##.* Select *Enter* and in the menu bar choose *Extras* → *Documents*. Display the input file by double clicking on the file name.

Compare the PoD, the unit of measurement, and the register code with the values you made a note of in the *EDM-Relevant Data Objects* exercise.

Field name or data type	**Values**
Point of delivery	
Unit of measurement	
Register code	

Close the file.

Under *Text*, select the file name and choose the *Export Document* icon.

Do this for the following files:
EDM_TRAINING_xx.lst, EDM_Training_xx_RepVal_May.lst, and EDM_Training_xx_Forecast_June.lst.

Note: xx = corresponds to your group number

Select *Enter* in the *Business Document Navigator* dialog box that appears. Make a note of the directory to which you are exporting the files.

1-1-2 Which fields identify the register during the profile value import? Which values are in the file?

Field name	**Value**

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1-2 In the next step, you will import the profile values for January to April 2001 (file EDM_TRAINING_xx.1st). To do this, select the transaction *EEDMIMP01*.

Note: This transaction has been created solely for training and testing the import of profile values.

1-2-1 Deselect the *Use Role* field. The *Use Role* field **must not** be selected. Select file type ASC and enter a description in the *External Reference* field. Make a note of the description:

Choose *Execute* and confirm the dialog box that appears.
Open the file EDM_TRAINING_xx.1st (using F4) in the directory that contains the files exported in the previous exercise. Choose Enter to start the upload. Read the upload log file.

_____

_____

_____

1-2-2 In the SAP menu choose ***Utilities Industry → Energy Data Management → Monitoring → Profile Value Import***. Choose the *Display Import Log* icon.

_____

_____

1-2-3 In the *Monitoring Profile Import* screen, check that your profile values were imported correctly.

_____

_____

_____

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1-3 Not all profile values for a measured profile are available. As a result, replacement values must be created for the profile.

1-3-1 Which methods of replacement value creation do you know?

_____

_____

1-3-2 Create a forecast profile using the following data:

Description:	Forecast profile group ##
Division:	Electricity
Profile type:	*Forecast profile*
RVP group:	*Manual*
Valid from:	*01/01/2001*
Interval length:	*15 Minutes*
Profile value category:	*Quantity*
Decimal places:	*7*
Measurement unit for MR:	kWh

Make a note of the profile number and the description:

Save the profile.

1-3-3 Allocate the profile to the register of business partner *TP0101A0##*. Use the *Consumption forecast* role for the allocation.

_____

_____

1-3-4 Import the forecast consumption values for the month of June 2001 from the file *EDM_Training_xx_Forecast_June.1st*. Ensure that the *Use Role* field **is** selected.

Call up profile value import monitoring and check whether there are any profiles to be corrected.

_____

_____

1-3-5 Correct the profile values for your own profile.

_____

_____

1-4 Replacement values can also be created automatically. To do this, you must use the *Replacement Value Procedure Groups* in the profile.

1-4-1 Where do you define the *Replacement Value Procedure Group* in Customizing? Read the on-line documentation.

_____

_____

1-4-2 Change the profile header definition of your historical profile. Select the replacement value procedure group *EDM Training: Automatic Calculation.* Save the profile header.

_____

_____

1-4-3 Import the measured load shape for the month of May 2001 from the file EDM_Training_xx_RepVal_May.1st. Ensure that the *Use Profile Allocation Role* field **is not** selected.

_____

_____

1-4-4 Call up the profile value import monitoring and check whether there are any profiles to be corrected. Check whether these values have been corrected.

_____

_____

1-4-5 Display the corrected values from the period 05/05/2001. Which values were determined?

_____

_____

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Unit: Import Profile Values

Topic: Import Profile Values

1-1 Proceed as described in the exercise.

1-1-1 Compare the PoD, the unit of measurement, and the register code with the values you made a note of in the *EDM-Relevant Data Objects* exercise.

Field name or data type	Values
Point of delivery	DE 123456 69120 EDM_P_0##
Unit of measurement	kWh
Register code	EDM_TRAINING

Close the file.

Under *Text*, select the file name and choose the *Export Document* icon.

Do this for the following files:
EDM_TRAINING_xx.lst (profile values January to April)
EDM_Training_xx_RepVal_May.lst (Values for the replacement value procedure)
EDM_Training_xx_Forecast_June.lst (values for forecast data).

Note: xx = Corresponds to your group number

Select *Enter* in the *Business Document Navigator* dialog box. Make a note of the directory to which you are exporting the files.

1-1-2 Which fields identify the register during the profile value import? Which values are in the file?

Field name	Value
Point of delivery ID	DE 123456 69120 EDM_P_0##
Register code	EDM_TRAINING
Role category	01 (Measurement)
Role of profile allocation	0001 (Consumption measured)

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1-2

1-2-1 Proceed as described in the exercise.

1-2-2 In the SAP menu choose ***Utilities Industry→ Energy Data Management → Monitoring → Profile Value Import***. Choose the *Display Import Log* icon.

1-2-3 In the *Monitoring Profile Import* screen, check to see if your profile values were imported correctly.

You should see your profile number displayed without any errors.

1-3

1-3-1 Which methods of replacement value creation do you know?

The manual procedure and the automatic procedure.

1-3-2 Create a forecast profile using the data provided in the exercise.

1-3-3 Allocate the profile to the register of business partner *TP0101A0##*. Use the *Consumption forecast* role for the allocation.

1-3-4 Import the forecast consumption values for the month of June 2001 from the file *EDM_Training_xx_Forecast_June.1st*. Ensure that the *Use Role* field **is** selected.

Call up the profile value import monitoring and check whether there are any profiles to be corrected.
In the SAP menu, choose ***Utilities Industry→ Energy Data Management → Monitoring → Profile Value Import or transaction code EDM1***.

Field name	**Values**
Prof. with RVs (Display profiles with replacement values)	Selected

1-3-5 Correct the profile values for your own profile.

Select the profile containing the values to be corrected and choose ***Edit → Generate Replacement Values for Profile***.

1-4-1 Where do you define the *Replacement Value Procedure Group* in Customizing? Read the on-line documentation.

In the SAP Reference IMG, choose ***SAP Utilities → Energy Data Management → Profile Management → Replacement Value Creation → Define Replacement Value Procedure Group***.

1-4-2 Change the profile header definition of your historical profile. Select the replacement value procedure group *EDM Training: Automatic Calculation.* Save the profile header.

1-4-3 Import the measured load shape for the month of May 2001 from the file EDM_Training_xx_RepVal_May.1st. Ensure that the *Use Role* field **is not** selected.

You do this using the transaction *EEDMIMP01*.

1-4-4 Call up the profile value import monitoring and check whether there are any profiles to be corrected. Check whether these values have been corrected.

In the SAP menu, choose ***Utilities Industry→ Energy Data Management → Monitoring → Profile Value Import*** or transaction code *EDM1*.

Field name	Values
Prof. with RVs (Display profiles with replacement values)	Selected
Succ. RVC (Display profiles with successfully replaced values)	Selected

1-4-5 Display the corrected values from the period 05/05/2001. Which values were determined?

The value 4.9 was determined. The replacement value procedure group *EDM Training: Replacement Value Group* determines up to three missing values during the maximum procedure. The last value before the missing values and the first value after the missing values are compared, and the higher of the two values (maximum) is used as the replacement value.

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Manage Profile Values: Unit Contents

- Profile Values Search and Presentation
- Changes to Profile Values and Versioning
- OLE Integration

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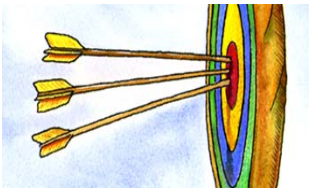
Manage Profile Values: Unit Objectives

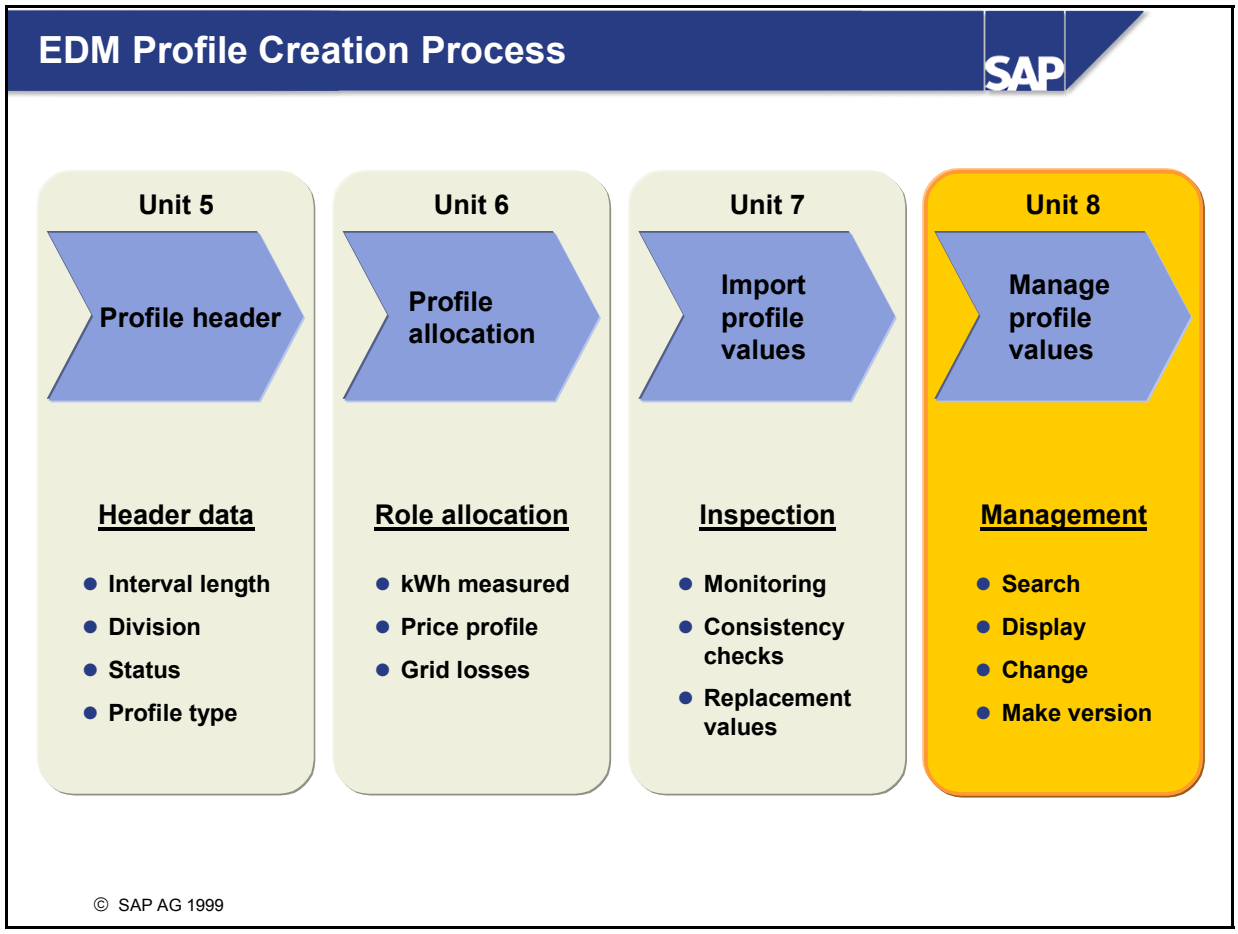
At the conclusion of this unit, you will be able to:

- **Select profile values**
- **Display profile values**
- **Change profile values**
- **Make versions for profile values**
- **Customize profile value statuses**
- **Use the OLE interface to display and change profile values**
- **Discuss presentation of profile values on the Web**



Manage Profile Values: Select and Display Profile Values

- Select and Display Profile Values
- Change Profile Values and Versioning
- OLE Integration



- The profile creation process within EDM is described in Units 5, 6, 7 and 8 of the IUT225 course.
- The first step is the creation of the profile header. This was discussed in Unit 5 – Profile Header. The second step is Profile Allocation, which was covered in Unit 6 – Profile Allocation. The third step is the Import of Profile Values, which was discussed in Unit 7 – Import Profile Values.
- You can manage the profile values in EDM once you have created the profile header and allocated it to a data object in the system, and once the profile values have been imported.
- In this unit, the Profile Values Management process is discussed. This process tasks such as:
  - Profile values presentation (table or graphical)
  - Modification of profile values
  - Status management
  - Versioning
  - OLE integration (Object Linking and Embedding)

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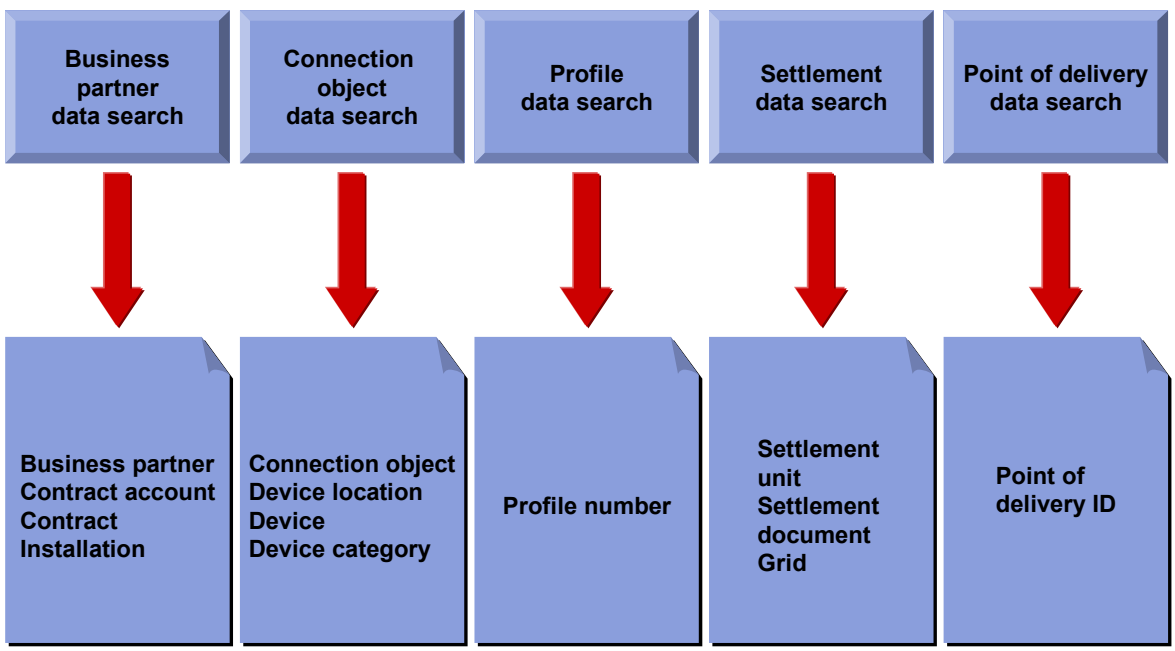
Select Profile Values



- You can select and display profile values using one of the above-mentioned objects.

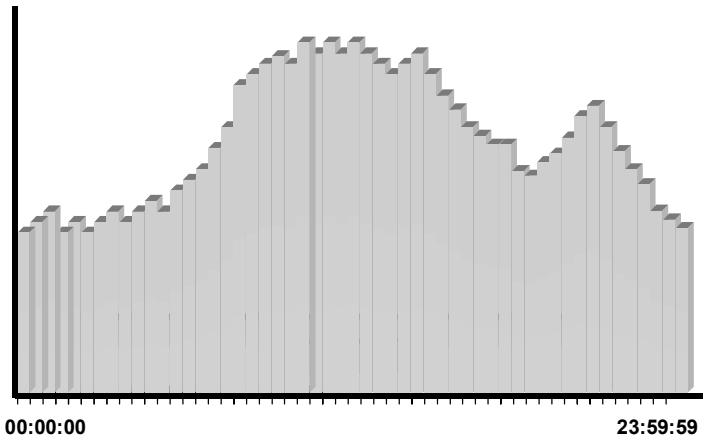
Display and Change Profile Values

Tabular display

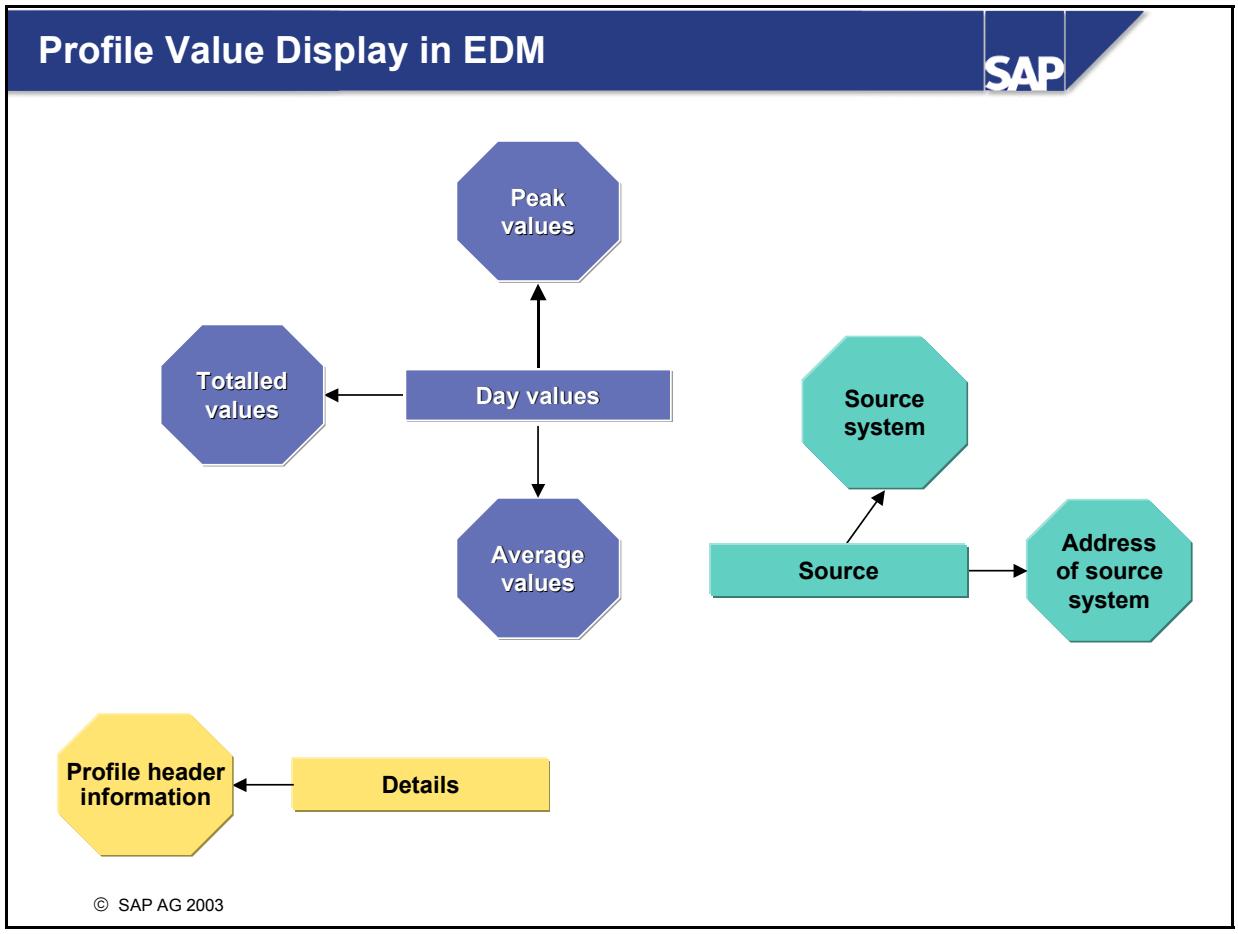
04.04.2000	06:30:00	8.82000
04.04.2000	06:45:00	8.84500
04.04.2000	07:00:00	9.10000
04.04.2000	07:15:00	9.96200
04.04.2000	07:30:00	8.72000
04.04.2000	07:45:00	5.60000
04.04.2000	08:00:00	7.41200
04.04.2000	08:15:00	8.21500
04.04.2000	08:30:00	8.82000
04.04.2000	08:45:00	8.84500
04.04.2000	09:00:00	9.10000
04.04.2000	09:15:00	9.96200
04.04.2000	09:30:00	8.45000

OR

Graphical display



- To access the transactions for displaying and maintaining profile values choose: *Energy Data Management* → *Profile Management* → *Profile Values* → *Display/Change.*
- You can display profile values in table form or as a graphic.
- The changeover to summer-time is taken into account in EDM.
  If profile values are managed in 15 minute intervals, you have the following scenario:
  - In Spring there are 4 fewer time intervals on the day of changeover, because 03:00 directly follows 01:45 (therefore the time intervals 02:00 to 02:45 are missing).
  - In Autumn there are 4 more time intervals on the day of changeover. There are two intervals for 02:00, 02:15, 02:30 and 02:45.
- The changeover to other time zones is also taken into account in EDM.
  The database stores all values in Universal Time Coordinated (UTC). When the local system time is set, for example to GMT, the system displays the UTC time + 1 hour to show the GMT time.



- Once you have selected the profile, three tab pages appear in the work area containing information on the profile header, the profile values and the source of the profile values.

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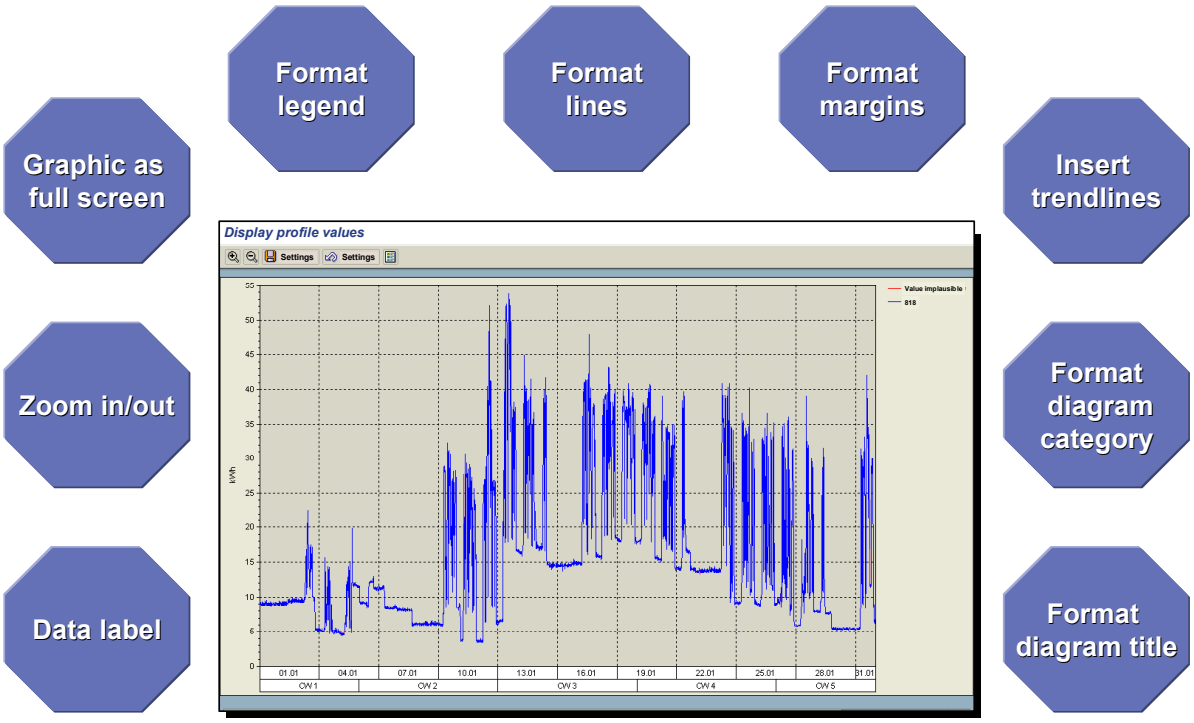
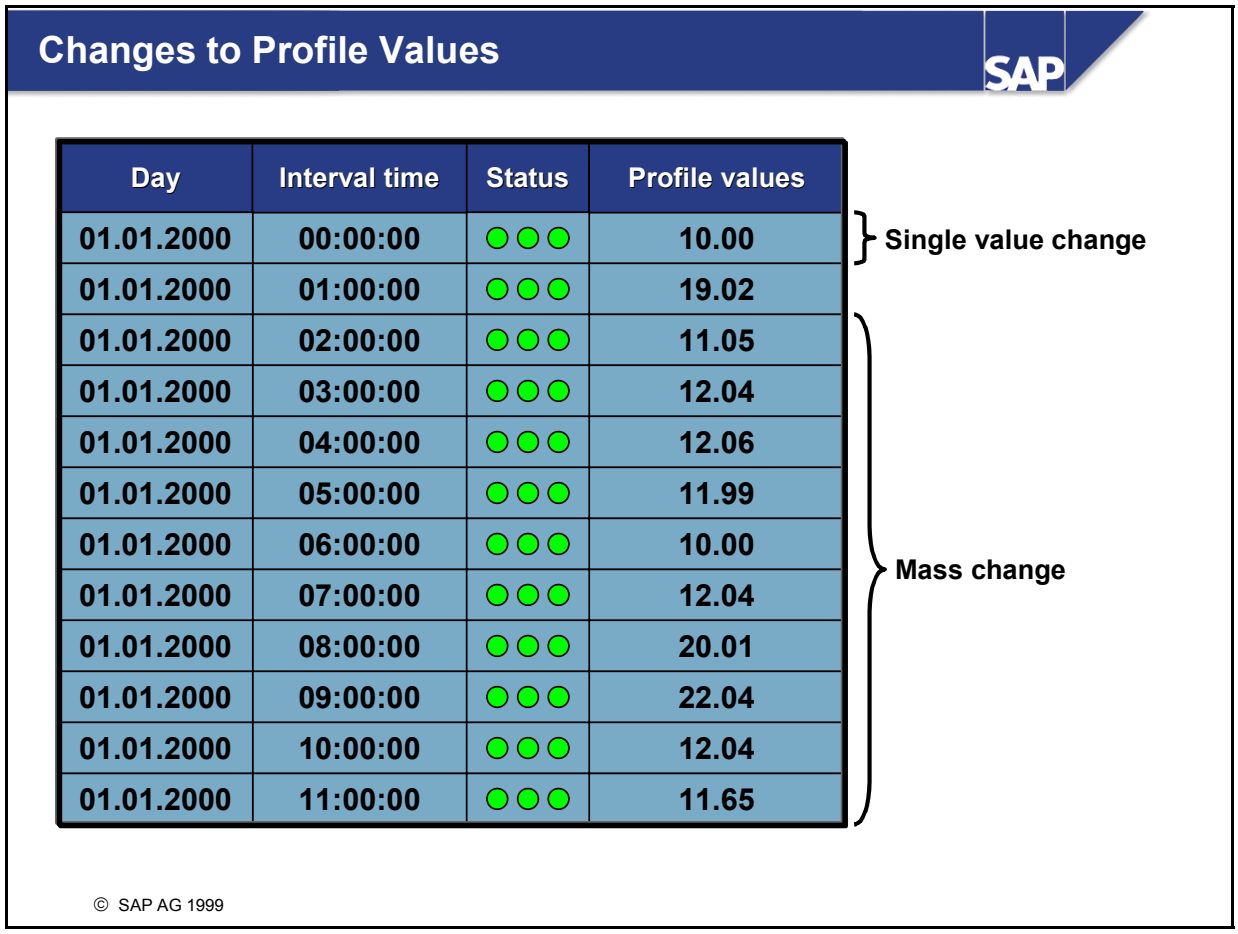
Profile Values Displayed in EDM: Graphical Format



- When you display the profile values in a graphic, there are numerous formatting options. Right mouse click on the graphic to access the different diagram options.

Manage Profile Values: Change Profile Values and Versioning

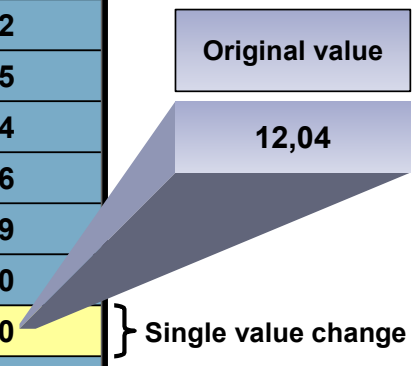
- Select and Display Profile Values
- Change Profile Values and Versioning
- OLE Integration



- To access the *Change Profile Values* transaction in the menu, choose: *Energy Data Management → Profile Management → Profile Values → Change.*
- You can change values in one of two ways:
  - Single value change
  - Mass change

Changes to Profile Values (Single Value Change)

Day	Interval time	Status	Profile values
01.01.2000	00:00:00	○ ○ ○	10.00
01.01.2000	01:00:00	○ ○ ○	19.02
01.01.2000	02:00:00	○ ○ ○	11.05
01.01.2000	03:00:00	○ ○ ○	12.04
01.01.2000	04:00:00	○ ○ ○	12.06
01.01.2000	05:00:00	○ ○ ○	11.99
01.01.2000	06:00:00	○ ○ ○	10.00
01.01.2000	07:00:00	△ △ △	15.00
01.01.2000	08:00:00	○ ○ ○	20.01
01.01.2000	09:00:00	○ ○ ○	22.04
01.01.2000	10:00:00	○ ○ ○	12.04
01.01.2000	11:00:00	○ ○ ○	11.65



- In this example, the profile value on 01.01.2000 was changed manually from 12.05 to 15.00.
- In doing so the status of the profile value has changed. The new status specifies that the values was changed manually.

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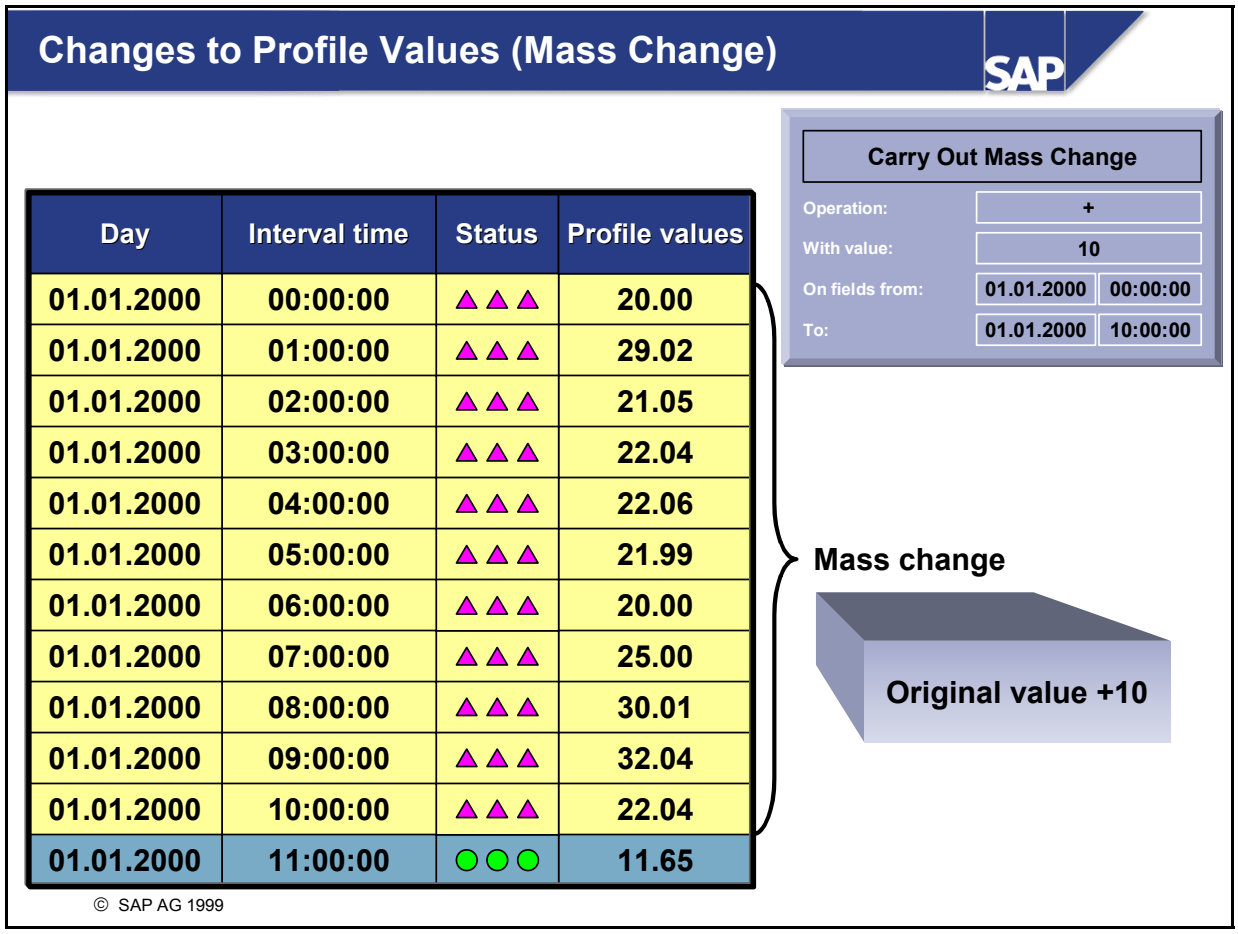

- In the *Carry Out Mass Change* transaction, you can change several profile values at once by making the following settings:
  - *Operation*:
    - Add, subtract, multiply, divide, replace
    - Delete Values, Protect Values, Undo Value Protect, Lock Values, Release Values, Interpolate Values, Extrapolate Values
  - *With value:* Enter the value here that must be used to carry out the mathematical operation (for example, add value x to the previous profile values or multiply the previous profile values by value x).
  - *To values from* and *to:* You enter the period (date and time) here for which the profile values are to be changed.
- In the above example, a mass change took place for the profile values on January 1st 2000 between 00:00:00: and 10:00:00, in which the value 10 was added to each of the original profile values.
- In doing so the status of the profile value has also changed. The new status specifies that the values have been manually changed.

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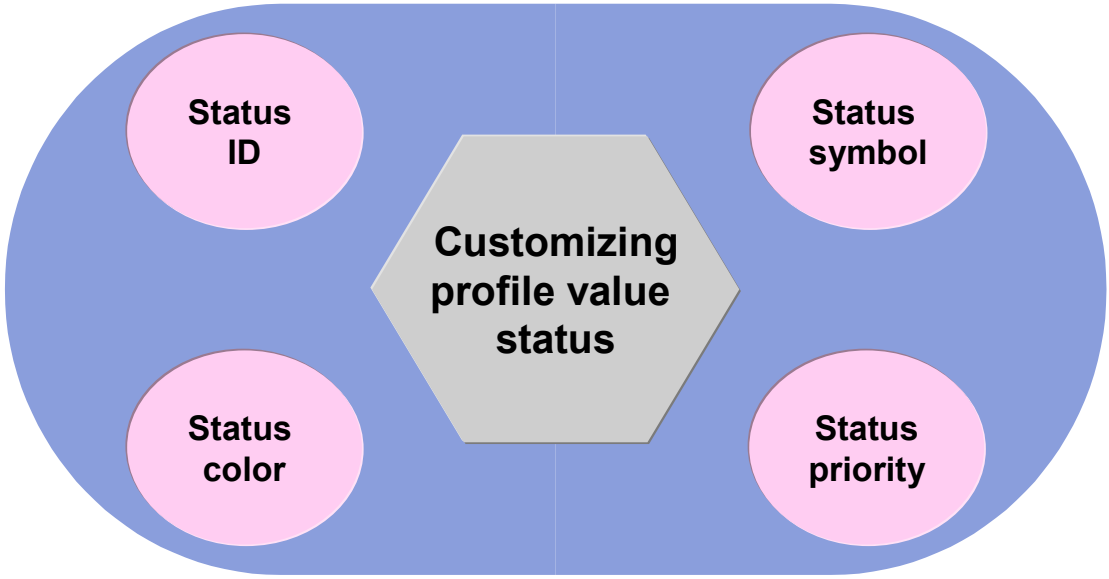
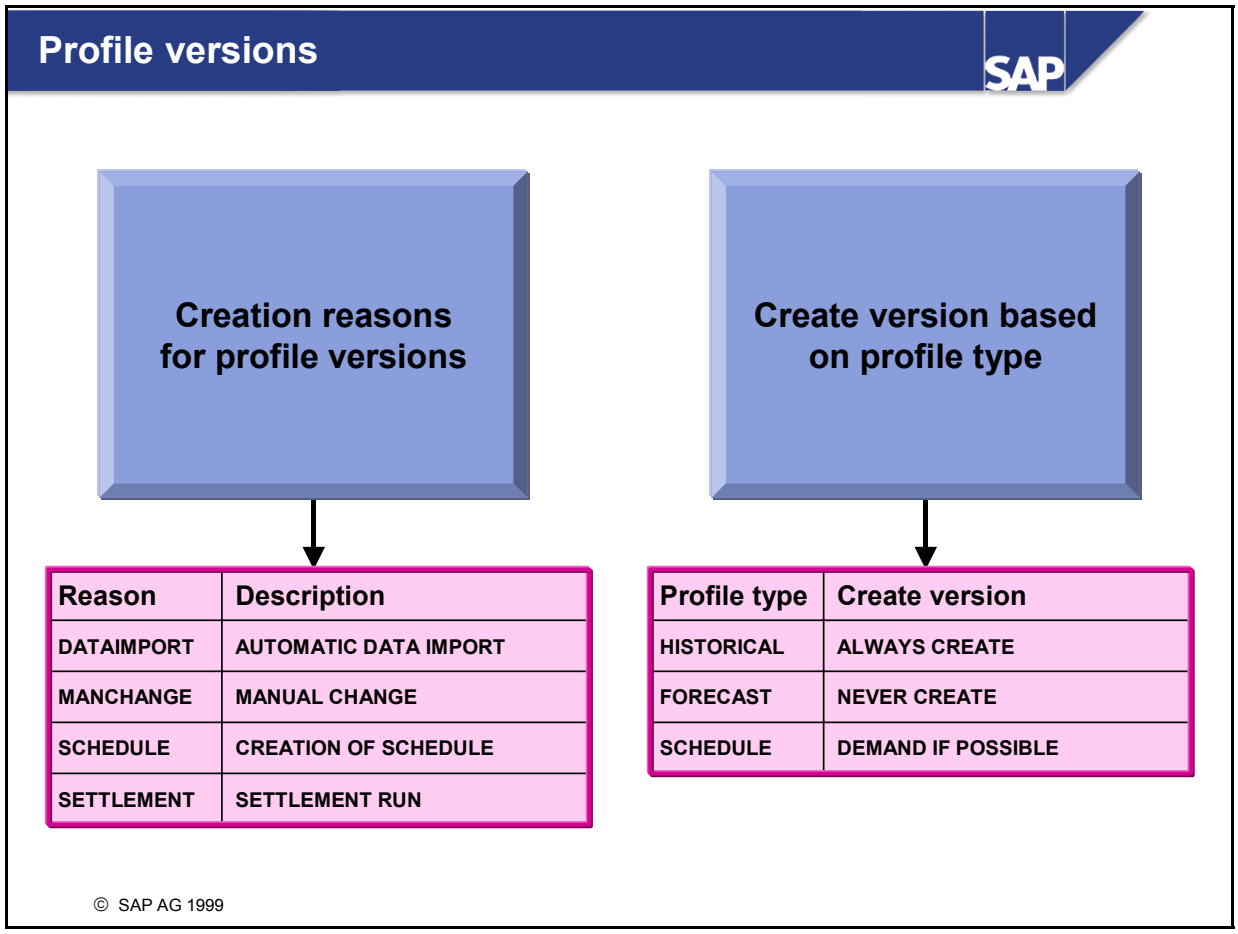
Customizing the Display for Profile Value Status



- You can define how the status of profile values is displayed in tabular and graphical presentation. Make the settings in Customizing under *Energy Data Management → Profile Management → Display Function → Define Status Display for Profile Values*.
- You define the status display using the following parameters:
  - *Status*: ID of the status predefined by SAP.
  - *Status symbol for tabular presentation*: Here you define which symbol is used to display the status of a profile value for tabular presentation. You can use the input help function to selection a symbol, or you can define your own.
  - *Priority of status for tabular and graphical profile presentation:* Here you define which status is displayed when a profile value has more than one status. You can use the input help function to find out the permissible value range for the priority allocation.
  - *Color of status for graphical profile presentation*: Here you define the color in which the status of a profile value is displayed for graphical profile presentation. You can use the input help function to find out the color numbers of the red, green and blue values (RGB values). You can use the input help function to find out the permissible value range for the color number allocation.
- For more information, see the *General Information on Profile Value Display* in Customizing under *Energy Data Management → Profile Management→ Display Function.*



- You can define reasons for creating profile versions.
  To do this you must make the settings in Customizing under *Energy Data Management → Profile Management → Profile Versions → Define Creation Reasons for Profile Versions.*
- You can also define the creation of a version based on the profile type. You can determine, for example, that if the values of an elementary profile type are changed, then a version is always created, and if the values of an historical profile type are changed, then a version is never created.
  To do this you must make the settings in Customizing under *Energy Data Management → Profile Management → Profile Versions → Define Creation of Profile Version.*
  Diese Einstellungen kommen nur bei der manuellen ¾nderung von Profilwerten über die Transaktion *Profilwerte ¿ndern* zum Tragen.

Profile Versions

Day	Interval time	Status	Profile values	Status	Profile version
01.01.2000	00:00:00	▲▲▲	10.00	●●●	20.00
01.01.2000	01:00:00	▲▲▲	19.02	●●●	29.02
01.01.2000	02:00:00	▲▲▲	11.05	●●●	21.05
01.01.2000	03:00:00	▲▲▲	12.04	●●●	22.04
01.01.2000	04:00:00	▲▲▲	12.06	●●●	22.06
01.01.2000	05:00:00	▲▲▲	11.99	●●●	21.99
01.01.2000	06:00:00	▲▲▲	10.00	●●●	20.00
01.01.2000	07:00:00	▲▲▲	15.00	●●●	25.00
01.01.2000	08:00:00	▲▲▲	20.01	●●●	30.01
01.01.2000	09:00:00	▲▲▲	22.04	●●●	32.04
01.01.2000	10:00:00	▲▲▲	12.04	●●●	22.04
01.01.2000	11:00:00	●●●	11.65	●●●	11.65

Versioned values

- If versions of profile values exist, you can display them using the *Display/Change Profile Values* transactions. In doing so, you can display several versions in parallel.
- You can delete versions.

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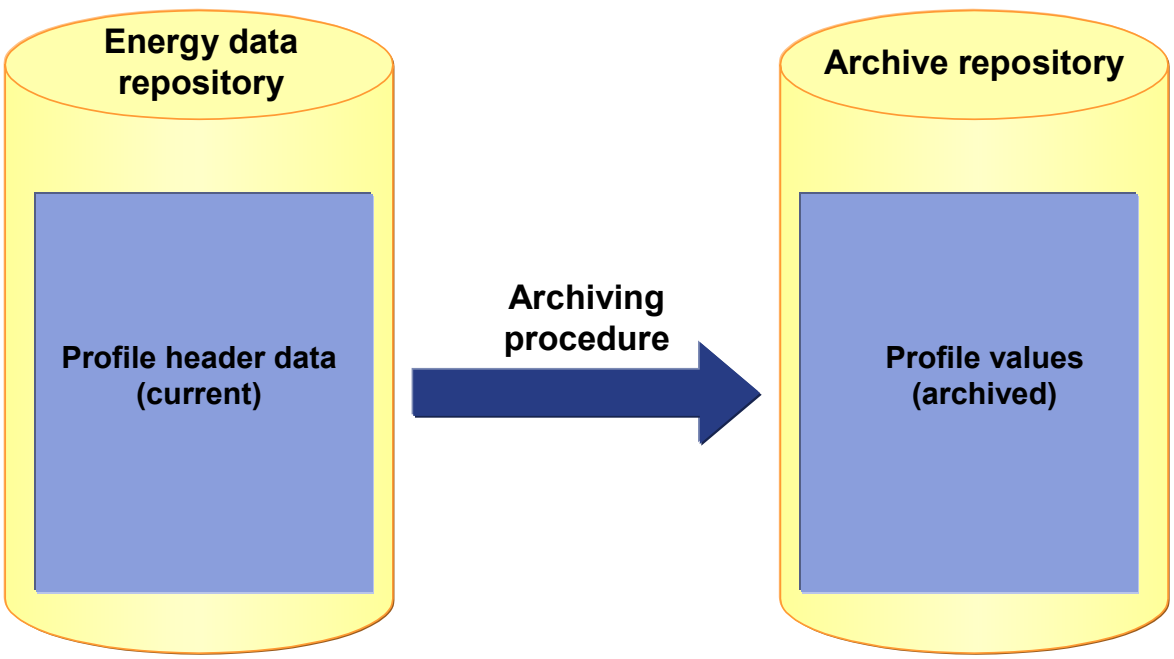
Archiving Profile Values



- You can archive profile values that are no longer required online. Profile values are deleted from the database and written to archive files. You can display the archived values.
- The profile header information remains. On the profile header screen, the last archiving date can be seen.
- Customizing:
  - Before you start the archiving run for the first time, you must first activate the archive information structures for the individual documents (in this case, the document type is *EDM profile values*). You make these settings in Customizing of *SAP Utilities → Tools → Archiving → Activate Info Structure for Archiving*.

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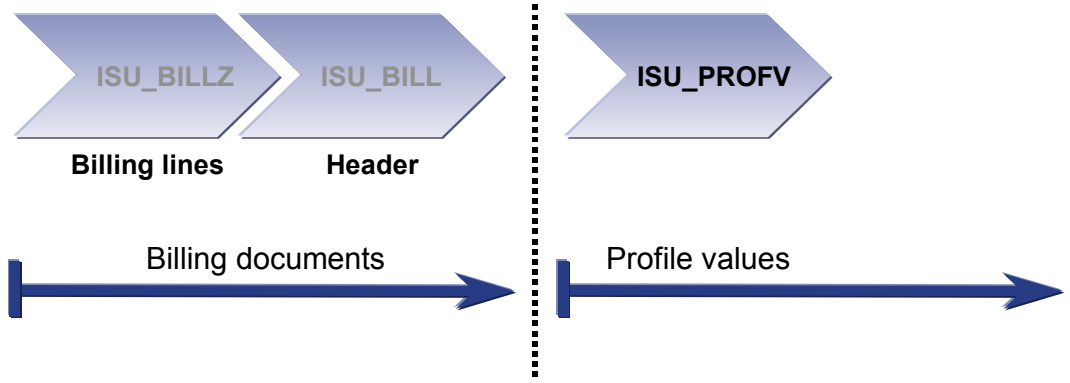
Analysis of Archivability of Profile Values

Archiving period

Defined via a retention-period in the Customizing for Archiving

Archiving sequence



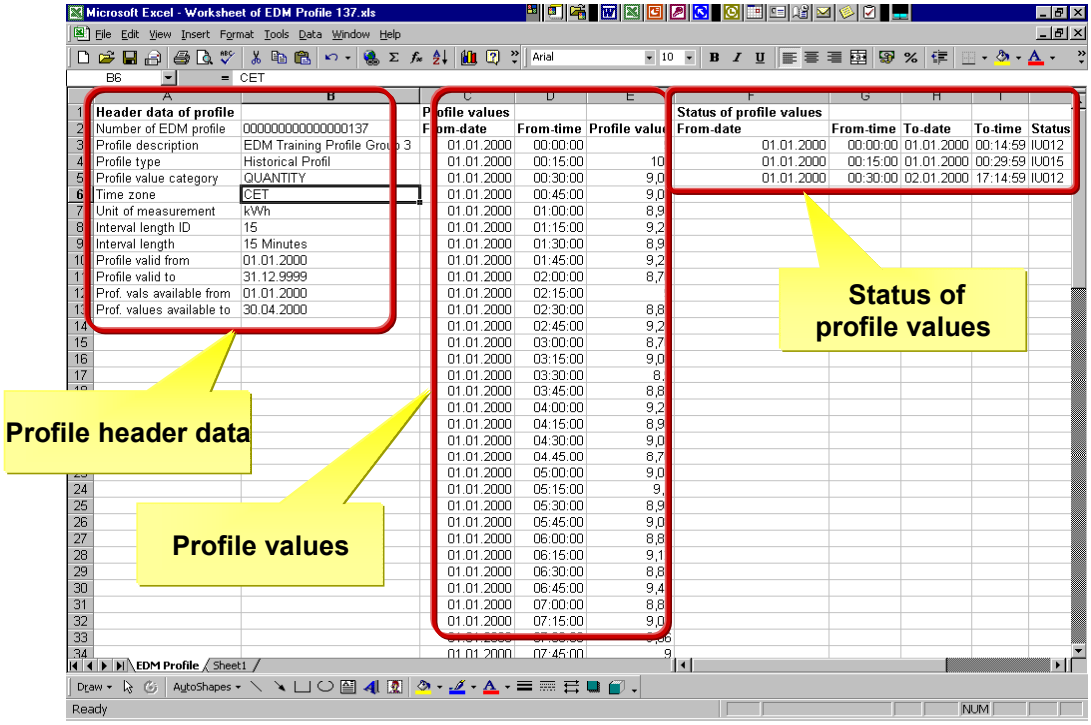
- You want to archive profile values after a certain amount of time (retention period in system). To do this you define the retention period of profile values in Customizing under *SAP Utilities → Tools → Archiving → Define Retention Period for Archiving Objects.*
- Profile values are analyzed to find out whether they can be archived or not. This analysis is as follows:

  1. Profile value selection: First you must enter the period for which the values are to archived.
     Enter a profile value that you want to archive.
  2. Determination of the final date for archiving:
     The system determines the final date for archiving from the retention period defined in days in Customizing. This means that only those documents that are older than the retention period in Customizing can be archived.
     To determine the final date for archiving profile values, the retention period of archiving object ISU_BILL (billing document header) is used. You can only archive the profile values if the billing of the associated installation is complete, and the billing document can no longer be reversed.

Manage Profile Values: OLE Integration

- Select and Display Profile Values
- Change Profile Values and Versioning
- OLE Integration

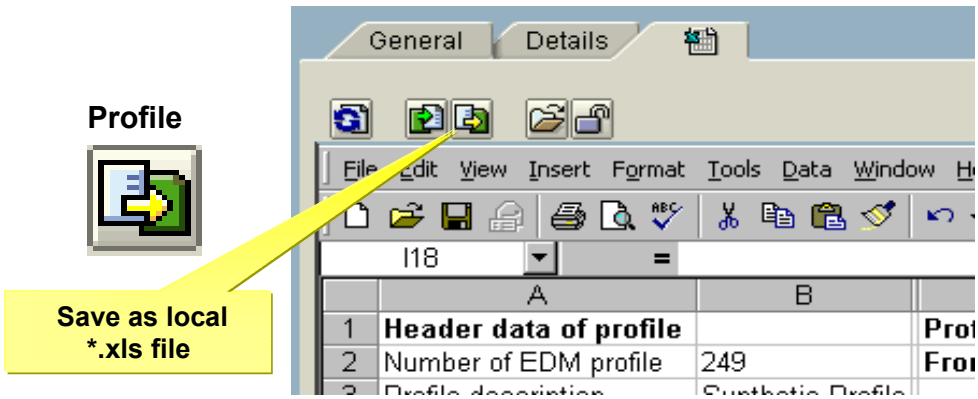
Display Profile Values in EDM Using the OLE Interface



- In addition to the tabular and graphical presentation of profile values within EDM, the values can also be displayed and edited in Microsoft Excel using the OLE Interface. This is possible through the SAP Office integration.
- To display the profile values in Microsoft Excel, choose the following: *Energy Data Management → Profile Management → Profile Header → Change/Display.*
- Once you have selected a profile, a tab page with an Excel symbol appears in the work area. If you choose this tab page, the following data is displayed in an Excel worksheet.
  - Profile header data
  - Profile values
  - Status of profile values
- EDM is fully integrated with Microsoft Excel. You can use all the standard Excel functions such as graphics or macros.

Export Profile Values Using the OLE Interface

- **Export Profile Values to Excel**



- You can export profile values to display, change or save them on your local drive, for example. To do this choose *Export Profile Values from Excel*.
- Requirements (Import/Export/Display):
  - Microsoft ® Excel 97
  - 128 MB memory
  - > 300 MHz
  - 19“ screen recommended

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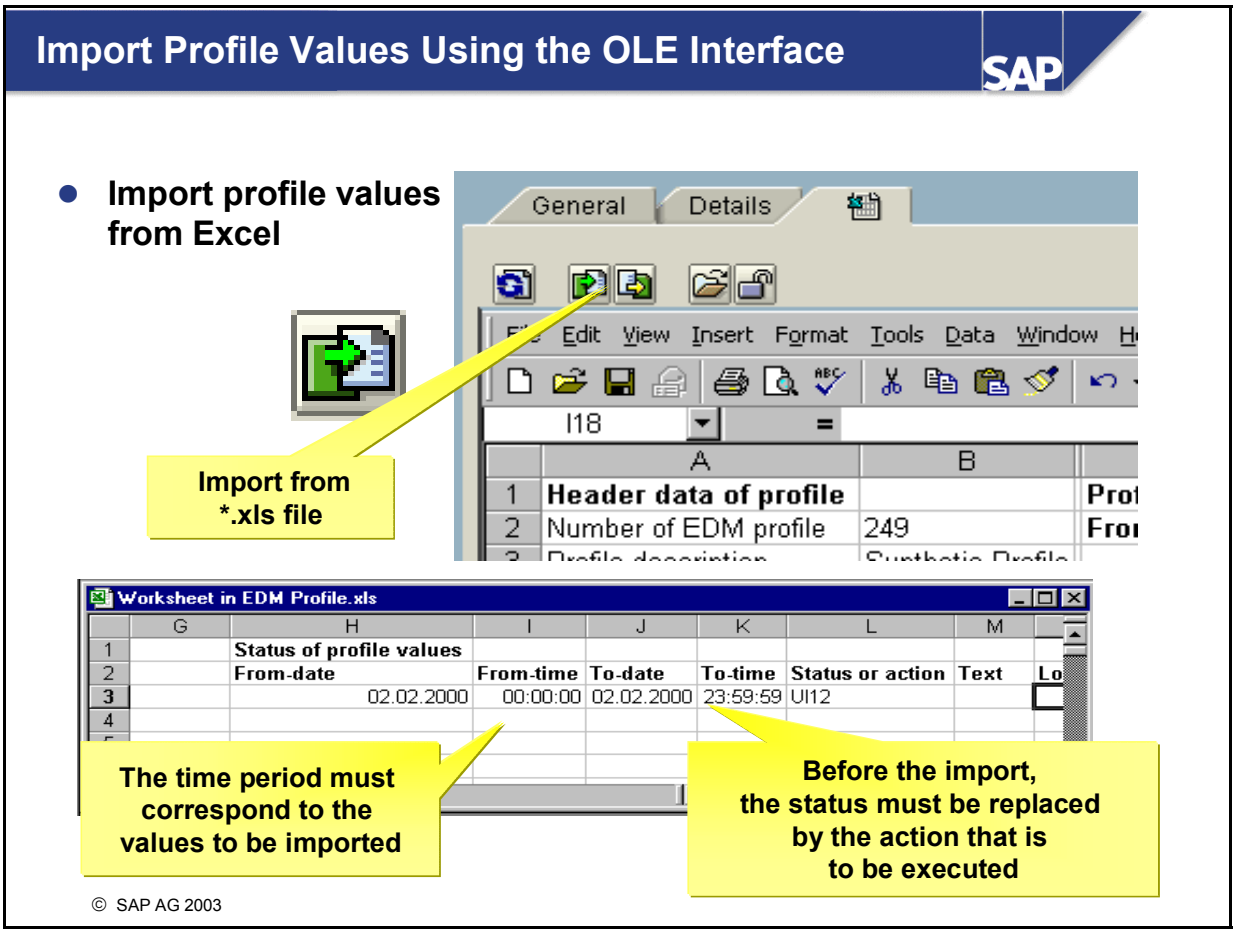
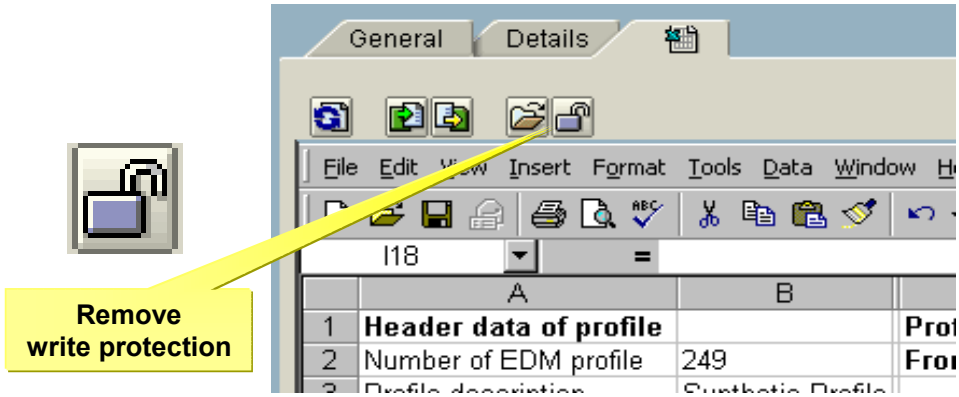
Import Profile Values Using the OLE Interface



- Profile values can be imported back into EDM after the profile has been edited on a local drive. To do this choose *Import Profile Values to Excel*.
- Before you import the file, you must adjust the entry in the *Status or Action* column accordingly in the Excel file.
- The following operations are allowed:
  - UI12 Import valid values
  - UI13 Import estimated values
  - UI14 Import missing values
  - UI15 Import doubtful values
  - UI19 Import overlapping values
- During the import, consistency checks are also run.
- To save the changes, you must choose *File -> Save* in the Excel menu.

Change Profile Values Using the OLE Interface

- **Additional features**



- **Change data using Excel: Formulas, graphical changes, macros, ...**
- **Save changed data locally (*.xls)**
- **Import profiles from Excel**

- Note: It is only possible to save the file using the Excel function *File -> Save as*.

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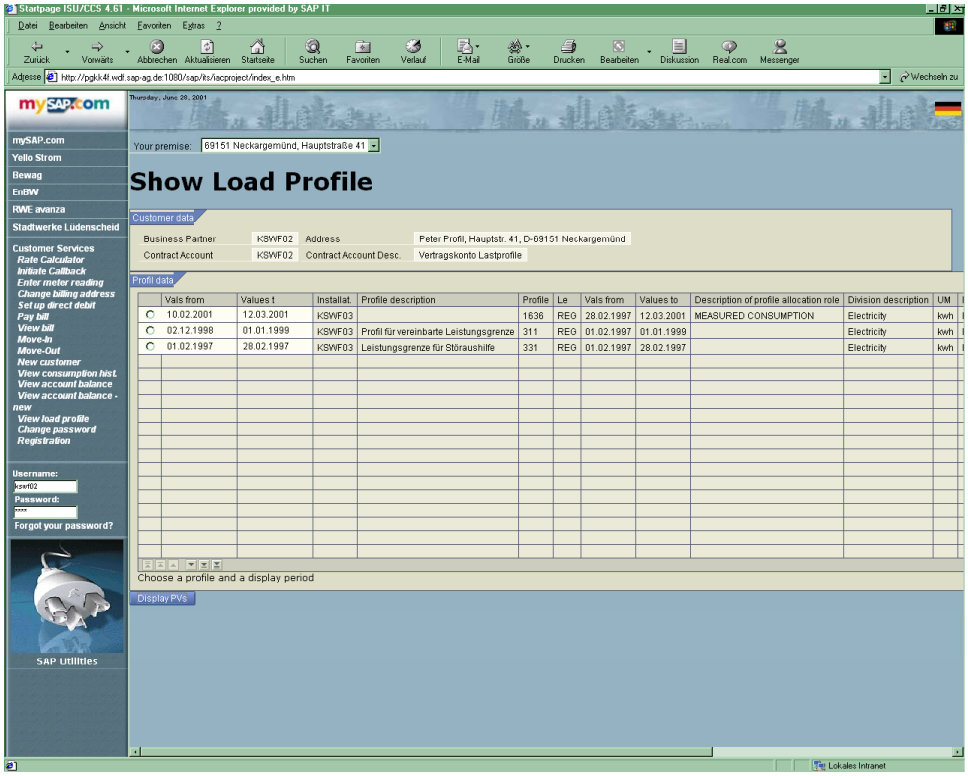
Display Profile Values on the Web (1)



- Profile Values can also be displyed on the web.

Display Profile Values on the Web (2)

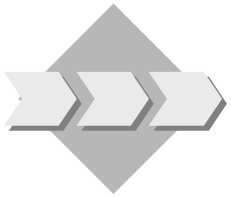
Exercises

Unit: Manage Profile Values

Topic: Manage Profile Values

At the conclusion of this exercise, you will be able to:

- Display profile values in both table and graphical format
- Change profile values (single values and mass changes)
- Display versions
- Use OLE to export profile values and import changed profile values



You have maintained the profile values for the period January to June 2001 for business partner *TP0101A0##*. You must process these values in different ways and display them.

1-1 Display the profile values for business partner *TP0101A0##*. In the SAP menu, choose ***Utilities Industry → Energy Data Management → Profile Management → Profile Values → Display***.

1-1-1 In the search area, enter the profile (*Prof.* tab page) to which you allocated values in the previous exercise, or use the business partner *TP0101A0##* (*GP* tab page) to determine the data.
Choose 01.01.01 - 31.01.2001 as the selection date.

Display the profile values by selecting the box in the selection area.

_____

_____

1-2 Display the profile values for the 06.01.2001.

1-2-1 What was the peak value for that day?

_____

_____

1-2-2 When did the peak value occur?

_____

_____

1-2-3 What is the total consumption on 06.01.2001?

_____

_____

1-2-4 When was January's peak value (date and time)?

_____

_____

1-3 You can also display the profile values as a graphic.

1-3-1 Display the values for January 2001 for your profile as a graphic.

_____

_____

Zoom into the graph step by step.

_____

_____

Select a calendar week.

_____

_____

1-3-2 Show the legend:

_____

_____

Add a linear trendline:

_____

_____

Change the line style to a “dashed” line:

_____

_____

1-4 To change the profile values manually, choose ***Utilities Industry → Energy Data Management → Profile Management → Profile Values → Change***.

1-4-1 Select the individual profile value that you wish to change and make your changes.

_____

_____

Save your entries.

Choose *Yes* when asked if you want to create a version for your profile.

_____

_____

Monitor the status of the change.

_____

_____

1-4-2 For mass changes, choose *Carry Out a Mass Change*.
Select the operation (‘+’, ‘-‘, for example) that you wish to carry out.

_____

_____

Enter a value in the *With Value* field.

Make a selection in the *To Values From* and *To* fields.

Choose *Enter*.

Choose *Yes* when asked if you want to create a version for your profile.

1-5 If you want to display the profile values for a version once you have made the changes, choose ***Utilities Industry → Energy Data Management → Profile Management → Profile Values → Change***.

1-5-1 Choose *Version*. Highlight the rows of the versions that you wish to display. (Note: You should have three versions.)

_____

_____

1-5-2 Display the selected versions as a graphic.

_____

_____

1-6 If you want to export and change profile values with OLE, choose ***Utilities Industry → Energy Data Management → Profile Management → Profile Header → Change/Display***.

1-6-1 Enter your historic profile for identification. Choose 07.15.01 as the selection date. Double-click on the profile in the selection area. Choose the tab page with the Excel symbol. Choose *Export Value to Excel* and select the folder on your local hard drive where you want to save the file.

_____

_____

1-6-2 Open the file on your local PC and make the appropriate changes to the profile values.

_____

_____

1-6-3 Under the *Status or Action* column, change the status to UI12 (Valid values). Make sure that the import time and data in the *Profile values* area is the same as in the *Status of profile values* area.

_____

_____

Save the data and close the application.

1-6-4 Go back into the SAP system. Choose the *Import Profile from Excel* pushbutton and select the location of your file. Choose *Enter*.

_____

_____

Save your entries.

1-6-5 Check whether the changes that you made in Excel on your local PC have been transferred.

_____

_____

1. 1-7 You can also maintain profile values using manual extrapolation.

1-7-1 Select your profile for the measured load shape from the table of profile values and choose the period from 05.01.2001 to 07.01.2001.

1-7-2 Extrapolate the values from 06.01.2001. How were the values determined? Check the values by comparing them with the forecast values.

_____

Unit: Manage Profile Values

Topic: Manage Profile Values

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1-1

1-1-1 Proceed as described in the exercise.

1-2 Select the value presentation of the profile values for the 06.01.2001.

Enter the date 06.01.2001 in the *Values* tab page. Choose *Enter* or choose *Next day* until you reach the 06.01.2001.

1-2-1 What was the peak value for that day?

Field name	Value
Peak value	12.94

1-2-2 When did the peak value occur?

Double-click on the peak value. The system specifies the interval in which the peak value occurred.

Field name	Value
Interval	17:30

1-2-3 What is the total consumption on 06.01.2001?

Choose *Aggregation* to display the total consumption.

Field name	Value
Total consumption	1,005.74

1-2-4 When was January's peak value (date and time)?

Ensure that the selection date includes a range of one month (01.01.2001 – 01.31.2001).

Select the *Maximum value* pushbutton.

Double click on the value to display the date and time.

Field name	**Values**
Date	13th January
Time	13:15

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1-3

1-3-1 Display the values for January 2001 for your profile as a graphic.

Choose the *Display Graphic* icon.

Zoom into the graph step by step.

Choose *Zoom In* (magnifying glass with + sign).

Select a calendar week.

1-3-2 Show the legend:

Choose the *Status Legend* icon.

Add a linear trendline:

Right click on the values in the graph and choose the *Add Trend Line* menu option.

Change the line style to a ‘dashed’ line:

In the *Line* tab page, choose the dashed line in the *Style* field.

1-4 Proceed as described in the exercise.

1-5 Proceed as described in the exercise.

1-6 Proceed as described in the exercise.

1-6-1

1-6-2

1-6-3 Note: The *From-Dates* and the *From-Times* in the *Profile Value* and *Status of Profile Value* sections of the Excel worksheet should be identical. The *To-Date* in the *Status of Profile Value* section should be the same as the last date in the *Profile Value* section. The *To-Time* in the *Status of Profile Value* section should be the same as the last interval end time in the *Profile Value* section. For example, if the profile values have been generated for one day, 01.01.2001, the *Status of the Profile Value* section should be as follows: From-Date = 01.01.2001, From-Time = 00:00:00, To-Date = 01.01.2001, To-Time = 23:59:59.

1-6-4

1-6-5

1-7 You can also maintain profile values using manual extrapolation.

1-7-1 Select your profile for the measured load shape from the table of profile values and choose the period from 01.05.2001 to 01.07.2001.

Go to 01.06.2001.
Select the column with the profile values. Choose *Carry out a Mass Change.*
In the *Operation to be Carried Out* field, select the entry *Extrapolate Values*.
Enter a reference consumption.

1-7-2 Extrapolate the values from 01.06.2001. How were the values determined? Check the values by comparing them with the forecast values.

The values were copied from the comparison period of the forecast profile in the register. You can check the values by displaying both the extrapolated and forecast values.

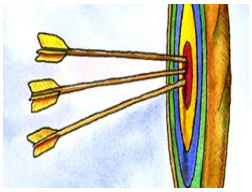
Formula Profiles: Unit Contents

- Formulas and Formula Profiles
- Elements of a Formula Profile
- Calculation Workbench

Formula Profiles: Unit Objectives

At the conclusion of this unit, you will be able to:

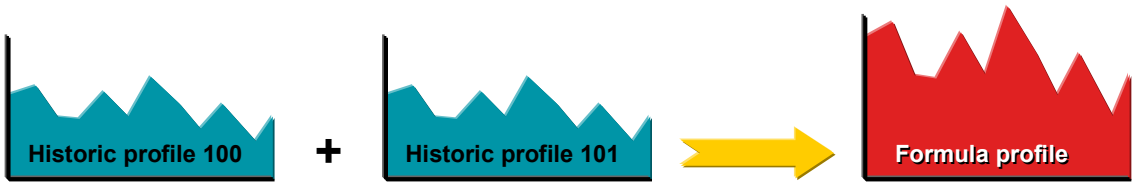
- Define formulas and formula profiles
- Describe the use of a formula profile
- Present the elements of a formula profile
- Explain the use of status groups and input/output parameters
- Describe formula allocation
- Use the Calculation Workbench to calculate formula profiles
- Create and calculate a formula profile



Formula Profiles: Formulas and Formula Profiles

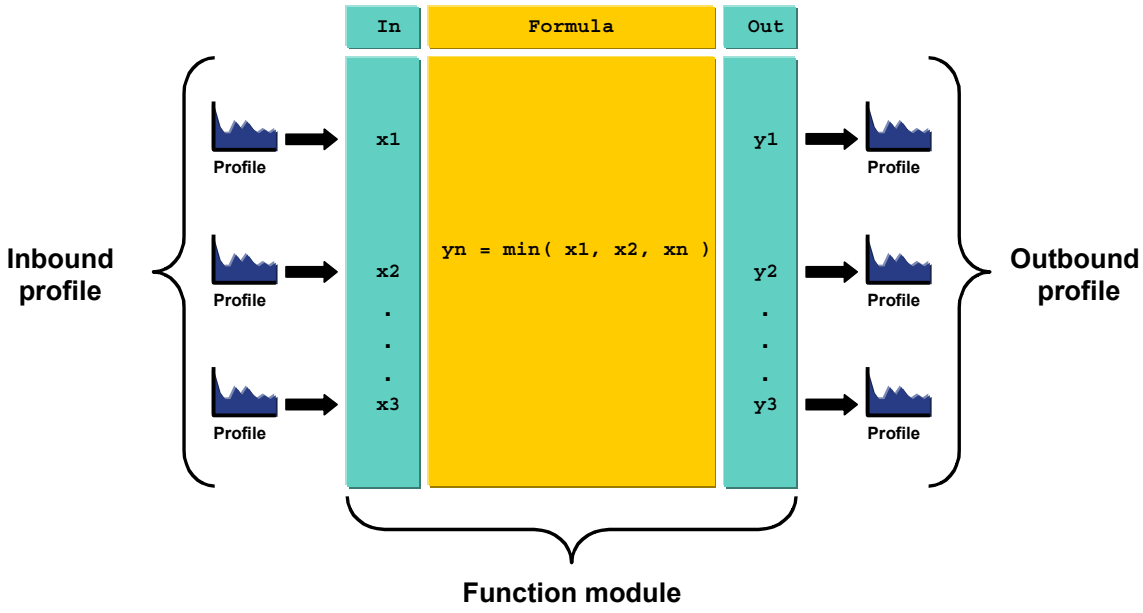
- Formulas and Formula Profiles
- Elements of a Formula Profile
- Calculation Workbench

What is a Formula Profile?



- **Formula profiles** contain values that were determined on the basis of a calculation rule.
  - The calculation rule is mapped in a formula.
  - You can use the formula profiles to map constant dependencies for profiles on a long-term basis.
- Formula profiles, like all other profiles, are created using the *Create Profile* transaction. You must choose the *Formula* profile type in the profile header. You can then the enter the appropriate details that are needed for formula profiles.

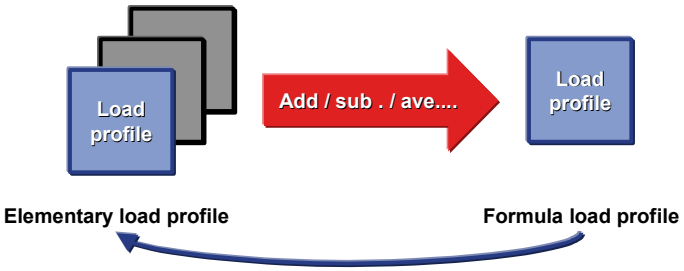
Definition of the Formula



- A **formula** is a calculation rule that converts the different input parameters (profile values) into output parameters (formula profile values), according to a mathematical algorithm.
- Formulas:
  - Form the basis of the profile calculation, in which the mathematical dependencies are mapped. Are implemented as function modules and allocated in the profile header.
  - Have input and output parameters, the amount and category of which are defined in the formula definition.
  - Are delivered by SAP and can be adjusted in Customizing.
  - Are used in the interface for billing.

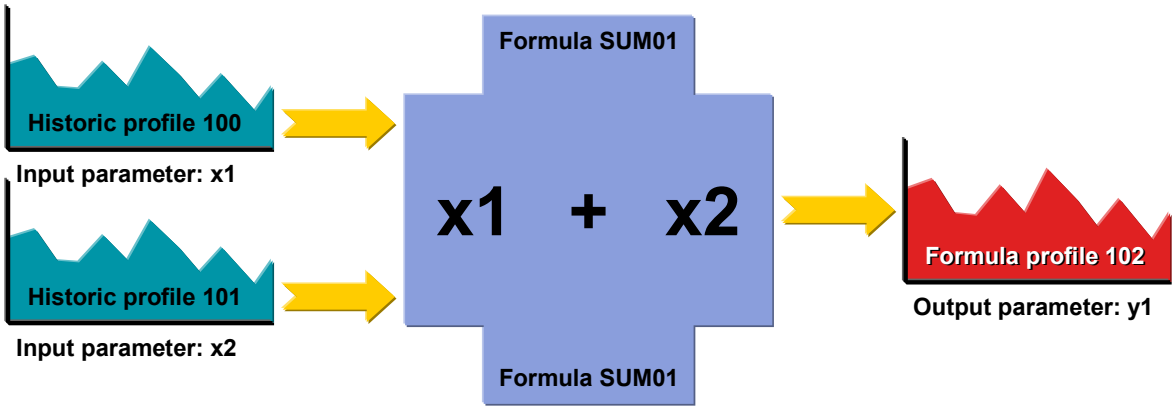
Formula Profile Calculations

- Operations involving several profiles
  - Addition for each interval
  - Subtraction for each interval
  - Average value for each interval
  - Multiplication with a factor
  - Other

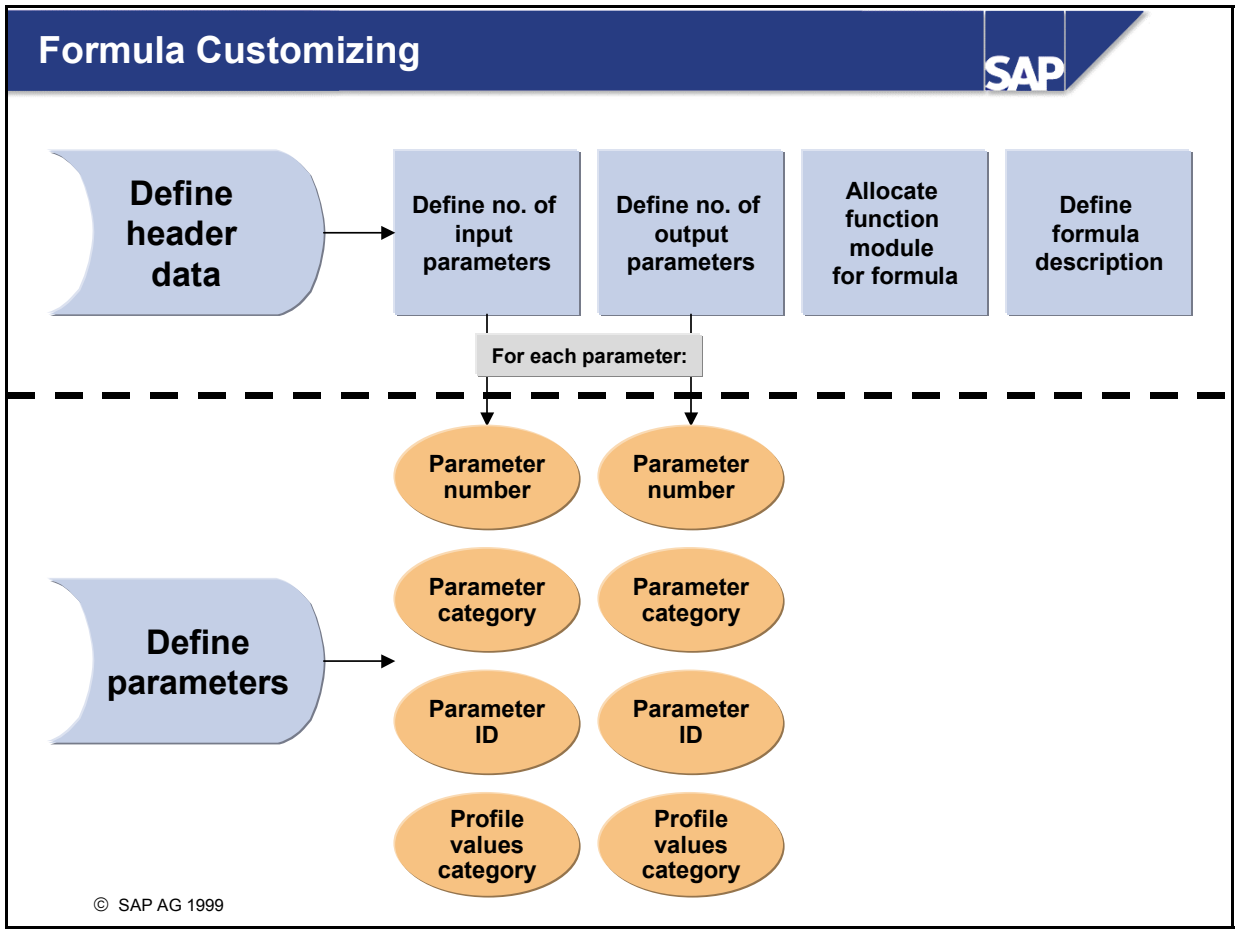


Formula SUM01: Example

SUM01: Add two profiles (quantities)



- Formula: SUM01 - Addition of 2 profiles (quantities)
  - Input parameter
    - Profiles to be added together
  - Output parameters
    - Formula profile that contains the sum of the values from the input parameters



- In Customizing, you can define formulas in addition to those that were already predefined by SAP.
- Customizing path:
  - *SAP Utilities -> Tools -> System Modifications -> User-Defined Enhancements for Energy Data Management -> Formulas -> Define Formula.*
- Parameter definitions:
  - Parameter number: Defines the number of input and output parameters in the formula.
  - Parameter category: Input or output
  - Parameter ID: Description of formula parameter
  - Profile value category: Classifies values that you manage in the profile.

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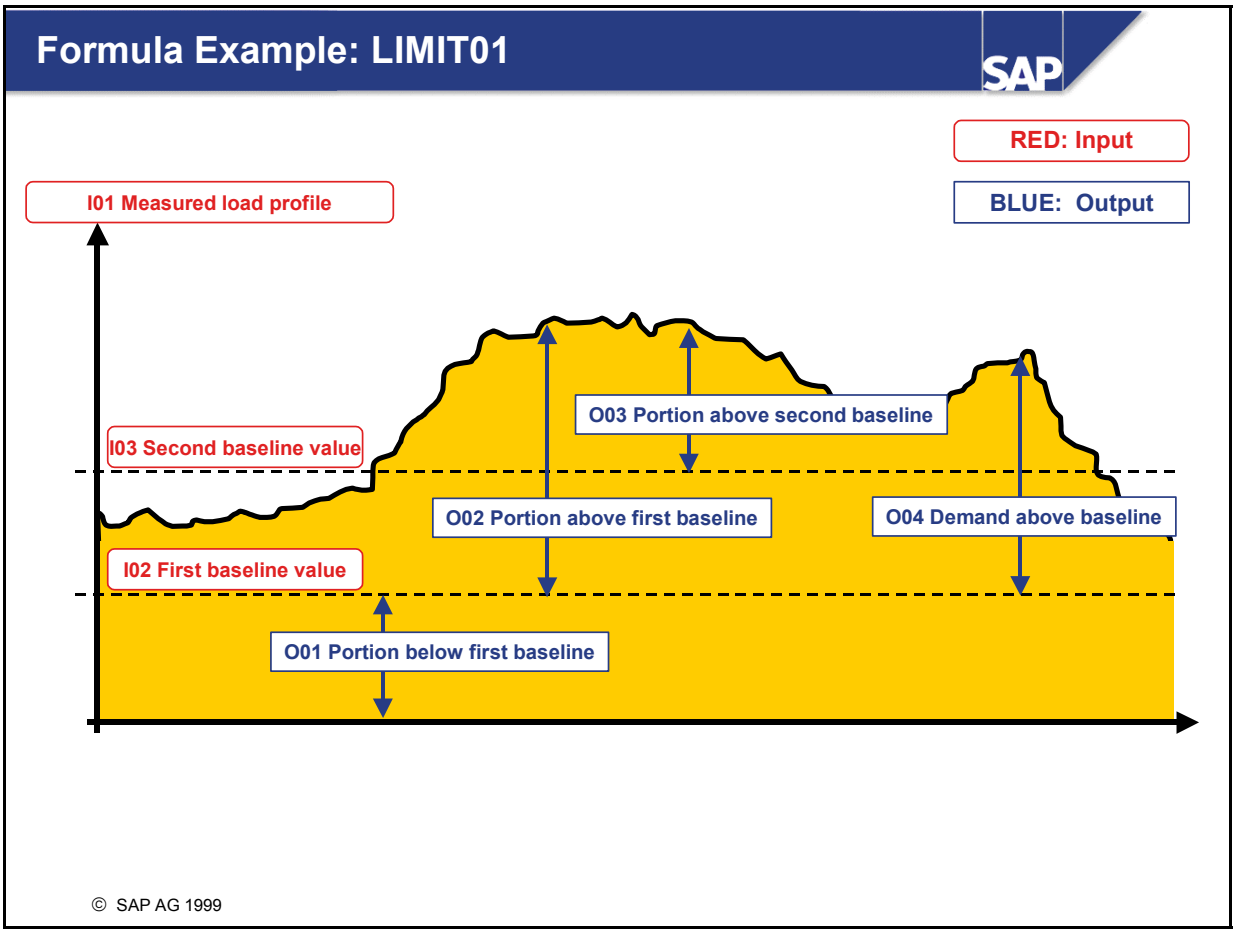

- Formula: LIMIT01
- Input parameters:
  - I01: Measured load profile: Quantity
  - I02: First baseline value: Quantity
  - I03: Second baseline value: Quantity
- Output parameters:
  - 001: Portion below first baseline: Quantity
  - 002: Portion above first baseline: Quantity
  - 003: Portion above second baseline: Quantity
  - 004: Demand above baseline: Demand
- Function module:
  - ISU_EDM_FORMULA_0004
- Formula description: Value determination above and below a demand baseline.

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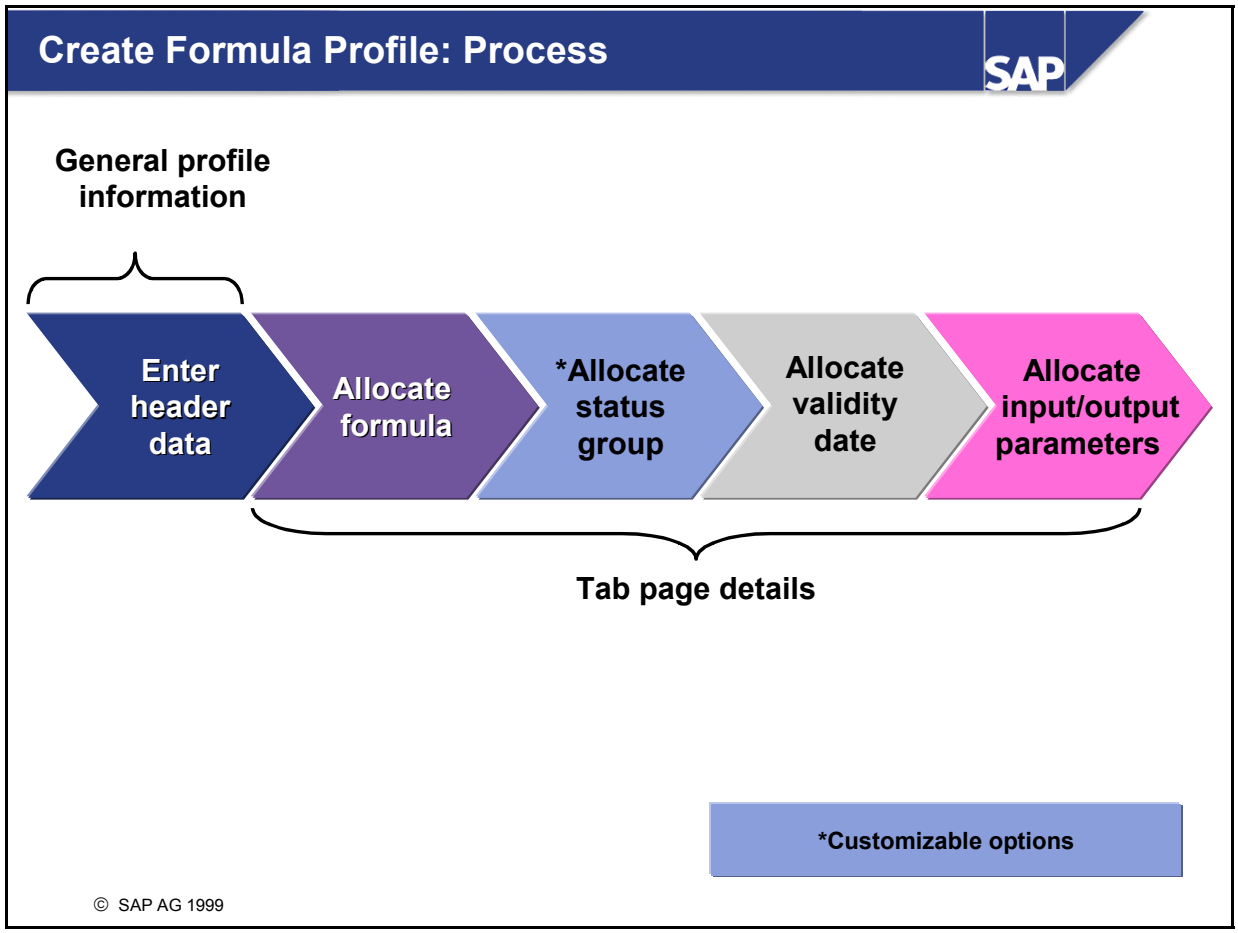

- Details
  - Formula (can be displayed using transaction [EEDM08])
  - Status group
  - Formula allocation
  - Allocation validity
  - *No calculation* checkbox
- The details of this process are discussed in the following slides.

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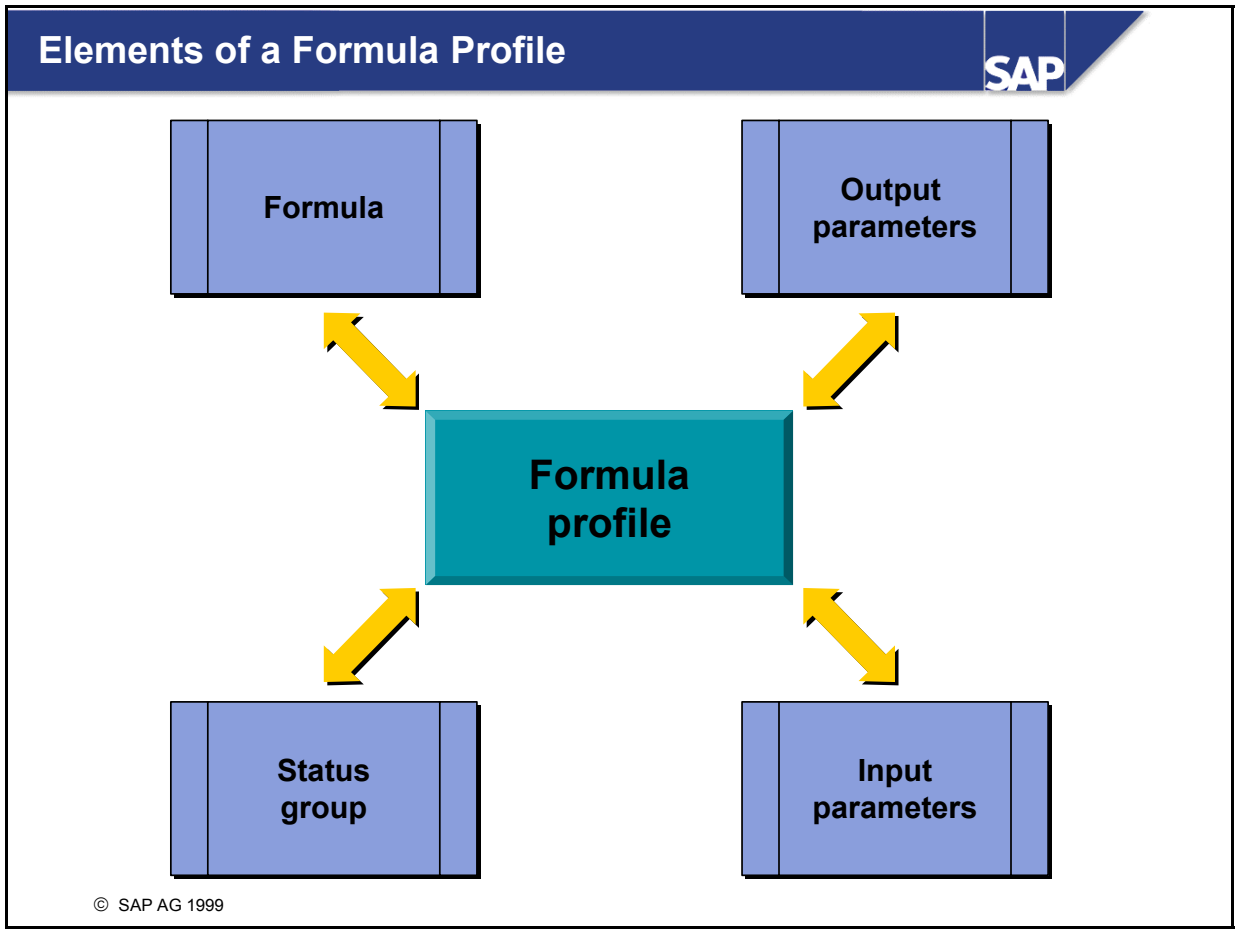
Formula Profile: Elements of a Formula Profile

- Formulas and Formula Profiles
- Elements of a Formula Profile
- Calculation Workbench



- Formula profiles are created using the *Create Profile Header* transaction [EEDM06]
- The four most important elements of the formula profile are:
  - Formula
  - Status group
  - Input parameter
  - Output parameter
- Profiles are allocated to the input and output parameters within the formula profile.

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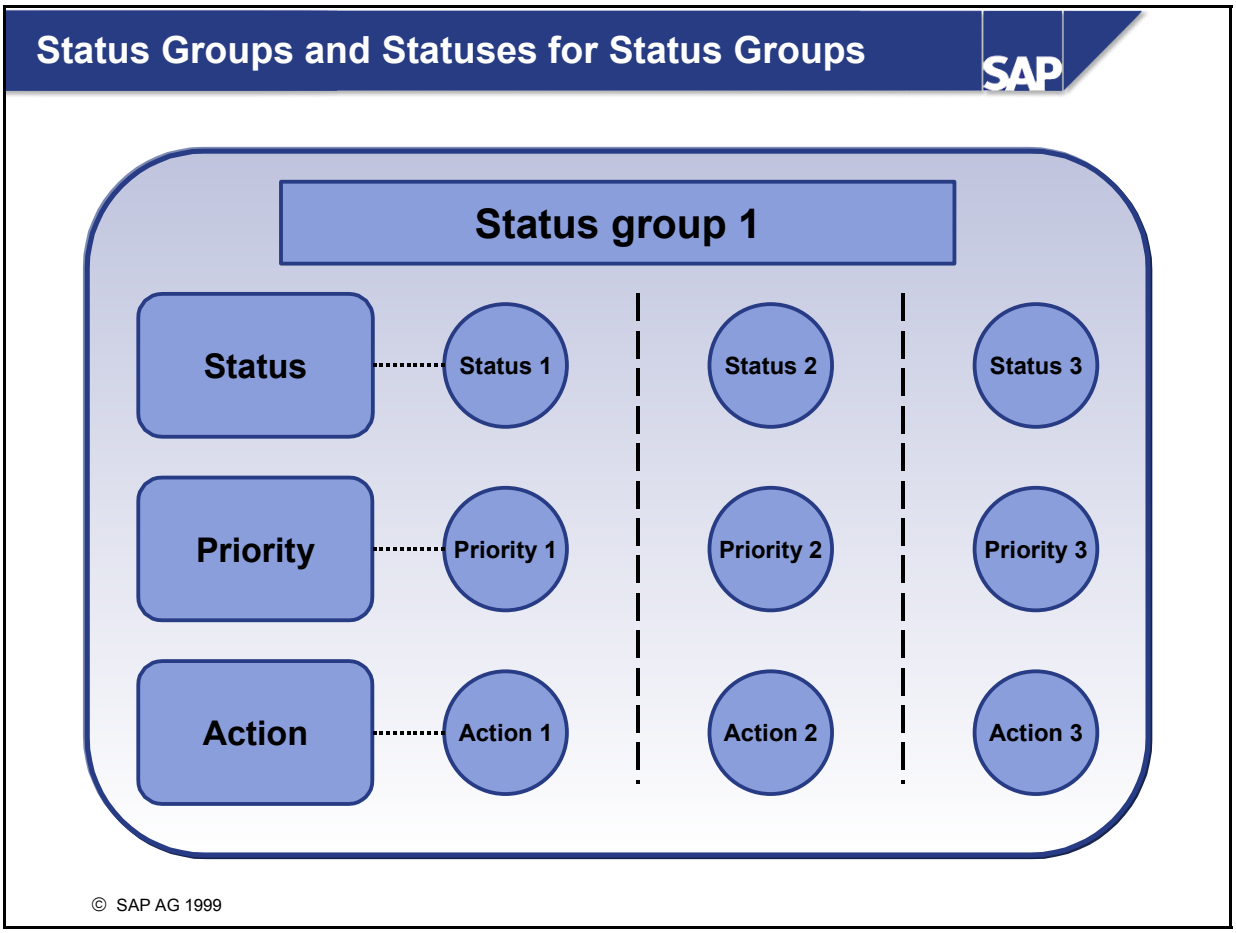

- When you create a formula profile using the *Create Profile Header* transaction, you must allocate the **status group**. **Status groups** define the status of the input parameters when converted into output parameters.
- Within the status group, the status and priority determine which business process (action) to use. Once the status has been determined - with the highest priority for the output parameters of a formula - the action allocated to this status is determined and executed.
- The meaning of the individual status group elements:
  - Status refers to the status of the input parameter (for example, no value, value is valid, value is estimated, and so on).

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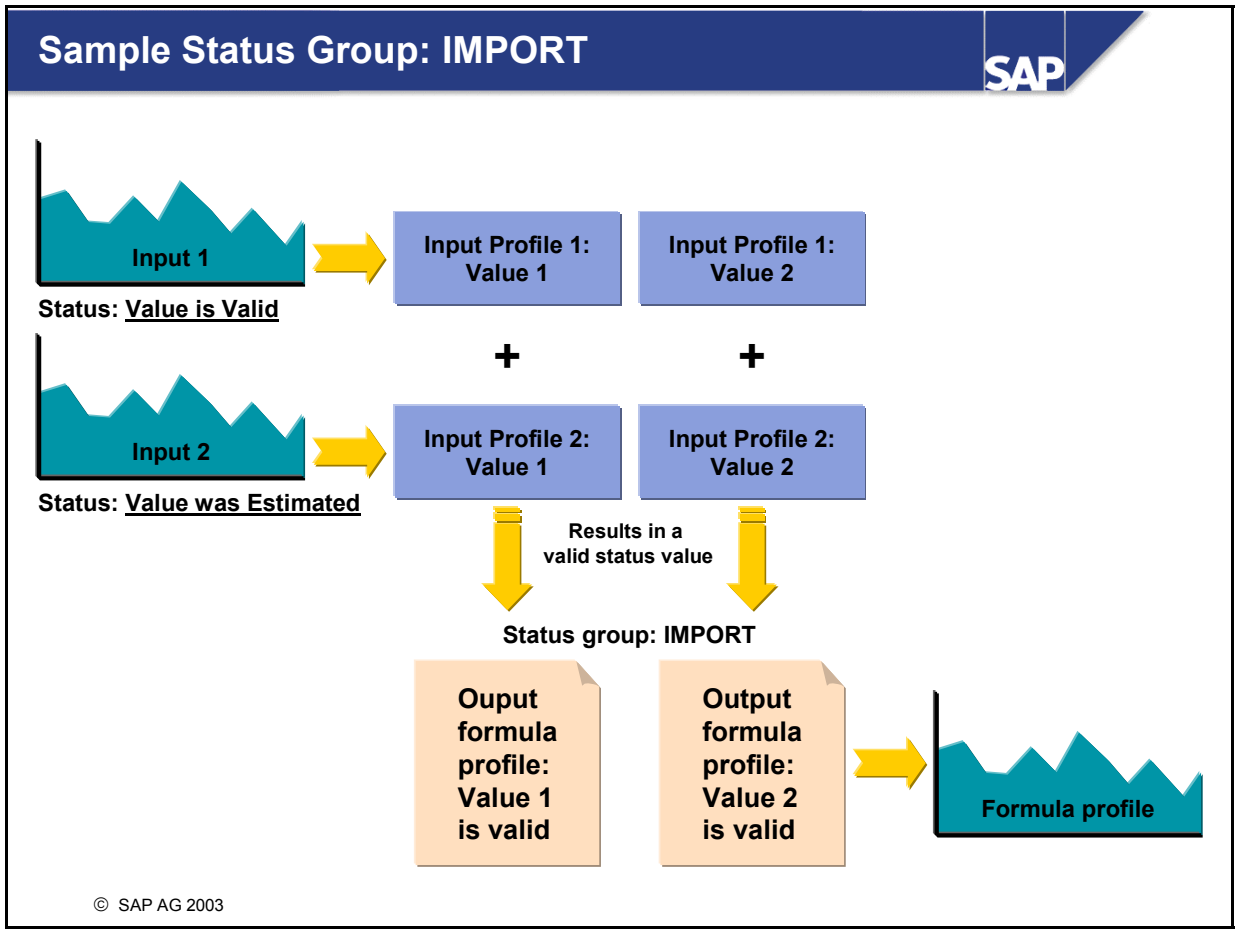
Actions and Statuses

Action	Description
UI10	Value changed or entered manually
UI11	Release value
UI12	Import valid value
UI13	Import estimated value
UI14	Import missing value
UI15	Import implausible value
UI16	Estimate value
UI17	Lock value
UI18	Delete version of value
UI19	Import overlapping values
UI20	Export value
UI21	Remove value protection
UI22	Set deletion flag
UI23	Set value protection

Allocate an action to each status

Status	Description
IU010	Value not available
IU011	Value missing
IU012	Value valid
IU013	Value was estimated
IU014	Value implausible
IU015	Value changed/entered manually
IU016	Value released
IU017	Value locked
IU018	Value protected



- In the example above, the formula profile is allocated to the **IMPORT** status group. The status groups are set up in Customizing.
- The IMPORT status group contains the following statuses, priorities and actions:

Status	Status Priority	Action
IU012–Value is Valid	1	UI12-Import Valid Value
IU013–Value was Estimated	2	UI13-Import Estimated Value

- Because the status ‚Value is Valid' has the highest priority, the action ‚Import Valid Value' is performed.

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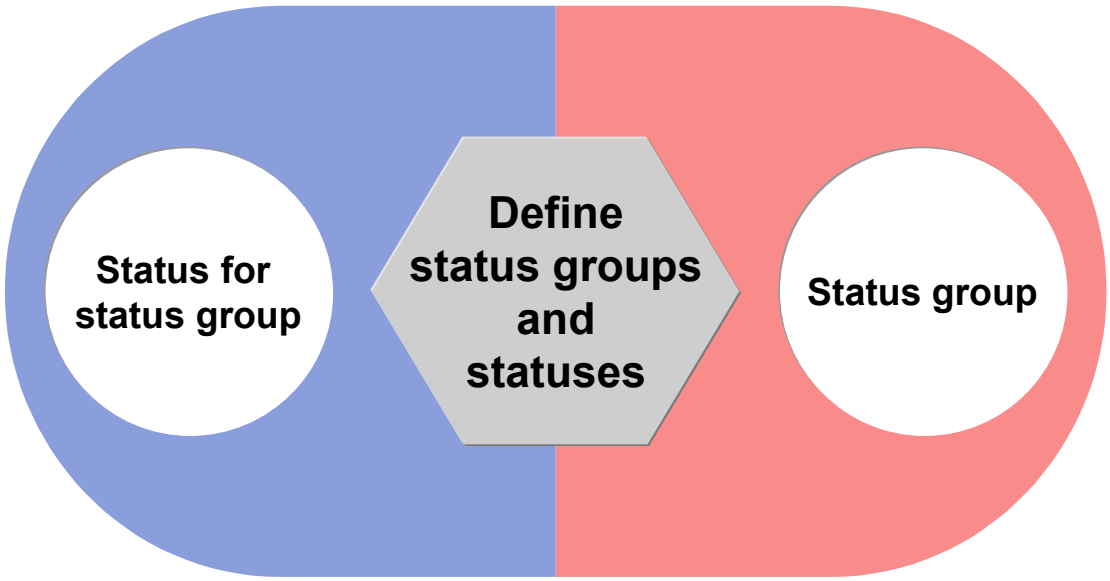
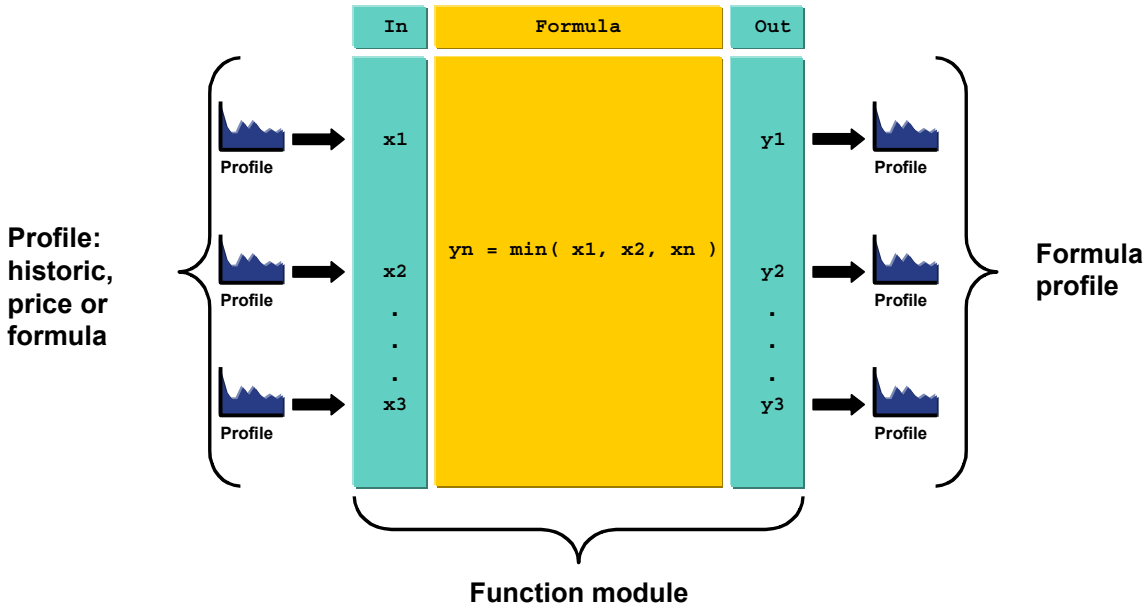
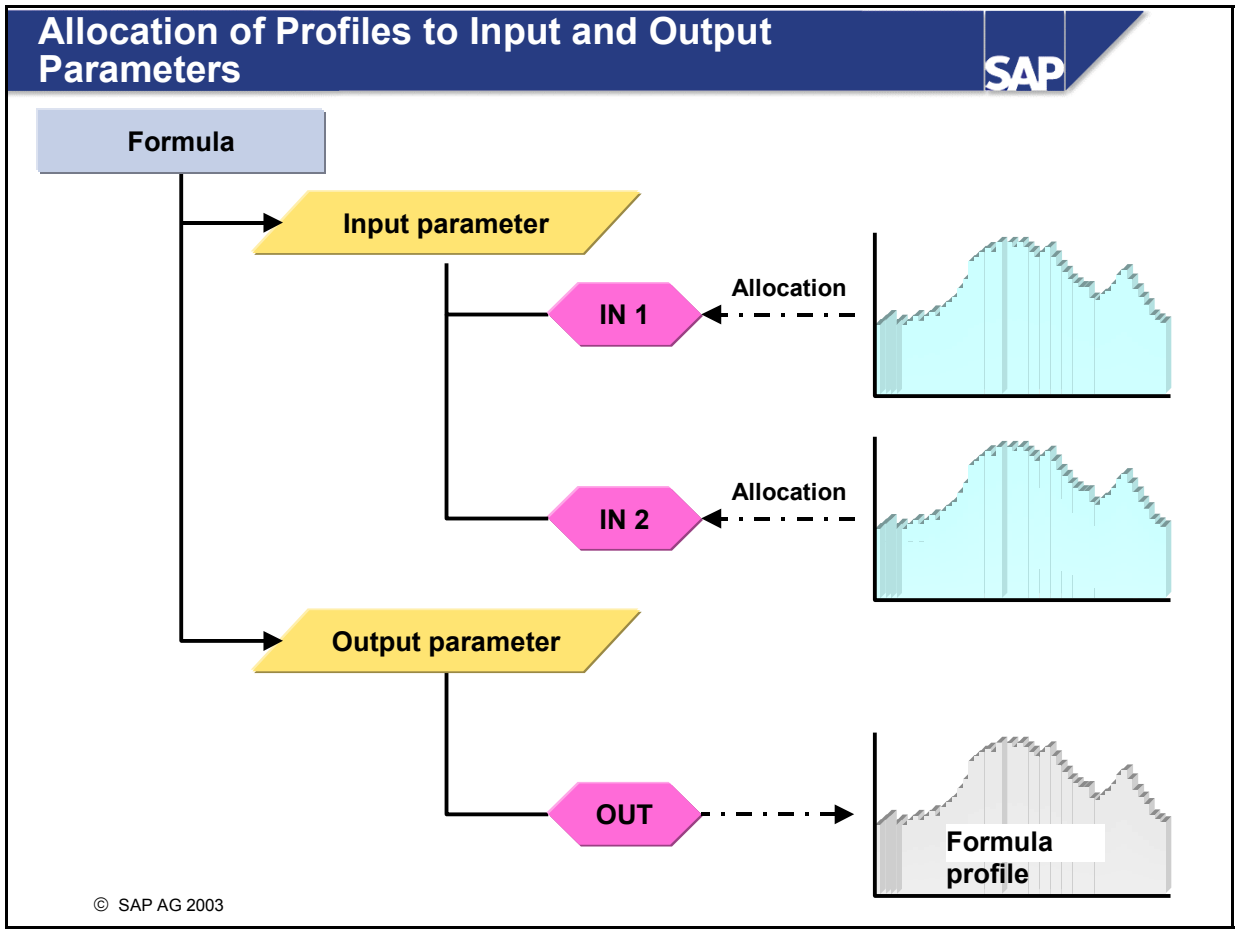
Define Status Groups and Statuses



- In this Customizing activity, you define and prioritize statuses and actions, and arrange them into status groups. Status groups are used in the profile calculation. When the status is determined for the result value of a formula, the action with the highest priority of all input parameters is determined.
- Customizing path: *SAP Utilities -> Energy Data Management -> Profile Management -> Formula Profiles -> Profile Calculation -> Define Status Group and Statuses for Status Group.*
  - Status group description
  - Status for status group
    - Status: Key that informs you of the current status of an object.
    - Status priority: Defines which status of a status group is determined for the result value of a formula.
    - Action: Defines which business action is to be executed on the basis of the priority and status determination.
- For more information about Customizing, see the SAP Service Marketplace http://service.sap.com. Choose *Enter now*, and enter your user and password. Then choose *Solution Details -> Industry Solutions -> mySAP Utilities -> Media Center -> Energy Data Management -> Literature -> Cookbook Customizing Interfaces to External Systems.*

Input and Output Parameters





- For each profile allocated to the input and output parameters in the formula, specify the following information:
  - *No calculation*: If you select this field, the formula allocation is not calculated, although calculation-triggering events (such as changed profile values) have taken place.
  - *No status*: If you select this field, the statuses of this input parameter are not taken into account for status determination for the values of the output profile (this means the formula profile).
  - *Consecutive number*
  - *Profile number*
  - Validity period (from-to) of parameter allocation

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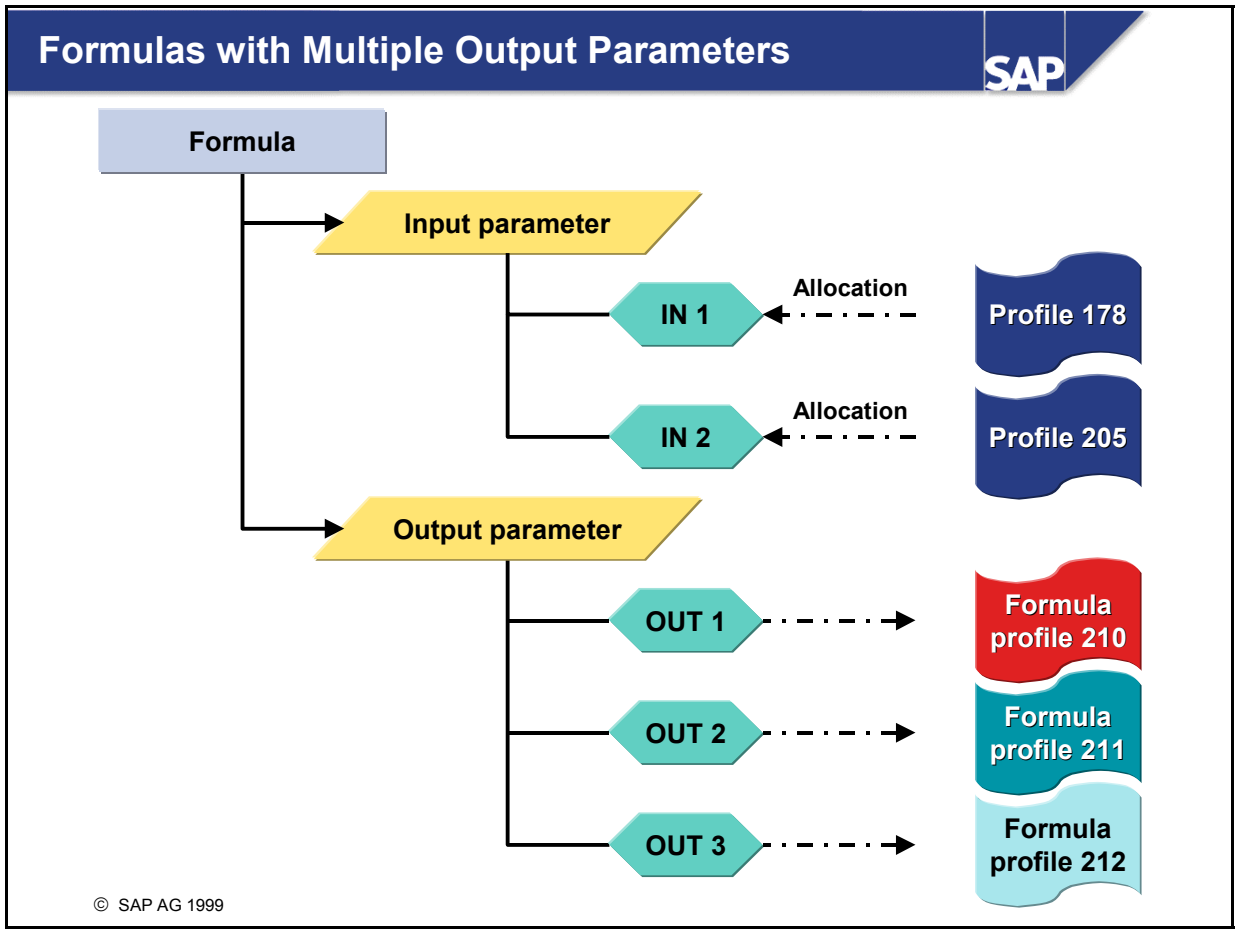

- When a formula has multiple output parameters, each formula profile must be defined individually for the correponding output parameter. This means that a separate profile header is created for each output parameter.
- The above example includes a formula with three output parameters. A separate formula profile is allocated to each output parameter.

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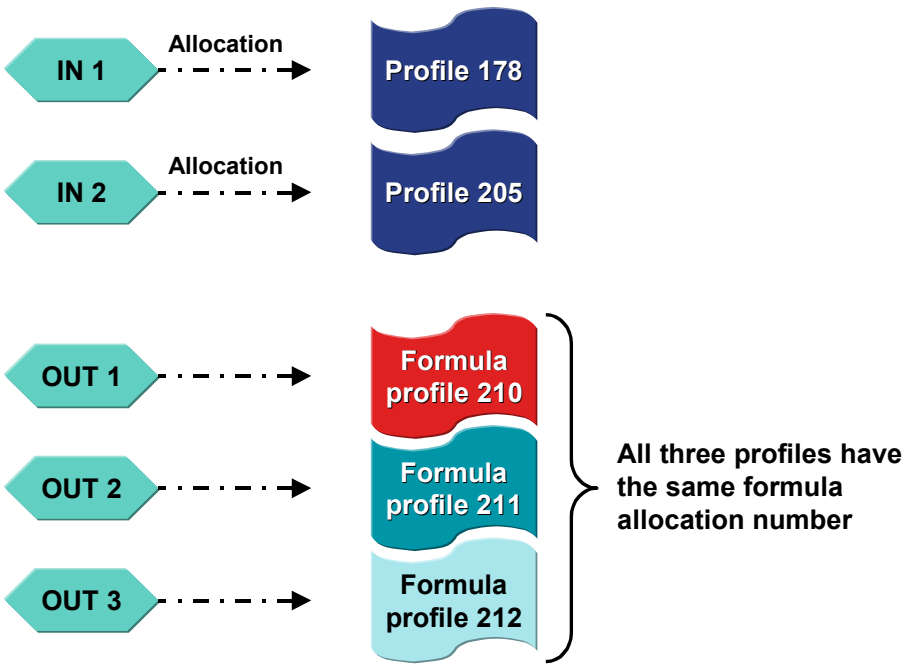
Formula Allocation Number



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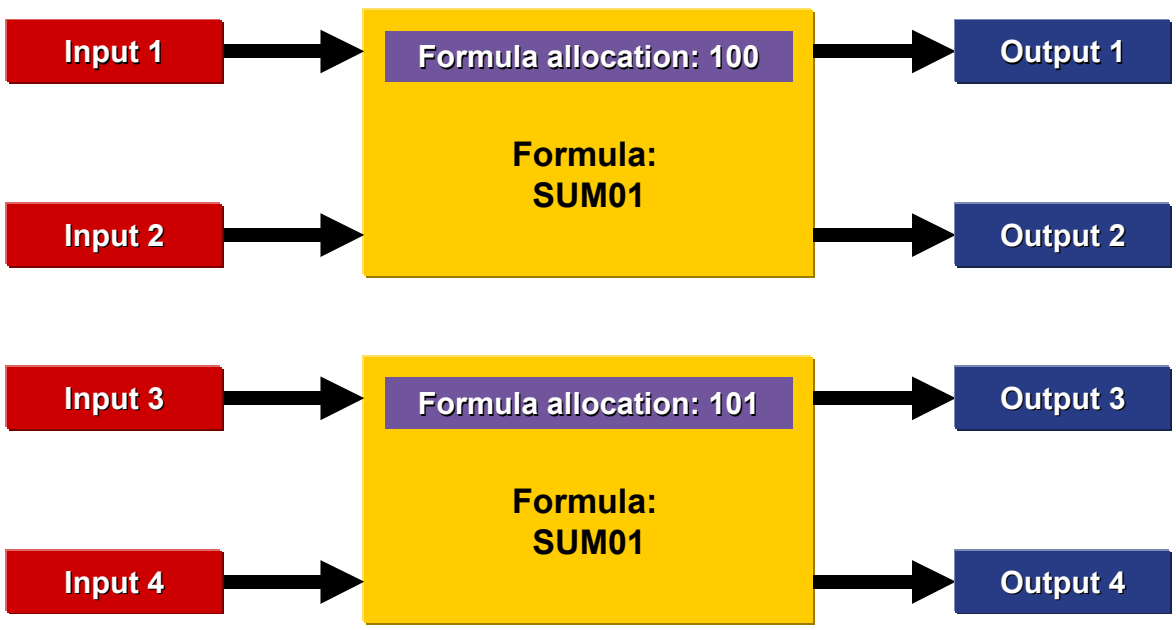
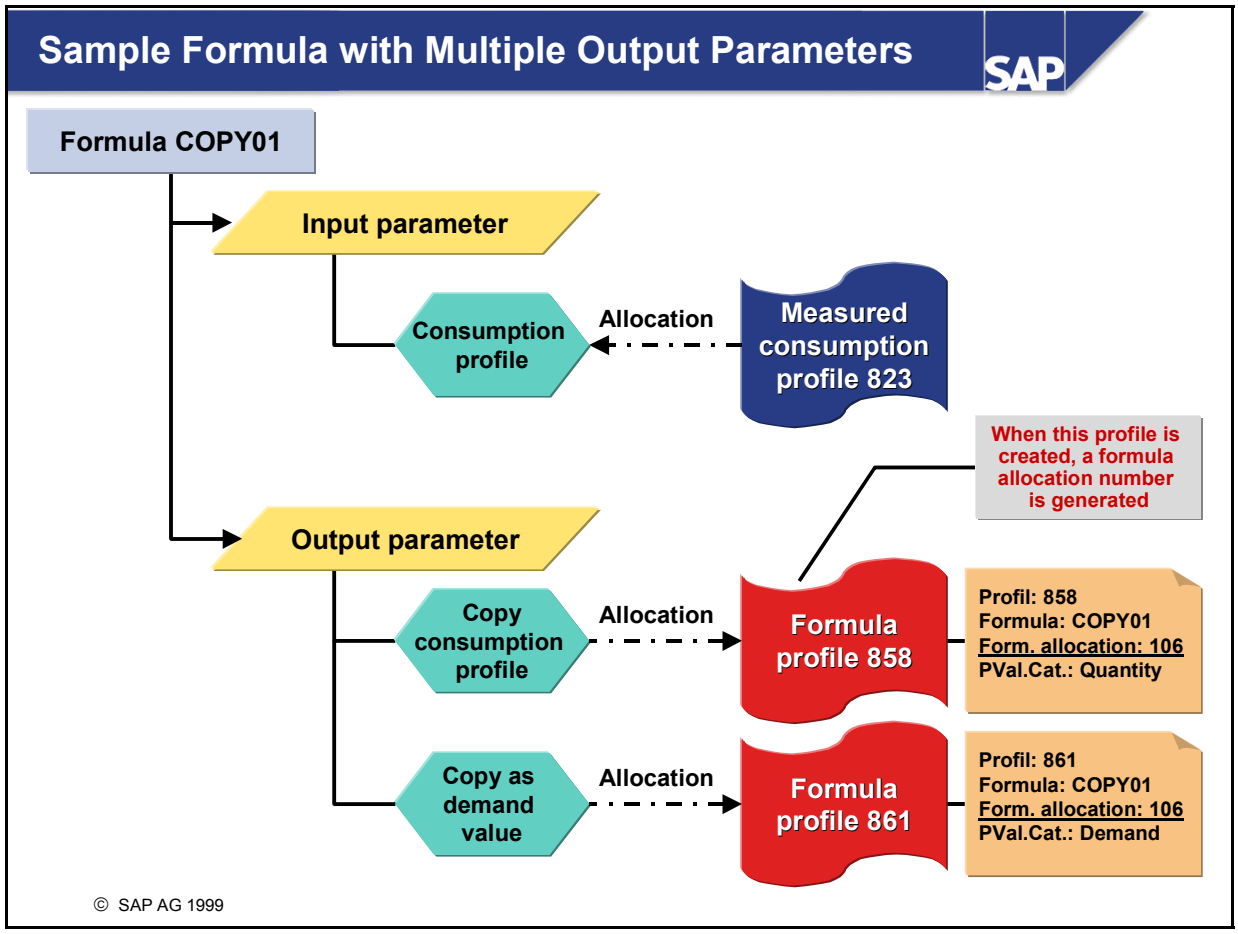
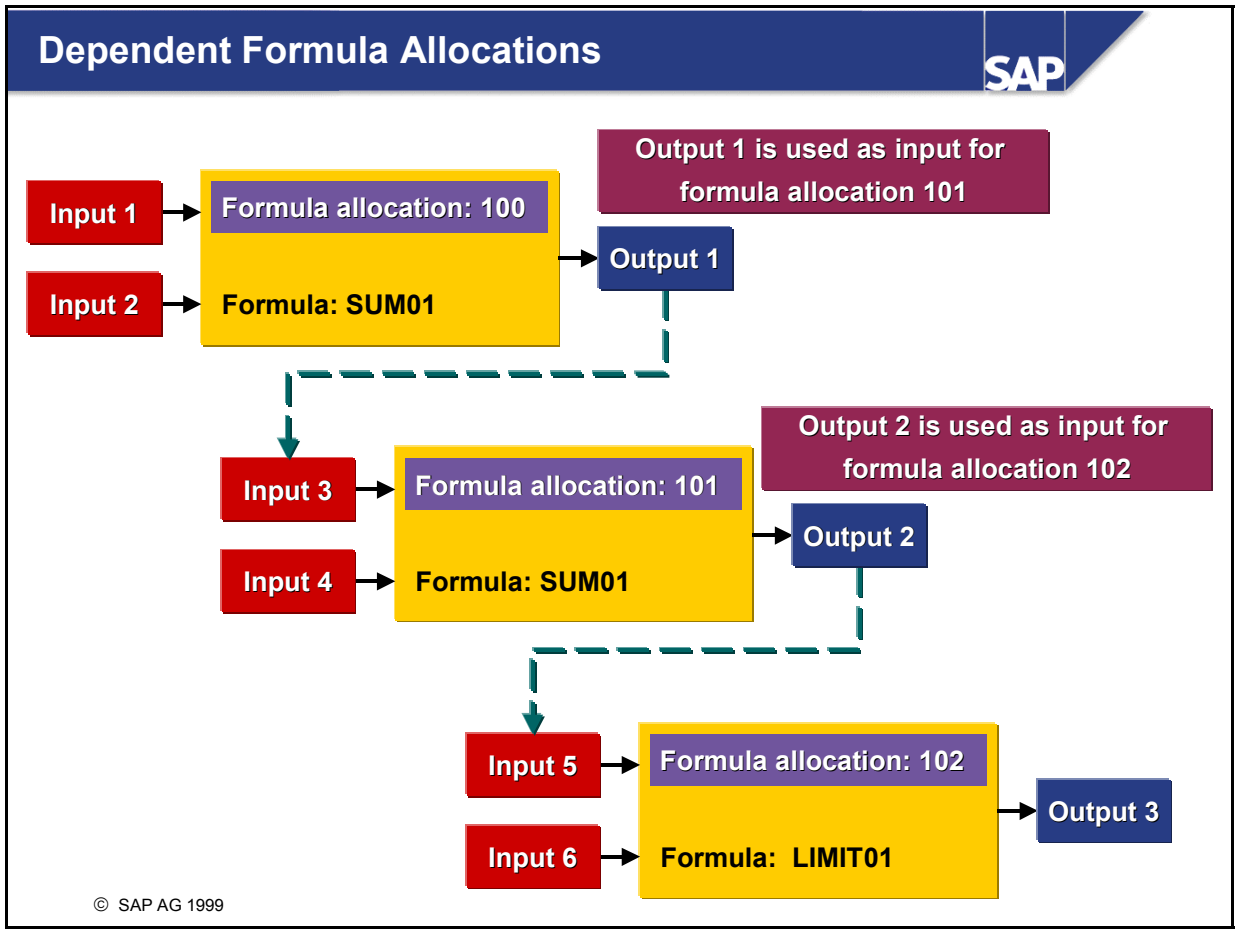
Formula Allocation



- A formula from the same category can exist more than once in the system. The number of the formula allocation is used to differentiate between the individual formulas.
- In the above example, formula SUM01 is used twice in the system. Formula allocation numbers 100 and 101 are used for differentiation.
- When you create a formula profile header, a formula allocation number is automatically generated. When there are multiple output parameters defined in the formula, as shown above, you must create a formula profile for each output parameter.
- You can use the input help (F4) function for formula allocation to display all formula allocations that do not yet have output parameters, and have the same interval lengths.



- In the above example, formula COPY01 is used to copy one profile into two output profiles:
  - Formula COPY01 has an input parameter, to which a consumption profile (load shape) is allocated.
  - Formula COPY01 has 2 output parameters
    - Output parameter 1 is allocated a copy of the consumption profile.
    - Output parameter 2 is allocated a profile, in which the consumption values have been converted into demand averages.



- You can create complex formula allocation hierarchies that are taken into account in the formula calculation. The calculation mechanism takes into account lower-level formula allocations in the hierarchy when higher-level allocations are flagged for calculation by the calculation-triggering events.
- You can use the Calculation Workbench to present formula allocation hierarchies in a graphic.

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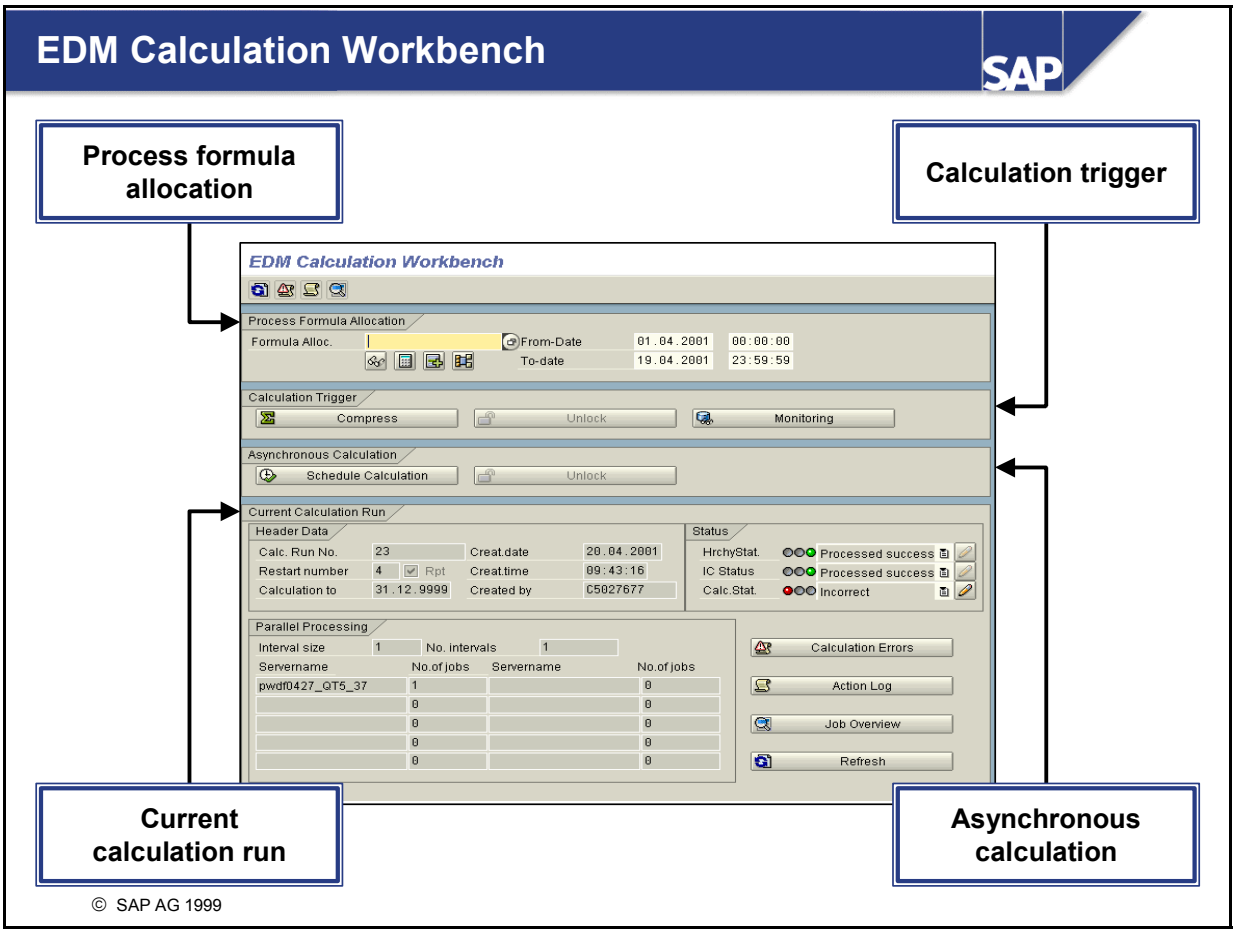
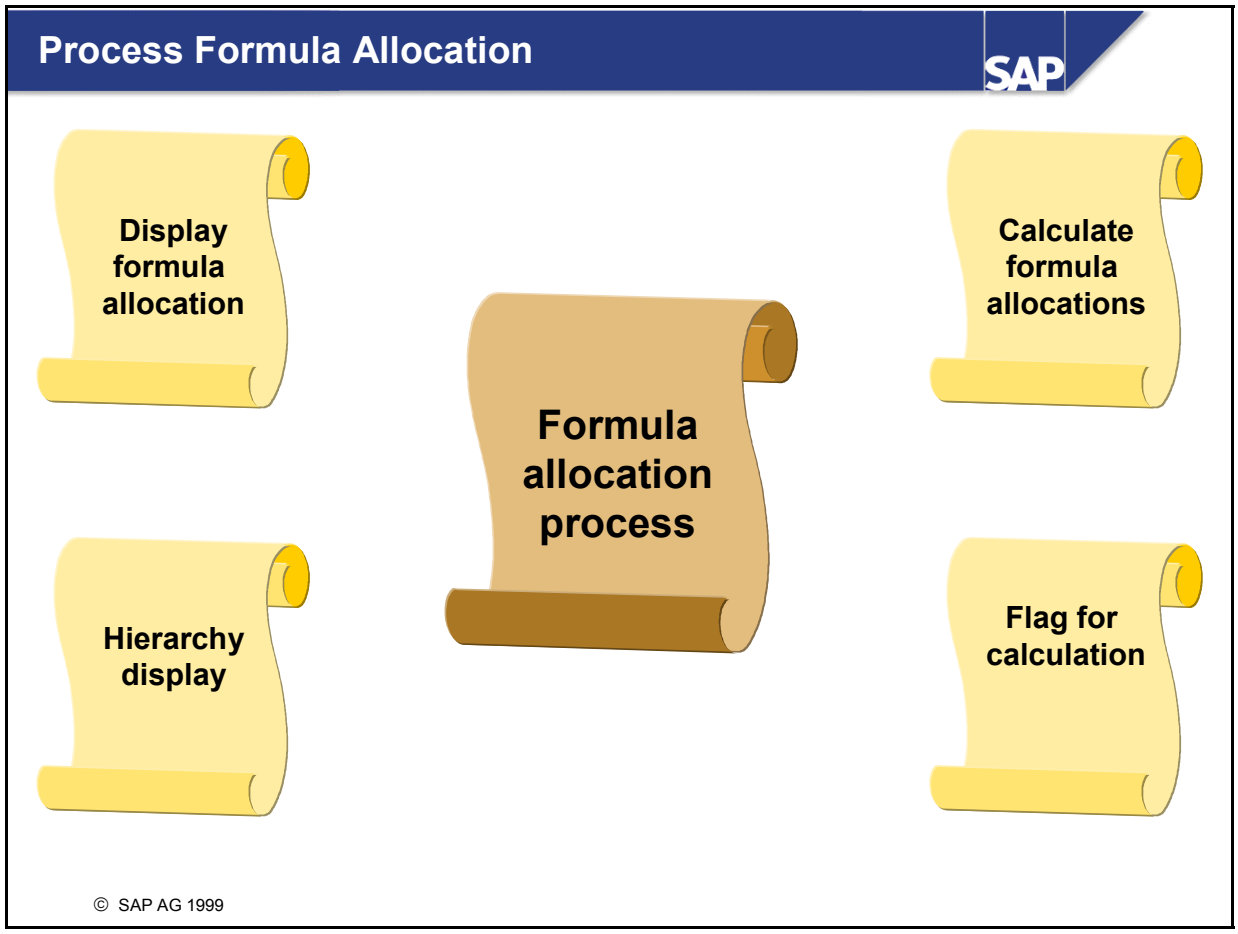
Formula Profiles: Calculation Workbench

- Formulas and Formula Profiles
- Elements of a Formula Profile
- Calculation Workbench



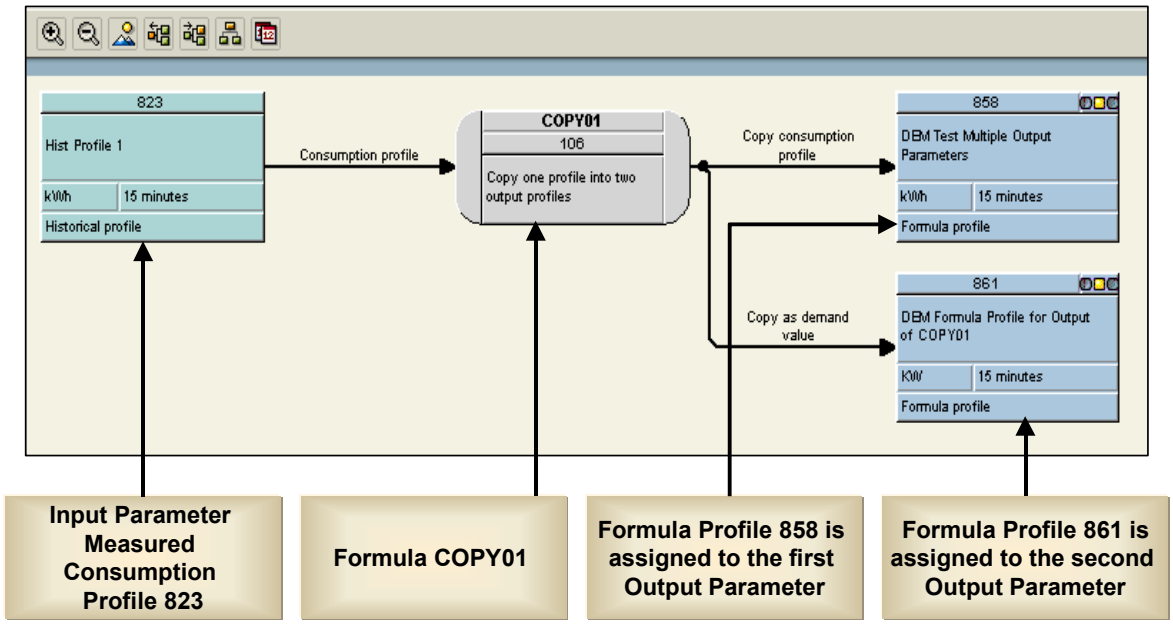
- To call up the Calculation Workbench, choose *Utilities Industry -> Energy Data Management -> Automatic Profile Calculation -> Calculation Workbench.*
- The Calculation Workbench is the gateway to calculating, processing and monitoring formula profile calculations. It includes the following:
  - Process formula allocation
  - Calculation trigger
  - Asynchronous calculation
  - Current calculation run



■ **Process formula allocation**

- *Display formula allocation* shows the allocation via the *Display profile header* screen.
- Using *Calculate formula allocation* (synchronous calculation), you can calculate a formula allocation synchronously for a certain period. This also includes all inactive, dependent formula allocations with triggering functions.
- *Flag for calculation*: Generates a calculation trigger.
- *Hierarchy display*: Allows the user to see the formula allocation in a graphic, to better understand the relation between the profiles.
- *To and From Date* (time slices are calculated at the same time).

Process Formula Allocation: Display Hierarchy



- Users are able to see the Profiles assigned to the particular Formula Allocation by selecting the ‚Display Hierarchy‘ pushbutton within the Calculation Workbench.
- For example, take the sample discussed earlier for Formula COPY01. Note the information entered in the Profile Header screen and how it looks in this hierarchical representation.

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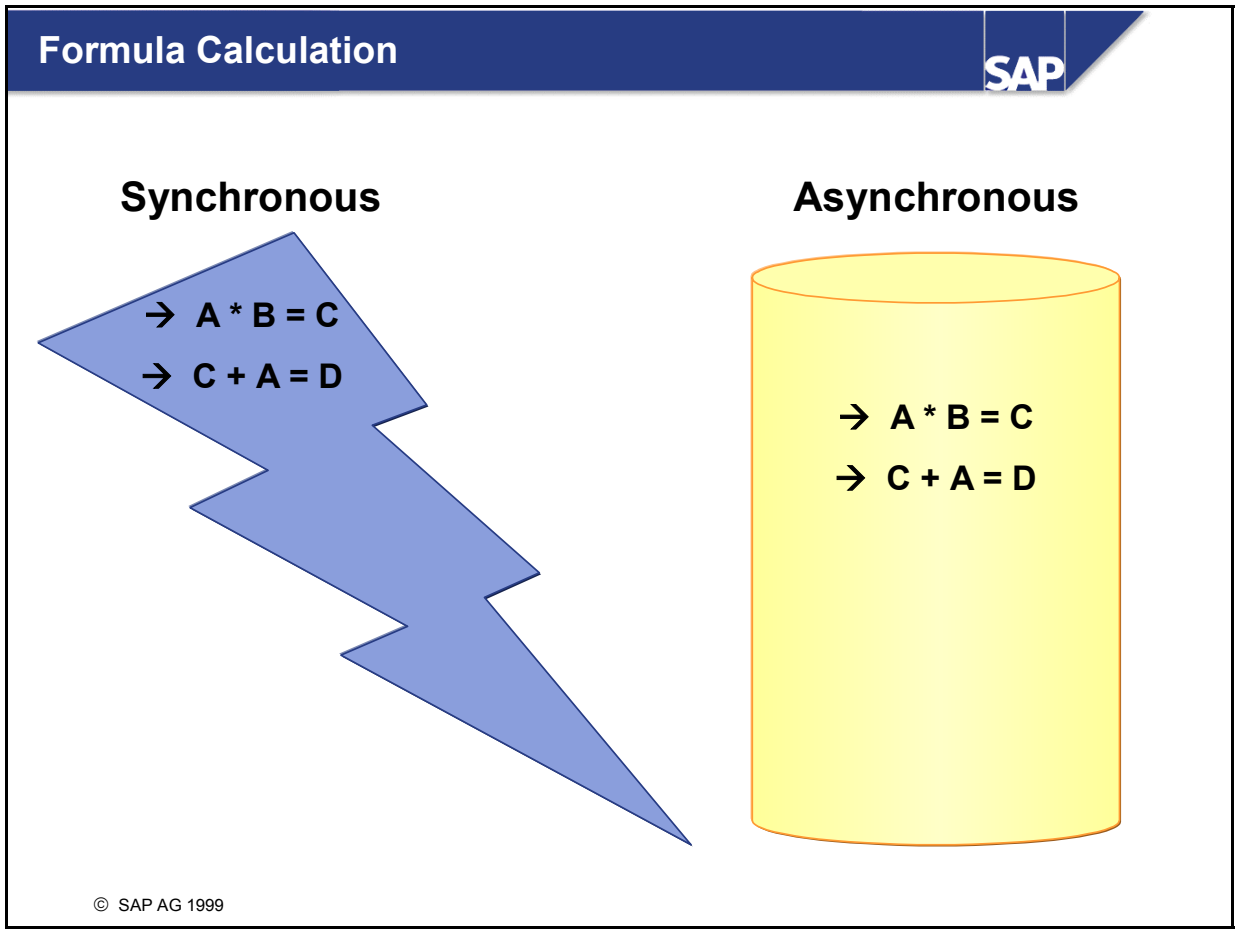
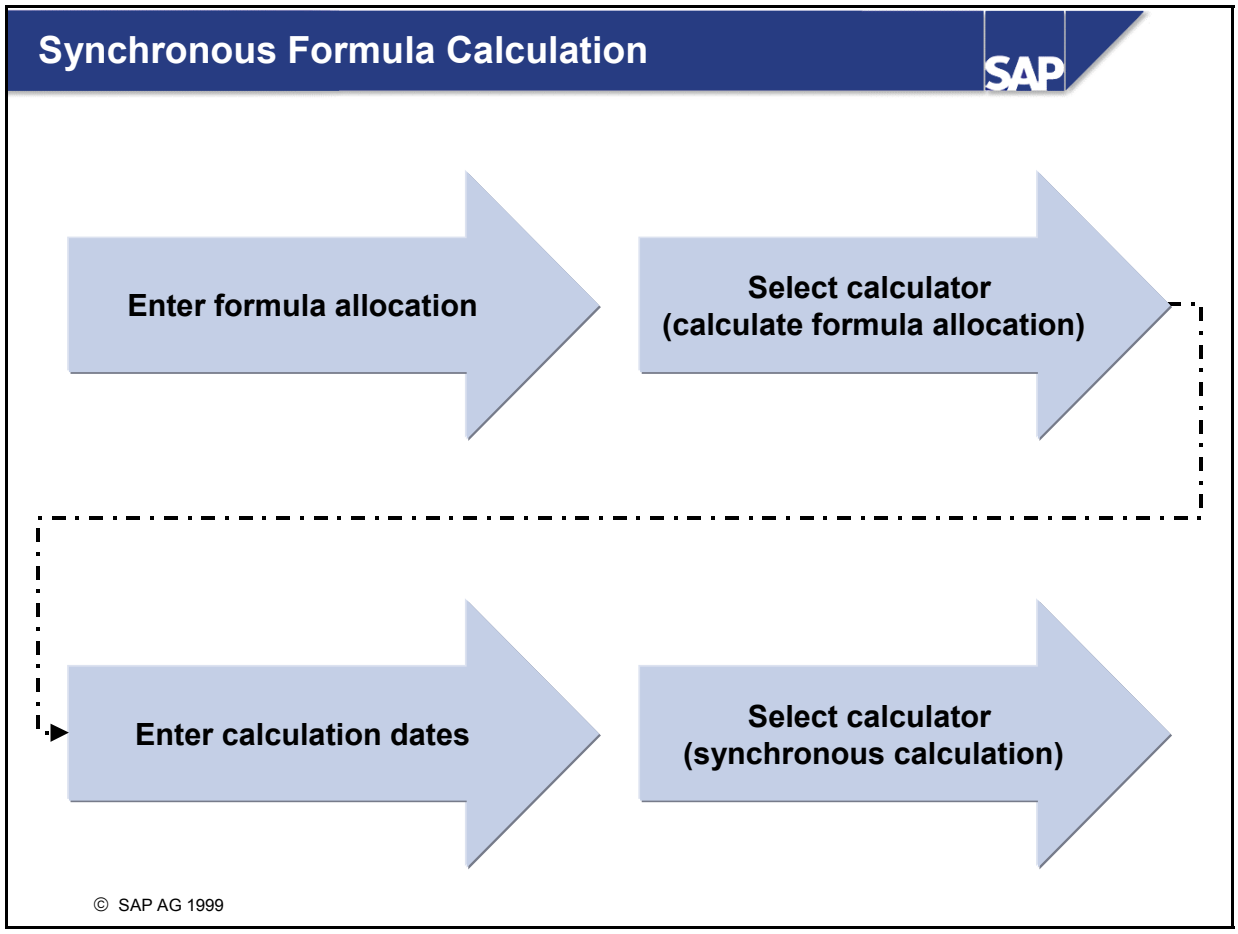


- **Asynchronous Calculation**: **Formula profile calculation** analyzes the dependent **formula allocations** based on the compressed calculation triggers, and starts parellel calculation of the profiles.
  - It is executed in the background on the specified servers as many times as the number of jobs you have selected per server.
  - It is performed on several servers and processors per server for optimum system performance
  - It is locked for other users while a calculation run is taking place. If a calculation run has not been successfully completed, the lock is not removed from the calculation run. When monitoring the calculation, you can remove the lock and restart the calculation run.

    Note: As a prerequisite for the profile calculation, you must compress the calculation trigger



- **Synchronous Calculation**: The immediate calculation of the formula profile - triggered by the user.
  - Enter the formula allocation and choose *Calculate Formula Allocation*.
  - Selected formula allocation and all inactive formula allocations beneath it in the hierarchy are calculated.
  - This allows the user to make single formula calculations.
  - Allows calculation of a single formula profile allocation within a dependent formula.
- When the *Calculator* pushbutton is selected from the Calculation Workbench, the *Calculation Status for Formula Profiles: Details* screen is shown.
  - The To and From dates are entered.
  - The status of the calculation is displayed.
- The log is displayed once the calculation is over. It contains messages indicating whether the calculation was executed successfully or with errors.
- After the profile has been calculated, in the profile header, *Details* tab page, you can see the calculated-to date, which shows the last date the formula was calculated.

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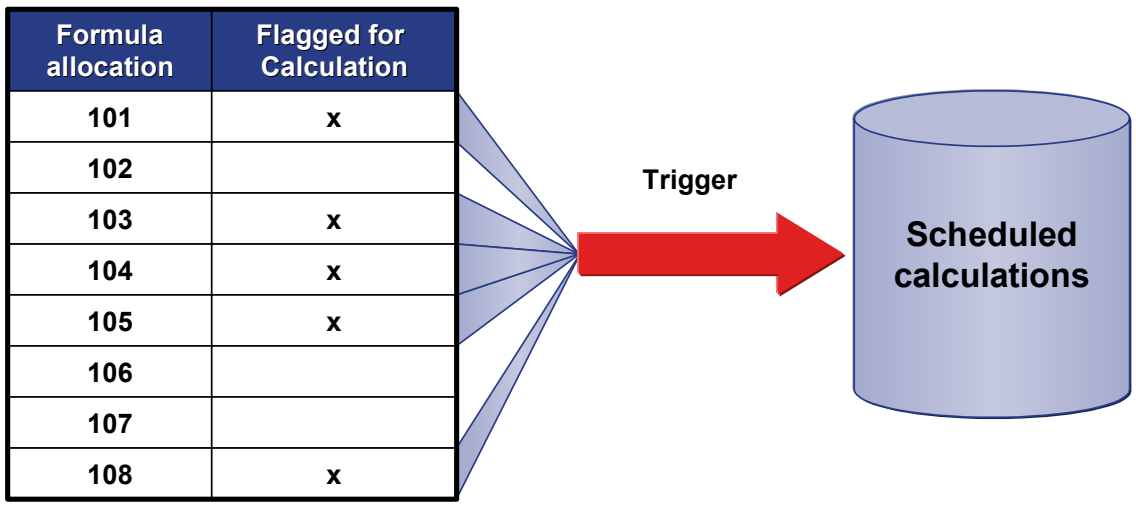
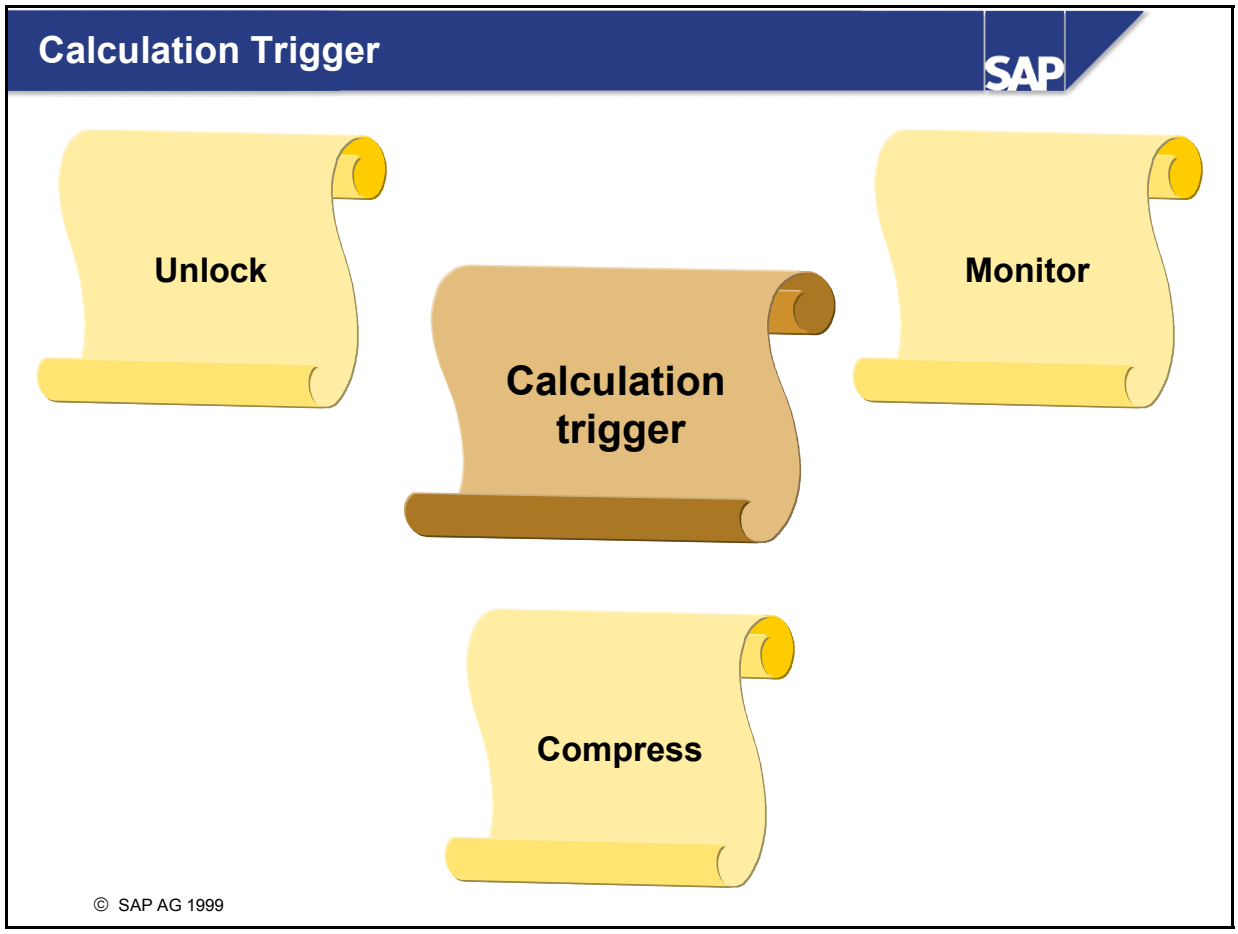
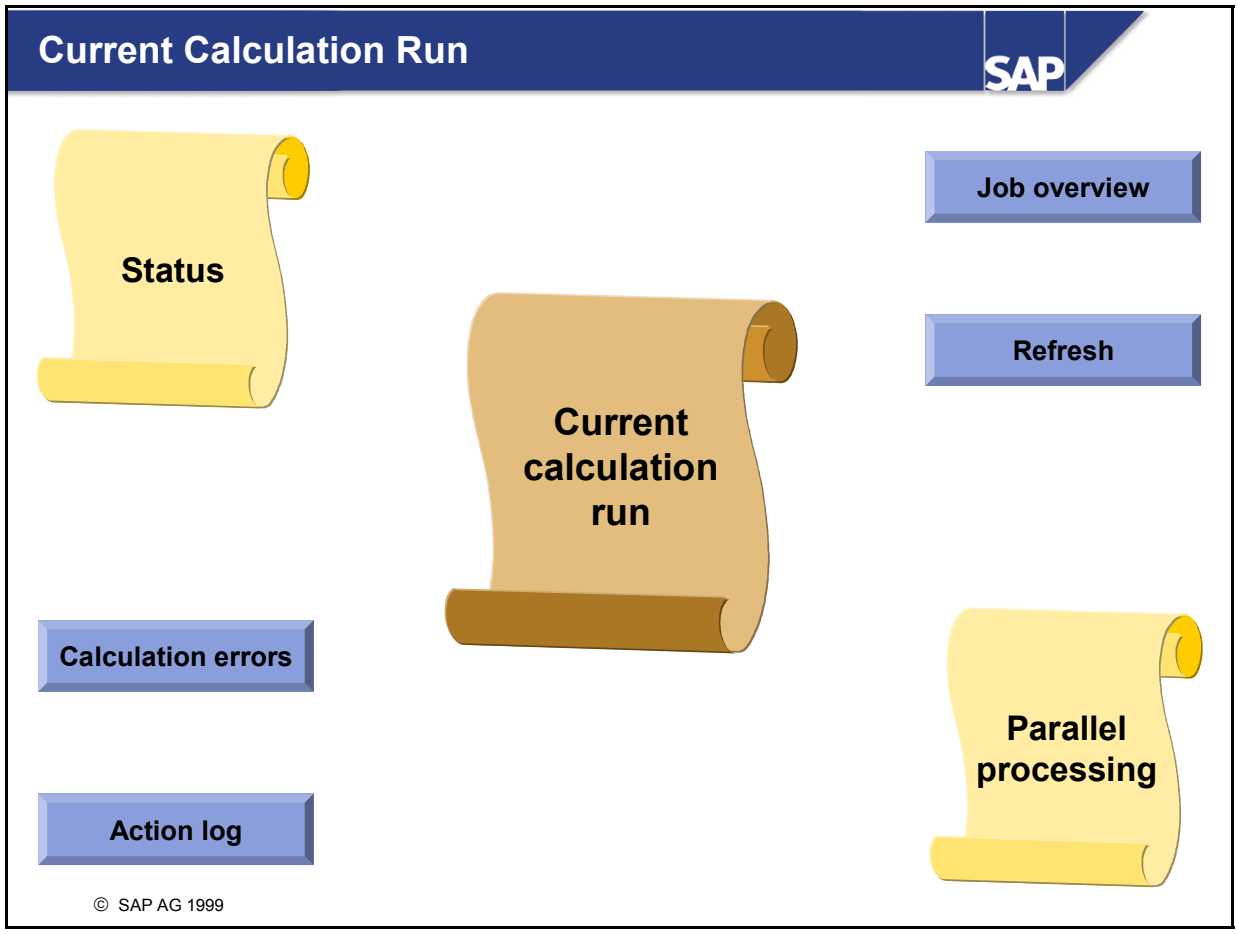
Asynchronous Formula Calculation



- **Asynchronous Calculation** is the scheduled calculation of formula profiles. The calculation run takes into account all formula allocations, for which calculation triggers exist.
  - Choose the *Schedule Calculation* pushbutton in the Calculation Workbench.
  - *Schedule Calculation Run* starts the calculation run.
  - *Unlock* is used to unlock calculations with errors.
- Note: Parallel processing of the scheduled calculation runs is possible.



- The **calculation trigger** must be compressed to run the formula calculations.
- Because only completed formula allocations and not individual profiles are calculated, the temporary triggers are compressed at the level of the total formula allocation. Compression of the calculation trigger is a prerequisite for asynchronous calculation of formula allocation.
- The calculation triggers are compressed with regard to the formula allocation number, and the from- and to-date.
- To calculate formula allocations that are connected as regards time and hierarchy in parallel, without causing locks, the data must first be put into an appropriate form as regards time and hierarchy.
- *Unlock Compression*: The compression is locked while the calculation trigger is being compressed, so that no other compression can be started at the same time. If errors occur during the process, compression remains to locked. You can, however, remove the lock manually.
- *Monitoring calculation triggers*: Allows user to monitor the compression.



- The *Current Calculation Run* dialog box displays information about the current calculation run.
  - Header data:
    - Calculation run number, Restart number, Create dates, User ID for creator
  - Status: Monitor status on the run, or manually change the status of the calculation run.
  - Parallel processing
    - Interval length or number of intervals, server name and number of jobs
  - For more information about the calculation run, see the *Calculation Errors, Job Overview* and A*ction log* pushbuttons.

Exercises

Unit: Formula Profiles

Topic: Formula Profiles

At the conclusion of this exercise, you will be able to:

- Create a formula profile
- Run the calculation workbench

Formula profiles contain values that are determined on the basis of a calculation rule. The calculation rule is a formula that converts the different input parameters into output parameters, according to a mathematical algorithm.

1-1 Create a formula profile.
To create a formula profile you must first create a profile with a profile type that refers to the *Formula Profile* category. In the SAP menu choose ***Utilities Industry→ Energy Data Management → Profile Management → Profile Header → Create***.

1-1-1 Create a formula profile for the electricity division and use formula profile group 0## as the profile name.

1-1-2 In the *General* tab page, select the following entries in the *Profile Data* group frame:

Profile type:	*Formula profile*
Valid from:	01.01.2001
Valid to:	31.12.9999

In the *Value Data* group frame select the following entries:

PV category:	*QUANTITY*
MeasUnit for MR:	*kWh*
Interval length:	*15 Minutes*
Decimal places:	*7*

1-1-3 Choose the *Details* tab page and enter the following data:

Formula:	*LIMIT01*
Status group:	All values → Valid
From-date:	01.01.2001

1-1-4 For the input and output parameters, allocate the third output parameter (P*ortion above first limit*).

Double click on input parameter 01 *Measured value*.

Choose *Create Allocation* and allocate the measured profile for your group number.

Allocate profile 25 to the *First Limit Value as Quantity*.

Allocate profile 50 to the *Second Limit Value as Quantity*.

Choose *Enter*. (Note: Make a note of your formula allocation number).

1-2 Perform synchronous calculation for the formula allocation that you have just created. Choose the calculation workbench from the SAP menu under ***Utilities Industry → Energy Data Management → Profile Calculation → Calculation Workbench***.

Note:
You can also choose *Hierarchy Display* to view your formula allocation as a graphic.

1-2-1 Enter the formula allocation number. Enter the calculation dates 01.01.2001 to 31/01/2001. Choose *Calculate Formula Allocation*.
You reach the *Calculation Status for Formula Profiles: Details* screen. Either select the lines with the formula allocation that is to be calculated, or enter a period (for which the calculation is to be executed) in the *Restrict* S*ynchronous Formula Calculation* group frame, and choose *Synchronous Calculation.*

1-2-3 Display the log.

1-3 Display the formula profile values from 01.01.2001 to 31.01.2001.

1-3-1 Display the results. The input data is defined as follows in the formula profile:

Description	**Values**
Measured profile	Your measured profile
1. profile	25 kWh
2. profile	50 kWh
Output profile	Portion above first limit

What was the first occurrence of a value that is above the first limit?

_____

_____

_____

What are the date, time and value of the result?

_____

_____

_____

Can you explain the results for this interval?

_____

_____

1-4 Additional exercise: Allocate multiple output parameters to the formula allocation.

1-4-1 Allocate other output parameters to the formula profile that you created earlier.

Solutions

Unit: Formula Profiles

Topic: Formula Profiles

1-1 Proceed as described in the exercise.

1-2 Perform synchronous calculation for the formula allocation that you have just created.

1-2-1 Proceed as described in the exercise.

1-2-3 Proceed as described in the exercise.

1-3 Display the formula profile values from 01.01.2001 to 31.01.2001.
In the SAP menu, choose ***Utilities Industry→ Energy Data Management → Profile Management → Profile Values → Display***.

1-3-1 Enter the formula profile and 01.01.2001 – 31.01.2001 as the selection date for the calculation.

What was the first occurrence of a value that is above the first limit?

What are the date, time and value of the result?

Field name or data type	**Values**
Value	2.04
Date	10.01.2001
Time	06:45:00

Can you explain the results for this interval?

The output profile created from the formula allocation was allocated to the *Portion above first limit* output parameter. Since the first limit value is 25, all values from the measured profile that are above 25 will result in output values from the formula calculation. In other words, values above the limit of 25 are calculated as follows:
Measured value – Limit value = Output result.
The formula calculation for this interval leads to this result because on 10.01.2001 at 06:45:00, the profile value in the measured profile is
27.04 – 25 = 2.04

1-4 Additional exercise: Allocate multiple output parameters to the formula allocation.

1-4-1 Proceed as follows:

Create the profile header for the second output parameter but this time, enter the formula allocation number from step one in the *Formula Allocation* field.
Note: You can use the *Possible Entries* function (F4) to find the formula allocation.
Choose *Enter*
Click the *Expand All* pushbutton to display the allocation of the profile to the output parameter.
To allocate more output parameters, follow these steps again until all output parameters have been allocated.

Choose *Enter*.

Synthetic Profiles: Unit Contents

- Definition and Use of a Synthetic Profile
- Synthetic Profile Structure
- Generation of Synthetic Profile
- Allocating a Synthetic Profile

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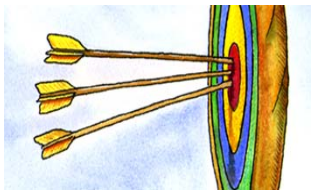
Synthetic Profiles: Unit Objectives

At the conclusion of this unit, you will be able to:

- **Describe the difference between standard load profiles and synthetic profiles.**
- **Define season, day and time of use (TOU) types and groups.**
- **Generate synthetic profiles**
- **Adjust and standardize synthetic profiles**
- **Explain the function of the usage factor.**
- **Allocate profiles to an installation**



Synthetic Profiles: Definition and Use of Synthetic Profiles

- Definition and Use of Synthetic Profile
- Synthetic Profile Structure
- Creating a Synthetic Profile
- Allocating a Synthetic Profile

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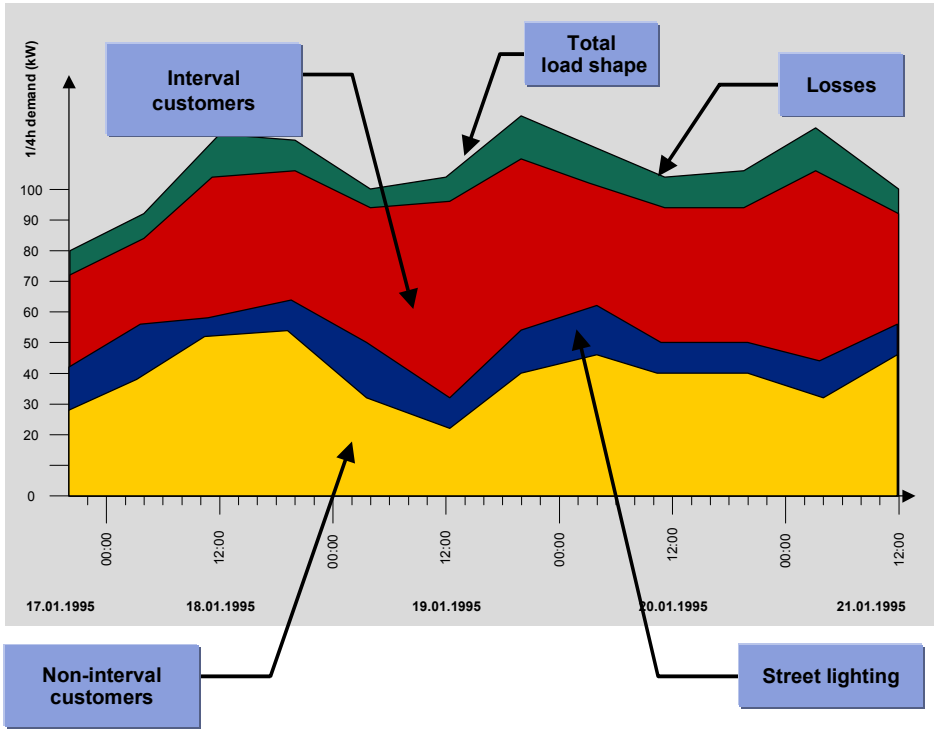
Synthetic Profiles (I)



- **Synthetic profiles** (Standard load profiles) are used in some energy markets if customer consumption is not determined using an interval reading.
- In Germany, for example, the German Electricity Association (VDEW) has a number of different customer groups. In the USA, customers are grouped together based on their consumption patterns. In order to do this, interval meters are installed at a representative customer from each group for a specific period of time. Overall consumption patterns are then calculated using these sample measurements.

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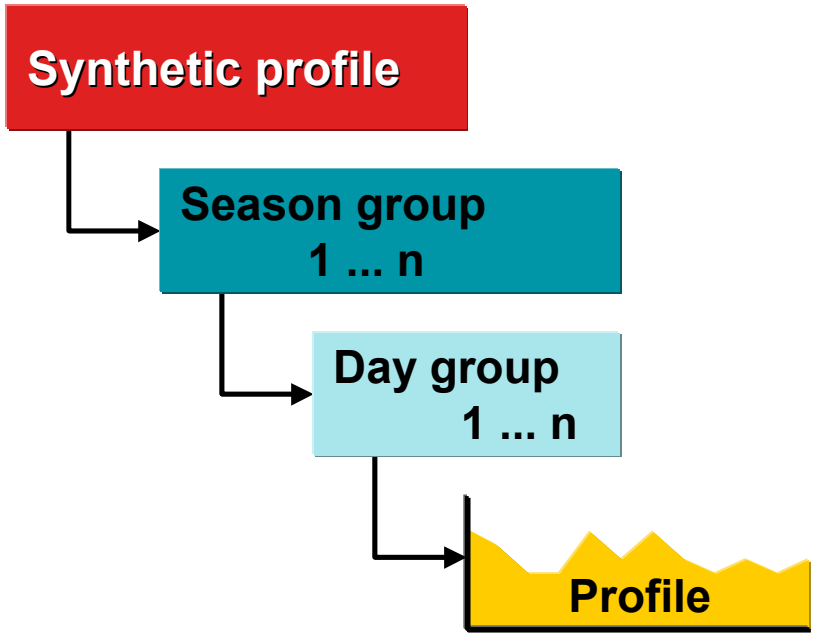
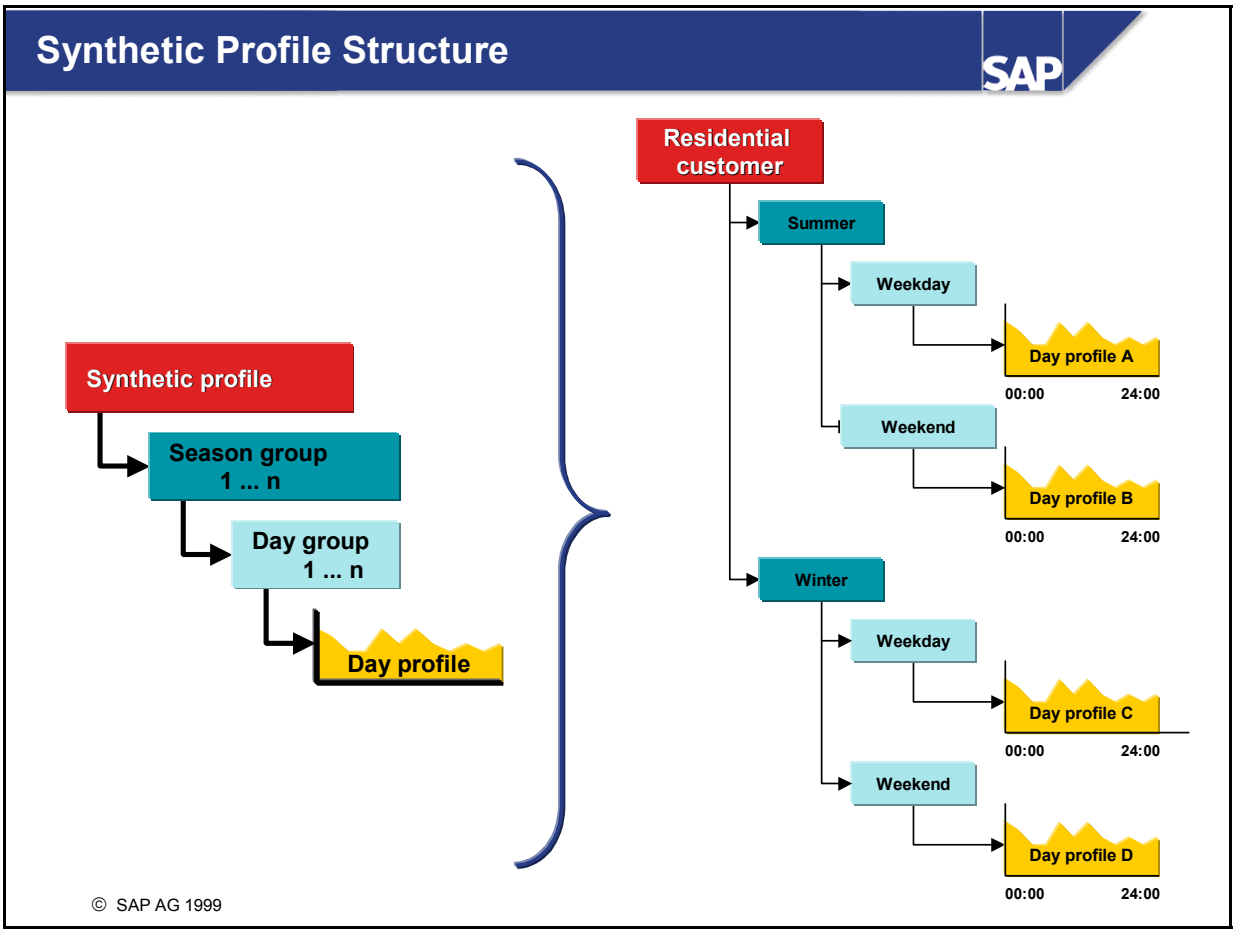
Synthetic Profiles (II)



- A **Synthetic Profile** is a profile that contains values generated on the basis of predefined periods (defined by day and season groups) and corresponding day and annual profiles. It is used when no interval readings are available to classify the consumption patterns of groups of customers. Customers groups (those customers with similar consumption patterns) are assigned the same synthetic profile.
- Two further characteristics of a synthetic profile that will be discussed in this unit are:
  - **Dynamic modification factors**
  - **Usage factors**

Synthetic Profiles: Synthetic Profile Structure

- Definition and Use of Synthetic Profile
- Synthetic Profile Structure
- Creating a Synthetic Profile
- Allocating a Synthetic Profile



- Synthetic profiles can be made up of hierarchy structures. Components within this hierarchy are:
  - Season Groups
  - Day Groups
  - Profiles
- You can adjust season groups, day and time-of-use groups in Customizing*: SAP Utilities -> Energy Data Management -> Basic Settings*
- You must establish day, season and TOU settings before you can generate synthetic profiles.
- Note: These settings are also required in the RTP-Interface where they define the structure of RTP components. This will be covered in detail in *IUT 235: Real-Time-Pricing*.

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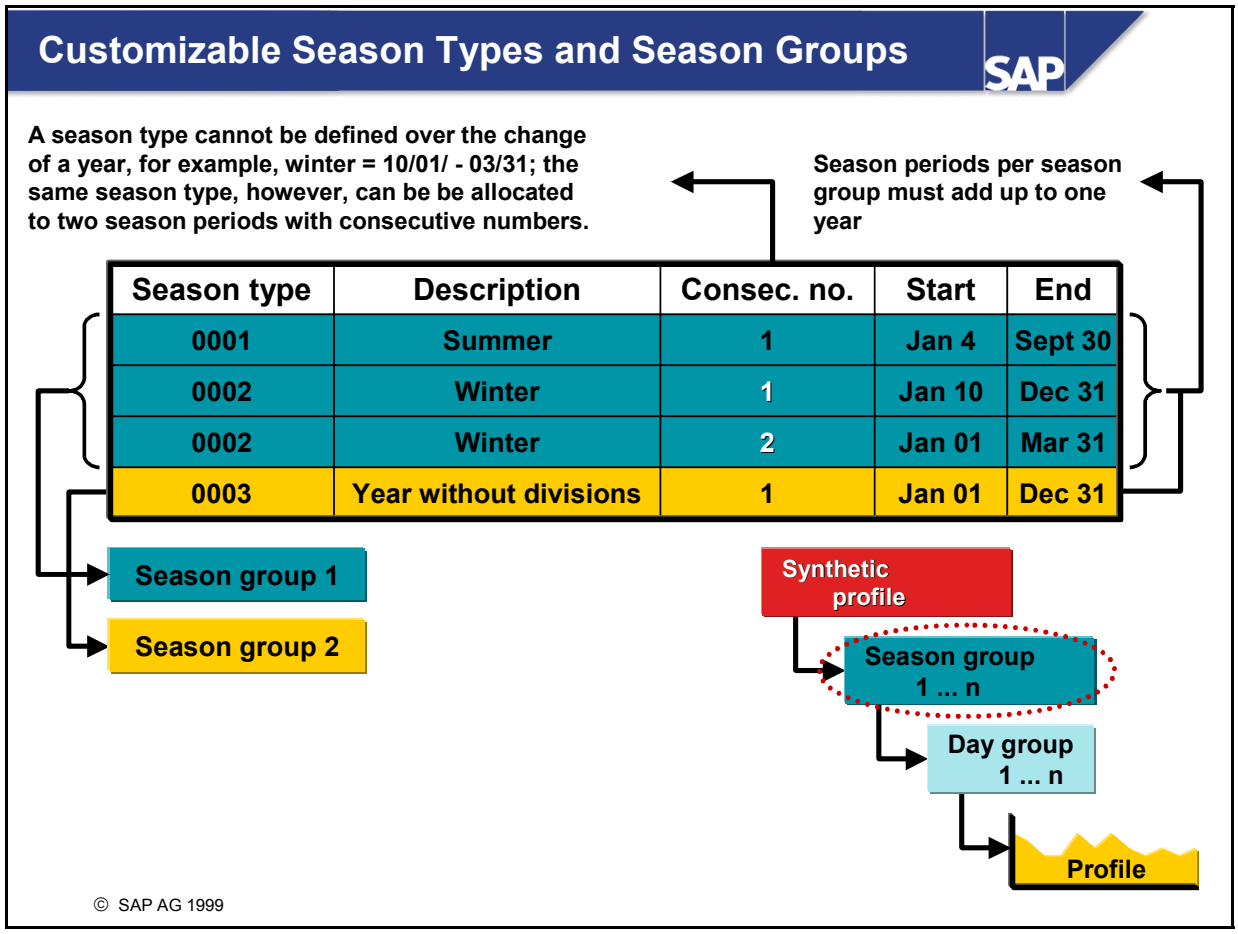

- **Season types** describe a recurring period within a year. Season periods are allocated to a season type. In the example above, the following Season Types have been customized:
  - Season type **Summer (0001)** describes the season period from 04/01 to 09/30.
  - Season type **Winter (0002)** describes the season period from 01/01 to 12/31. **(Consecutive number 1) and the period from 01/01 to 03/31. (consecutive number 2)**.
- **Season groups** describe the division of the year into season types.
  - The season periods allocated to the season types in the season group must total one year (01/01 to 12/31) and cannot overlap.
  - For example, to divide a year into summer and winter, define a season group that contains the season types summer (to which you allocate the season period 04/01 to 09/30)and winter (to which you allocate the season periods 10/01 to 12/31 and 01/01 to 03/31).

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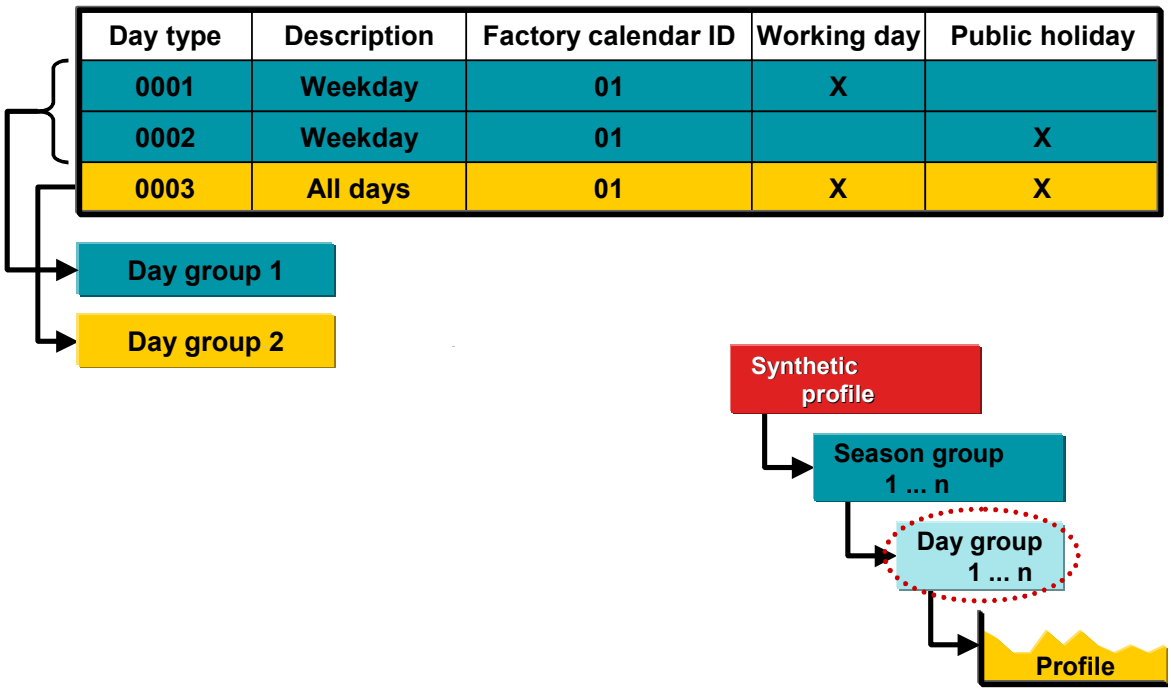
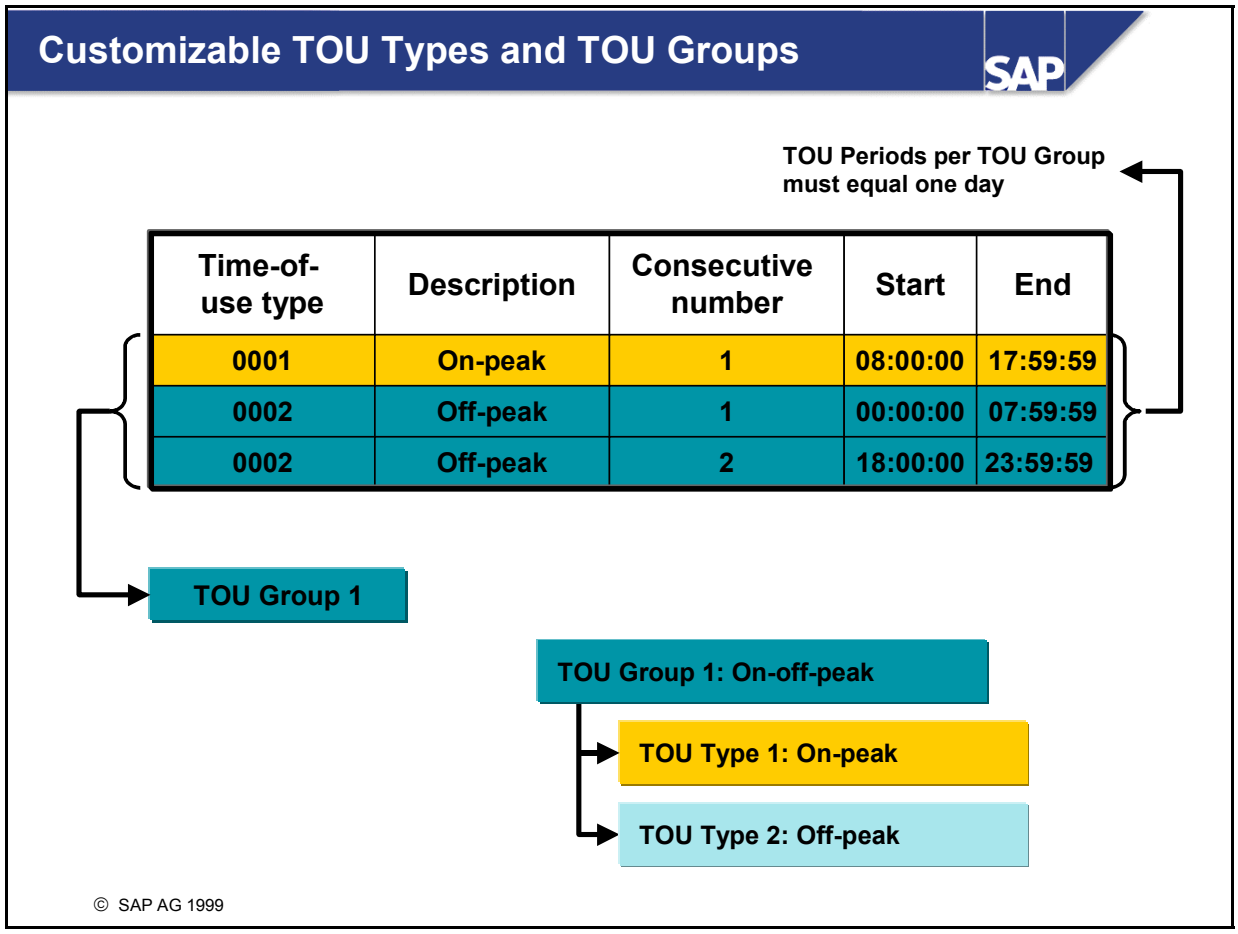
Customizable Day Types and Day Groups



- **Day types** define days based on the factory calendar.
  - In the **Factory Calendar**, Monday through Friday are defined as working days and Saturday, Sunday, and public holidays are defined as non-working or weekend days. A factory calendar is based on a public holiday calendar.
  - In the example above, the week is divided into weekdays and weekend days and the following customized day types are defined:
    - Weekday with reference to the workdays in factory calendar 01, this means Monday through Friday.
    - Weekend with reference to the public holidays in factory calendar 01, this means Saturday, Sunday, and public holidays.
    - Other day types can also be customized.
- **Day groups** contain different day types.
  - Day group 1 includes weekdays (day type 0001) and weekends (day type 0002).
  - Day group 2 includes all days (day type 0003).
- Note: If different day types are defined based on different factory calendars, all of the factory calendars must refer to the same public holiday calendars.



- **Time of Use Groups** consist of Time of Use Types.
- **Time of Use Types** are defined and assigned to a Time of Use Group. For example:
  - The TOU period from 08:00:00 to 17:59:59 is allocated to TOU type 0001 (on-peak rate period)
  - TOU periods from 00:00:00 to 07:59:59 and 18:00:00 to 23:59:59 are allocated to TOU type 0002 (off-peak rate period)
- In order to set up the TOU Group, the Time of Use Types On-Peak and Off-Peak are allocated to a **TOU Group**. In the above example, TOU Group On-Off Peak consists of on- and off-peak time periods as defined in the TOU type.

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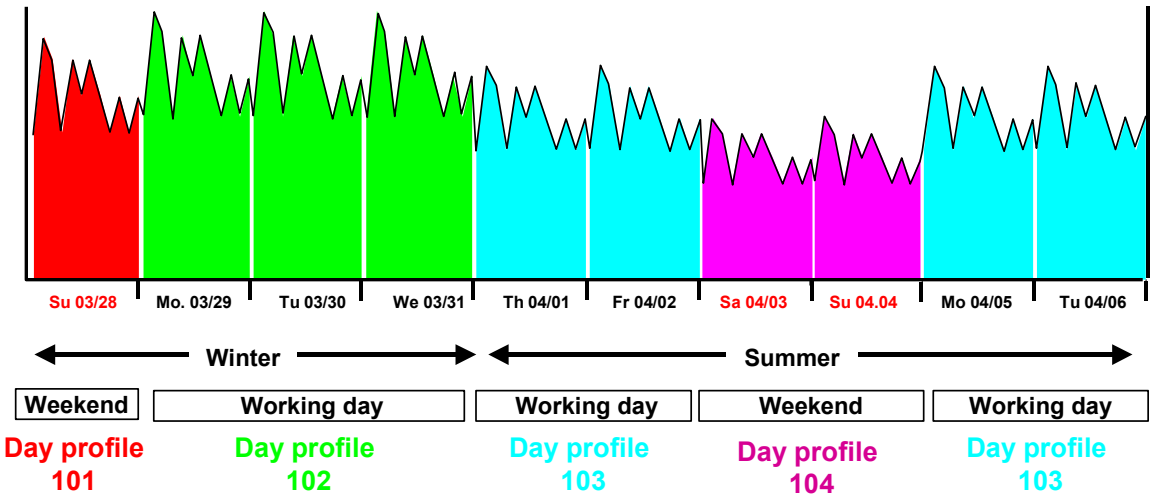
Generation of Synthetic Profile



- Synthetic profile values are determined using reference measurements or statistical methods and are saved as a day profile in the Energy Data Repository.
- Based on the allocation of season, day and TOU groups, a synthetic profile structure is generated.
- During the generation of the synthetic profile, the day profiles (standard load profiles) are determined according to the hierarchy. The profile values are then transferred to the synthetic profile according to the hierarchy settings.

Synthetic Profiles: Creating a Synthetic Profile

- Definition and Use of Synthetic Profile
- Synthetic Profile Structure
- Creating a Synthetic Profile
- Allocating a Synthetic Profile

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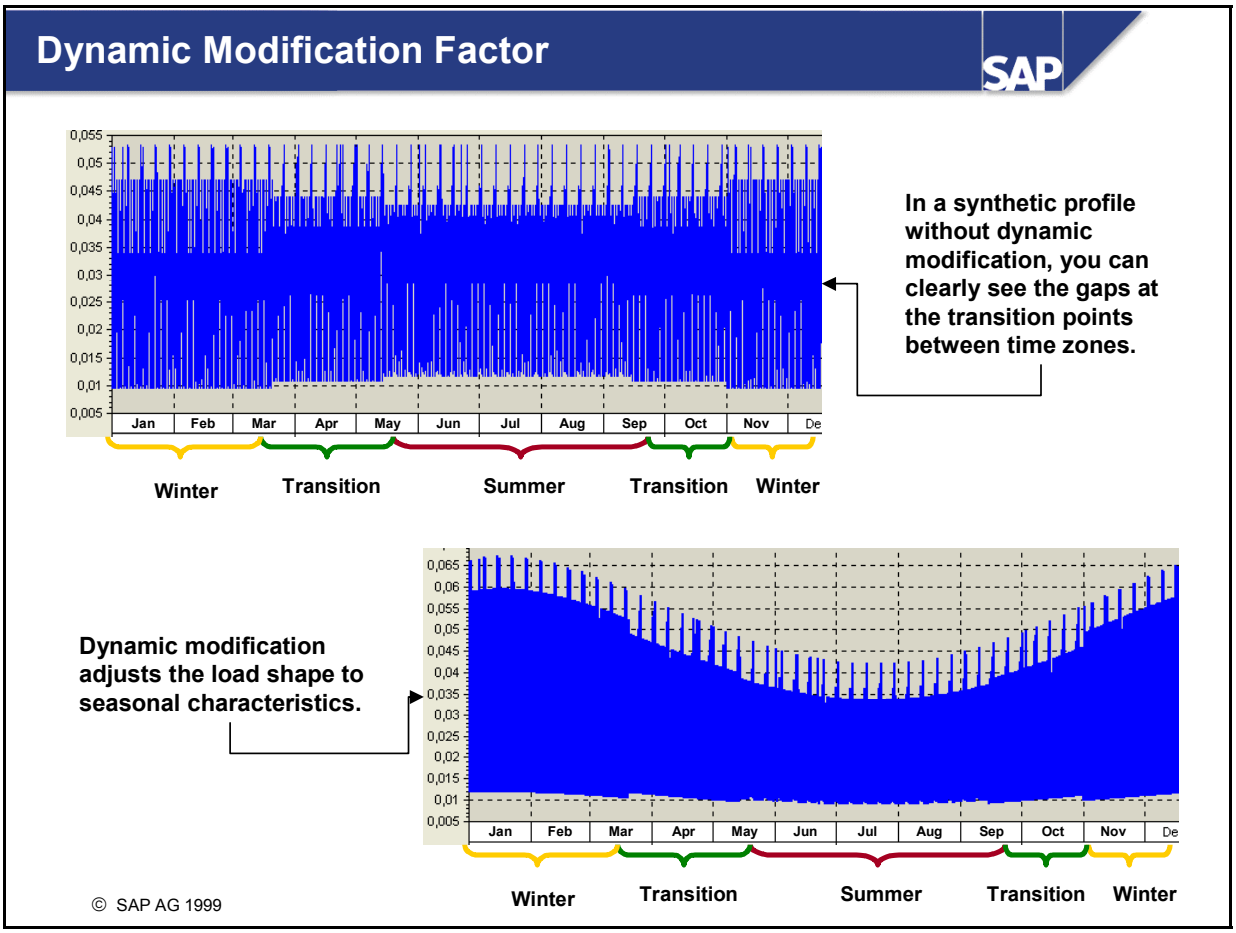

- **Dynamic Modification Factors** are used to modify a customer or customer group's synthetic profile to represent the temperature impacts throughout the year. This process is known as dynamic modification and guarantees a typically stable load shape.
- Dynamic modification factors are generated in EDM.
- Note: SAP delivers a dynamic modification function. This function complies with the standards of the German Electricity Association (VDEW).
- You can find this function in Customizing under *SAP Utilities -> Tools -> System Modifications -> User-Defined Enhancements for Energy Data Management -> Dynamic Modification Function for Synthetic Profiles -> Define Functions for Calculating Dynamic Modification Factors*.

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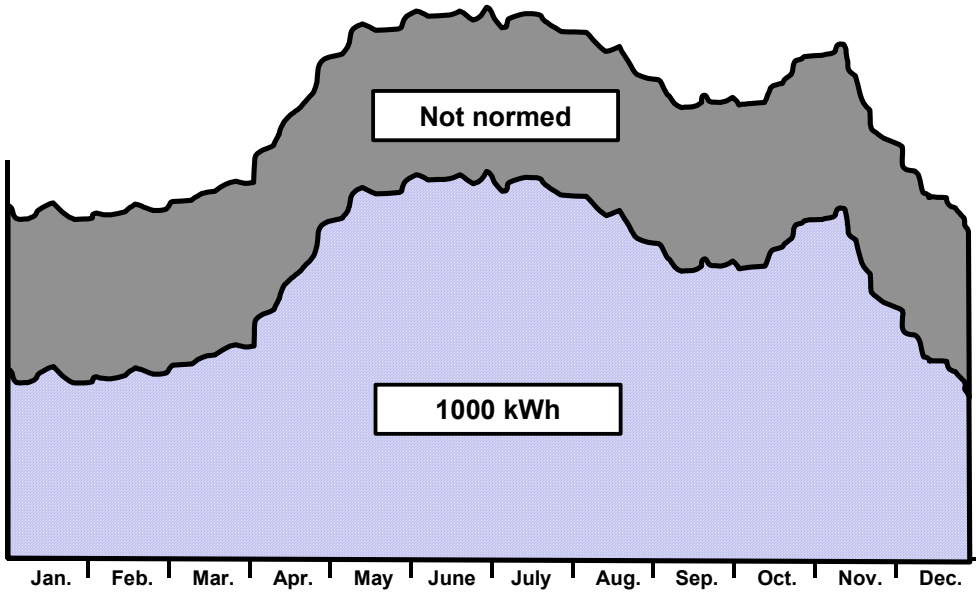
Norming



- Synthetic profile values can be normed in relation to a given consumption amount, or a **fixed reference value,** for a given time period of time. In this way a total consumption is used to create a synthetic profile based on the day profiles attached to it.
- Normalization is possible for one year or one month. You can norm a synthetic profile for a year, for example, where the sum of the values is 1000 kWh (reference value) over the period.
- Note: Values can only be generated for a period many times greater than the period length for norming.
- In the example above, the synthetic profile is normed at 1000 kWh per year.

Synthetic Profiles: Allocating a Synthetic Profile

- Definition and Use of Synthetic Profile
- Synthetic Profile Structure
- Creating a Synthetic Profile
- Allocating a Synthetic Profile

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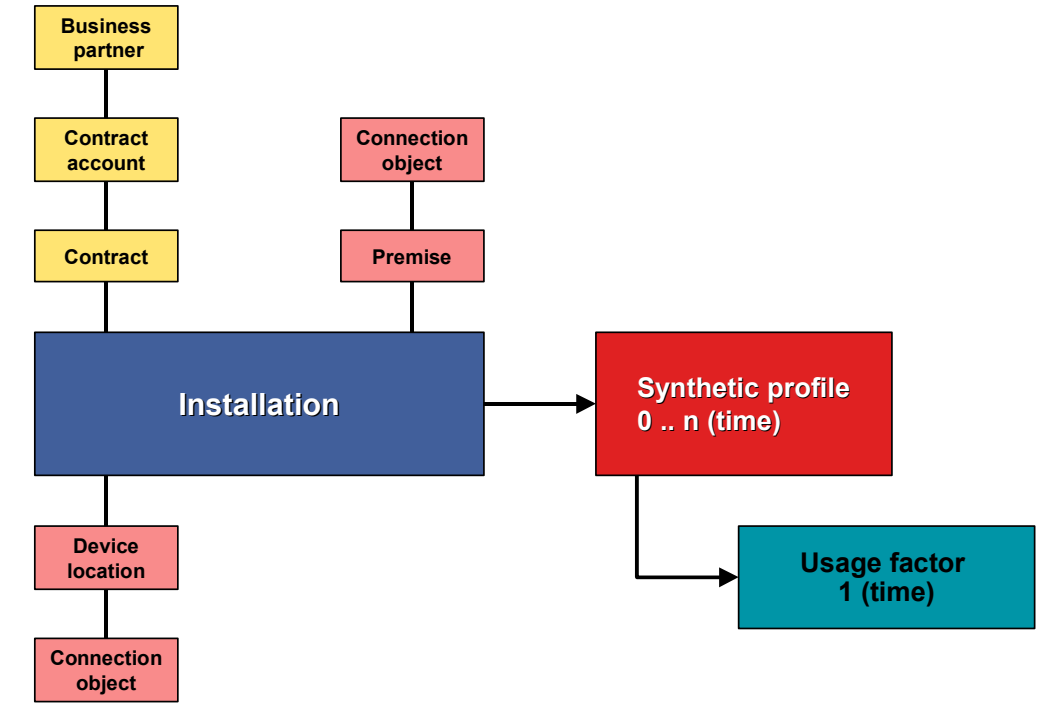
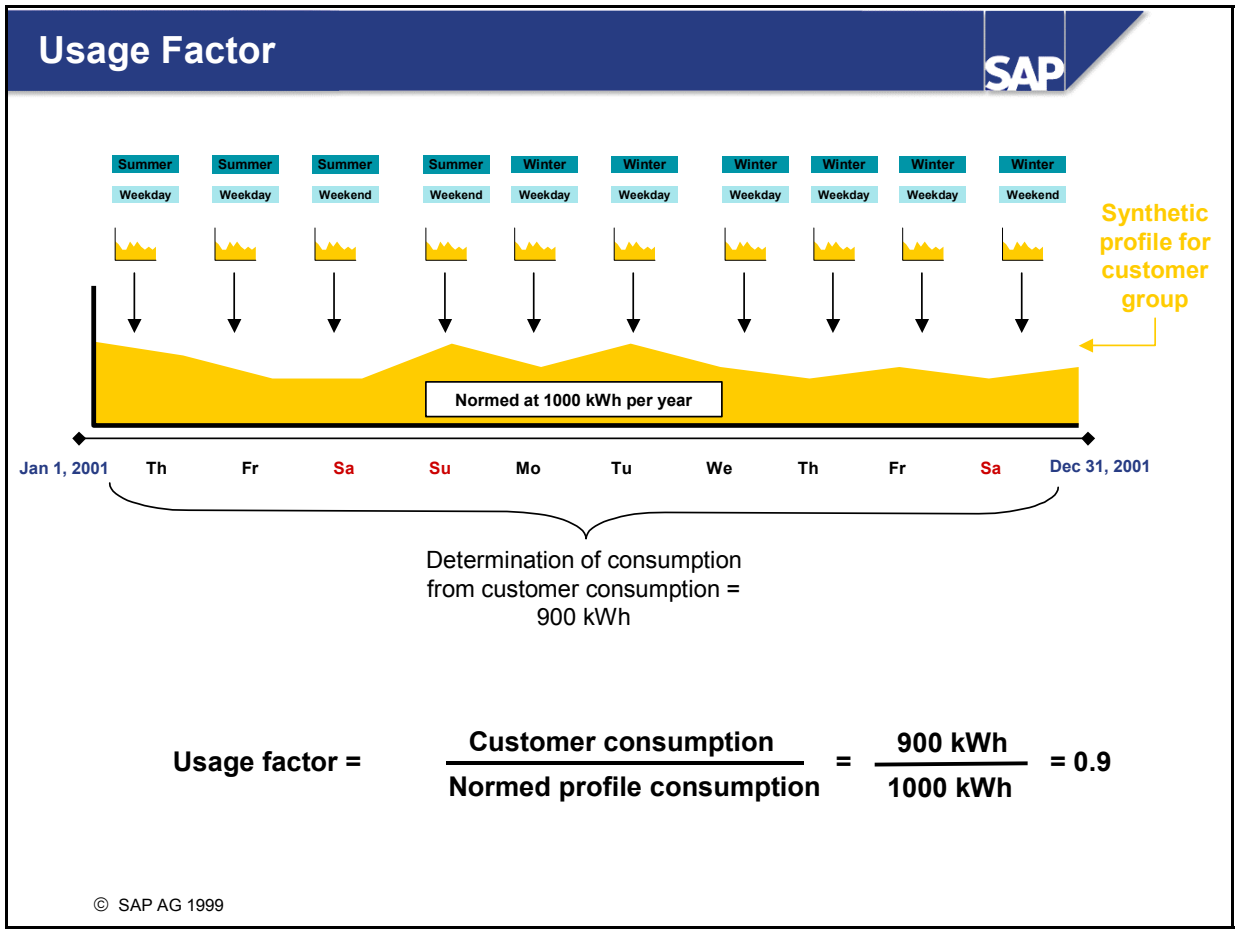
Allocating a Synthetic Profile



- Synthetic profiles are allocated to the installation via roles.
- Different synthetic profiles can be allocated to one installation.
  - For example, synthetic profiles can be used in both billing and settlements.



- The **usage factor** represents the relationship between customer consumption and normed consumption values from the synthetic load profile.
- In the example above, the synthetic profile is normed at 1000 kWh. The actual consumption of the customer is 900 kWh. The usage factor is automatically determined by dividing the customer consumption by the normed value of the synthetic profile.
  - Usage Factor = 900 kWh / 1000 kWh = 0.9
- Usage factor is updated
  - Usage factors are automatically calculated and updated via consumption quantity determination in IS-U Billing. The billing period in which the consumption accumulates is taken into consideration. It is possible to specify for each synthetic profile of the installation whether the consumption quantity determination updates the usage factor or not.

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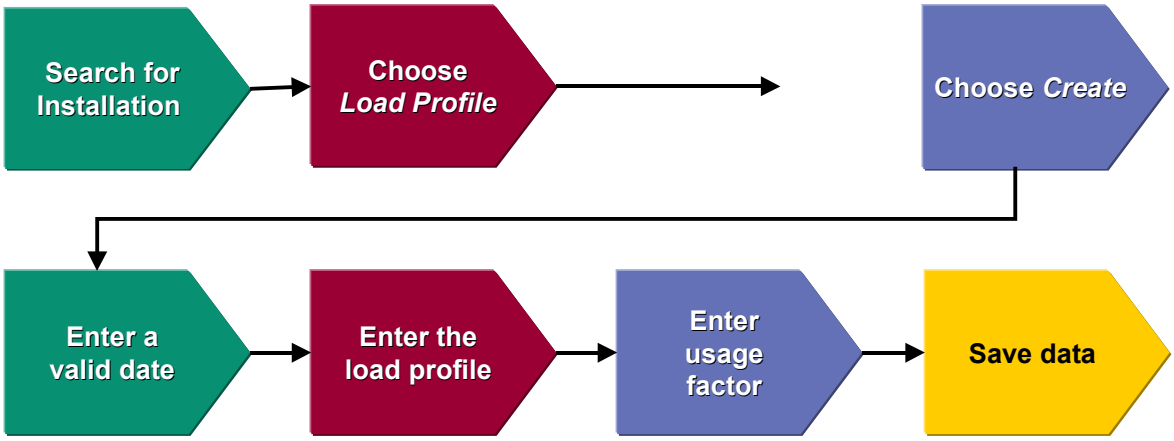
Allocating a Profile to an Installation

- ***Technical Master Data -> Installation -> Change***



Note: You can also allocate a profile allocation role

- Select *Load Profile* in the *Installation -> Create* or *Change* transaction
- Choose *Create*
- Enter a start and end validity date for the allocation
- Enter the load profile to be allocated
- Enter the usage factor

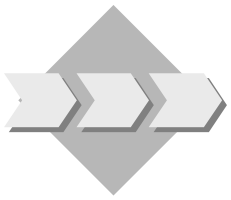
Exercises

Unit: Synthetic Profile

Topic: Create a Synthetic Profile

At the conclusion of this exercise, you will be able to:

- Create a synthetic profile
- Generate profile values
- Allocate a synthetic profile to an installation
- Display the profile values of a synthetic profile



A synthetic profile must be defined for the installation belonging to business partner *TP0101A0##*. In order to do this, you must create a new profile header and generate values for it.

1-1 Create a synthetic profile.

1-1-1 Enter the profile description *synthetic load profile group ###*.
Select the division *electricity* and enter the following data in the tab page *general*:

Profile type:	*Synthetic Profile*
Valid From and Valid To:	*01.01.2000, 31.12.9999*
Interval length:	*15 Minutes*
Profile value category:	*QUANTITY*
MeasUnit for MR:	*Quantity*
Decimal places:	*7*

Save the profile. Make a note of the profile number:

_____

1-1-2 Enter the following details on the *Details* tab page:

Season groups: 0003 (year divided into summer, winter, trans)
Day group: Day Group: 0003 (Weekdays, Saturdays, Sundays)
Norming: *Normed for one year*
Reference Value: 1000
Dynamic modification factors: *Profile 118*

In the *Generate or Display Profile Values* box, enter *From Date* 01/01/2000 and *To Date* 31/01/2001.

Allocate day profiles to the corresponding season and day groups using the chart below. Select the day group and choose *Create Allocation*.

Day profile	Working day	Saturday	Sunday
Summer	**105**	**103**	**104**
Winter	**102**	**100**	**101**
Transition	**108**	**106**	**107**

1-2 Generate the profile values.

The synthetic profile created above was normed for one year. You must, therefore, generate profile values for a year.

Optional step:

1-2-1 You can select the tab page with the *Excel symbol* and view the profile values you have just generated

1-3 Allocate the load profile you have just created to the installation *TP0101A0##*.

1-4 Display the profile values from 01.01.2001 to 31.12.2001 for the synthetic profile created in the previous exercise.

Solutions

Unit: Synthetic Profile

Topic: Create a Synthetic Profile

1-1 Create a synthetic profile. Choose from the SAP menu ***Utilities Industry → Energy Data Management → Profile Management → Profile Header → Create***.

1-1-1 Proceed as described in the exercise.

1-1-2 Proceed as described in the exercise.

1-2 Generate the profile values.

The synthetic profile created above was normed for one year. You must, therefore, generate profile values for a year. In the *Generate or Display Profile Values* box, enter *From Date* 01/01/2000 and *To Date* 31/01/2001.

Choose *Generate Profile Values*.
The status of the profile values generated will appear yellow
Save your entries.
The profile value status is now green.

1-3 Allocate the load profile you have just created to the installation *TP0101A0##*.
Go to the SAP Menu and choose ***Utilities Industry → Technical Master Data → Installation → Change***.

Enter the installation.

Field name	Values
Installation	TP0101A0##

Choose *Load Profile*. This takes you to the *Load Profile* initial screen. In the *Allocate Load Profile* box, choose *Create*.

Enter a usage factor:

Field name	Values
Usage factor	1.1

Enter the synthetic profile created in the previous exercise in the *load profile* field:

Select a role from the profile allocation.

Choose *Enter*. Note that the usage factor and status that you entered manually automatically appear in the *Load Profile Factor* box. This box is updated whenever a new usage factor is entered - manually or automatically - via billing

1-4 Display the profile values from 01.01.2001 to 31.12.2001 for the synthetic profile created in the previous exercise.

In the SAP menu choose ***Utilities Industry→ Energy Data Management → Profile Management → Profile Values → Change***.

Enter the number of the synthetic profile you created in the previous exercise.

Enter the selection date 01/01/2001 to 31/12/2001 and choose *Enter*. The profile is displayed in the navigation area.

Select the field next to the profile. Profile values are displayed in the work area. You can view the profiles in table form or as a graphic.

Note:
You can view different profiles simultaneously in both table form and as graphics. To do this, enter the profile number in the profile field. Choose enter and, in the navigation area, select the field next to each profile you want to view.