

Intermediate Schema for Data Migration

- General Requirements
- Simplifications and Assumptions
- Exporting From the Old Billing System
 - Matching Tables Obligatory for Exporting
 - The Customer Statuses Registry
 - The Network Services Registry
 - The Units Registry
 - The Services and Price Plans Registry
 - The Currency Registry
 - The Types of Equipment Registry
 - The Provider Equipment Registry
 - The Customer Groups Registry
 - The Bank Registry
 - The Account Types Registry
 - The Identification Document Types Registry
 - Optional Matching Tables
 - The Phone Number Types Registry
 - The Street Address Binding Types Registry
 - The Payment Types
 - The Multi-Subsidiary Structure
 - Tables Containing Data for Migration
 - The Customers and Basic Subjects Registry
 - The Accounts Registry
 - Grouping Customers
 - The Customer Premises Equipment
 - The Customer Subscriptions to Network Services and Applications Access Credentials
 - The Contracts
 - Subscribing Customers to Services
 - The Payments
 - The Chargings
- Additional Tables
 - The Multiple Comments
 - Addresses
 - Parsed addresses for basic subjects
 - Parsed CPE addresses
 - Parsed phone numbers of basic subjects
 - Matching exported customers against those in Hydra
 - Division employees



ER-diagram of the intermediate schema tables is available here: <https://dbdiagram.io/d/5fca9ba19a6c525a03b9da84>

General Requirements

Data migration from other billing systems is carried out via making tables for an intermediate dataset in the CSV format.

- Encoding is UTF-8 without BOM
- Field separator is a semicolon
- Field values are enclosed in double quotation marks (including empty values as empty quotes ("");)
- Field names for the table are entered in the first row
- Primary keys (ID fields) and external keys (*_ID fields) should be numeric
- Every table should be exported as a separate CSV file. The filename is equal to the table name and filename extension is csv.
- All of the exported files have to be packed into a ZIP archive. The archive may contain only the exported files in CSV format.

Example — file **ACCOUNTS.csv**:

```
"ID","USER_ID","ACC_NUM","ACC_TYPE_ID","CUR_ID","BANK_ID","BALANCE","CREDIT","CREDIT_END_DATE","  
BALANCE_DATE"  
"1001","101","123456","1","1","","","926,07","500","","23.09.2017 23:59:59"
```

Next, using a special tool, the CSV files are uploaded to the Hydra Billing for further reference data matching and the actual database migration.



For the fields of Date and Time type, two formats are possible:

- With time portion: **26.04.2009 13:04:55** (in Oracle — **DD.MM.YYYY HH24:MI:SS**). Time can be specified without minutes or seconds, the missing values are considered to be equal to zero.
- Without time portion: **26.04.2009** (in Oracle — **DD.MM.YYYY**). In this case, time is considered to be equal to midnight.

Date type fields accept only one format: **26.04.2009** (in Oracle — **DD.MM.YYYY**).

Simplifications and Assumptions

1. Organizations and individuals are stored in the same table (USERS) and can be differentiated by a special feature (USERS.JUR field).
2. Only the name of an organization is shown from its address and bank details, the rest is to be input manually (if necessary, add custom fields with the details to the table).
3. The current amount of consumed services (traffic, minutes) does not migrate, but the end date of the current billing period does.
4. Service providing settings (recurrence, quotas, units, costs, etc.) do not migrate, they should be input manually and then matched.

Exporting From the Old Billing System



You can add the **REM** custom field to each table for exporting useful text data. The data exported into it will become a comment to the corresponding entity: a customer, an equipment, a contract, etc.



The primary key in each table is always named **ID**

Matching Tables Obligatory for Exporting

Listed in this section are the tables with the data which is not migrated, but is used for matching the values in the Migration application of the system being migrated against customer statuses in Hydra.

The Customer Statuses Registry

The **STATUS** table

Field	Description
ID	The ID of a status
NAME	The name of a status

In the simplest case, there are only two statuses in the registry (activated, deactivated).

The Network Services Registry

The **NS_LIST** table

ID	The ID of a network service
NAME	The name of a network service

Note: this registry is created manually and contains a list of network services: RADIUS, Customer Self-Care Portal, telephony, email, etc. To access them, a customer requires a password and a login.

The Units Registry

The **UNITS_LIST** table

ID	The ID of a unit
NAME	The name of a unit

Note: the values are matched against the units registry in Hydra.

The Services and Price Plans Registry

The **SERVICES** table

ID	The service ID (the price plan ID)
NAME	The service name (the price plan name)
TYPE	The price plan feature (Y for a price plan; N for a service)
UNIT_ID	The unit ID — with the reference to UNITS_LIST.ID

Note: the values stored in this registry are not migrated, but they are matched against the Product catalog entries (`TYPE = "Y"` entries are to be matched with **Everything Price plans** group items, and `TYPE = "N"` entries — with **Everything Services** ones).

The Currency Registry

The **CURRENCY** table

ID	The currency ID
NAME	The currency name

Note: the values are matched against the units registry in Hydra.

The Types of Equipment Registry

The **EQUIP_TYPE** table

ID	The type ID
NAME	The equipment name

Note: the values are matched against the product catalog entries, typically against those in the Active equipment section.

The Provider Equipment Registry

The **OP_EQUIP** table

Field	Description	Comment
ID	The equipment ID	
EQUIP_TYPE_ID	The equipment type ID	A link to <code>EQUIP_TYPE.ID</code>
CODE	The equipment code	
IP	The management IP address	
FIRM_ID	The division ID	A link to <code>FIRMS.ID</code> . Used only in case of a multi-subsiary migration

Note: The table is used for correct bindings to provider equipment already exported into the system. When starting the migration section of the provider equipment the matching is carried out based on the exported data.

The Customer Groups Registry

The **GROUPS** table

ID	The group ID
NAME	The group name

Note: the values are matched against the groups registry. If there are no groups in your system, it still makes sense to add such values in the registry, and bind all customers to groups depending on their categories, for example, Individuals, Organizations, Employees, etc.

The Bank Registry

The **BANKS** table

ID	The bank ID
NAME	The bank name

Note: the values are matched against the bank registry. Consequently, the banks that come up while exporting should be added into Hydra manually.

The Account Types Registry

The **ACC_TYPES** table

ID	The account type ID
NAME	The account type

Note: the values are matched against the account types registry.

The Identification Document Types Registry

The **AUTH_DOC_TYPES** table

ID	The document type ID
NAME	The document type

Note: the values are matched against the identification document types registry

Optional Matching Tables

When setting up correct default control values, it is not obligatory to export tables from this section.

The Phone Number Types Registry

The **PHONE_TYPES** table

ID	The phone number binding type ID
NAME	The binding type (Mobile, Home, Office, etc.)

Note: the values are matched against the address types registry.

The Street Address Binding Types Registry

The **FACT_ADDR_BIND_TYPES** table

ID	The street address binding type ID
NAME	The binding type (Street, Service address, etc.)

Note: the values are matched against the address types registry.

The Payment Types

The **PAYMENT_TYPE** table

ID	The payment type ID
NAME	The payment type name
VIRTUAL	Select "Y" if this is an adjustment payment

Note: the registry is used for differentiating payments of different types (adjustment payments, cash, bank transfer, JSIP, Visa, Webmoney, etc.) which is useful for creating reports.

The Multi-Subsidiary Structure

In case of a multi-subsidiary structure, you should use the subsidiaries registry to which the **FIRM_ID** fields in the **USERS** and **OP_EQUIP** tables are linked.

The **FIRMS** table

ID	The subsidiary ID
NAME	The subsidiary name

It is matched against the company structure.

Tables Containing Data for Migration

Use the data in the following tables when migrating to create entities of the necessary type.

The Customers and Basic Subjects Registry

The **USERS** table

Field	Description	Comment
ID	The customer ID	
STATUS_ID	The customer status ID	A link to STATUS.ID. A basic subject is always created with the <i>Active</i> status.
BASE_ID	The basic subject ID	A link to USERS.ID of a basic subject (a separate entry in the table). It is usually exported empty in order to create bindings automatically.
LOGIN	The customer code	A unique short name used to identify a customer.
JUR	Individual or organization (0 — individual, 1 — organization).	
NAME	Full name (for an individual)/ Name (for an organization).	
ADDR	The street address format is: <City>,<Street>,<Building>,<Entrance>,<Floor>,<Apartment>,<Intercom code>	If some data is not available then leave empty between commas, <i>for example, Pittsburgh city of, Harrow Hill Rd., 5,,,78,5apt234</i> The street number can be used together with the building number: <i>Pittsburgh city of, Harrow Hill Rd., 5 bld. 7,,,78,5apt234</i>
ADDR_REM	Comments to a subject's address	
AUTH_DOC_TYPE_ID	The ID document type	A link to AUTH_DOC_TYPES.ID
AUTH_DOC_SERIALIZED	The document series	
AUTH_DOC_NO	The document number	
AUTH_DOC_DATE	The document issue date	The DD.MM.YYYY date format.
AUTH_DOC_ISSUE	Issued at/by	
D_BIRTH	The date of birth	The DD.MM.YYYY date format.
BIRTH_PLACE	The place of birth	
INN	Individual Taxpayer Identification Number (ITPN / TIN / Tax Id)	
OPF	The legal form of an organization, for example, sole proprietorship, LLC	The legal forms are not matched. The value from the legal forms registry is matched by the name.
W_PHONE	Contact office phone number	Digits only, starting with a country code, e.g. 78122128506. It is possible to enter several numbers separated by a comma.
H_PHONE	Contact home phone number	Digits only, starting with a country code, e.g. 78122128506. Only for individuals that have 0 in the JUR column. It is possible to enter several numbers separated by a comma.
M_PHONE	Contact mobile phone number	Digits only, starting with a country code, e.g. 78122128506. It is possible to enter several numbers separated by a comma.
EMAIL	Contact Email address	It is possible to enter several addresses separated by a comma.
FIRM_ID	The subsidiary ID	The link to FIRMS.ID. Is used only for migration with multiple subsidiaries.

Note: the list of customer personal data attributes is extendable if necessary.

The Accounts Registry

The **ACCOUNTS** table

Field	Description	Comment
ID	The account ID	
USER_ID	The customer ID	A link to USERS.ID
ACC_NUM	The account number	
ACC_TYPE_ID	The account type ID (a personal account, an operating account, etc.)	A link to ACC_TYPES.ID
CUR_ID	The currency ID	A link to CURRENCY.ID (if the system uses only the Russian ruble, then it is not necessary to specify)
BANK_ID	The bank ID	A link to BANKS.ID (for personal accounts - leave empty).
BALANCE	The account balance	
CREDIT	The current credit of a customer	Fill in if a credit is required. If not — leave empty.
CREDIT_END_DATE	The credit limit end date and time.	If empty, but the credit value is entered in CREDIT, then the credit is permanent.
BALANCE_DATE	The date and time for the balance to be calculated.	DD.MM.YYYY HH24:MI:SS Note that all payments from PAYMENTS that arrive after the date and time specified here will be added to the balance specified in ACCOUNTS.BALANCE.

Grouping Customers

The **GROUPLINK** table

Field	Description	Comment
ID	The linking record ID	
USER_ID	The customer ID	A link to USERS.ID
GROUP_ID	The group ID	A link to GROUPS.ID
MAIN	The main group feature - 'Y'	It is used to mark the main group when linking a customer to several groups. There should be only one main group.

Note: if there are no groups in the system used for exporting, then at least you should divide all exported customers into three groups: organizations, individuals, and employees. I.e. you need to add these three groups to the **GROUPS** table and specify links to them (specify who to add to a group according to certain criteria when exporting)

The Customer Premises Equipment

The **EQUIP** table

Field	Description	Comment
ID	The equipment ID	
USER_ID	The customer ID	A link to USERS.ID
EQUIP_TYPE_ID	The CPE type ID	A link to EQUIP_TYPE.ID
OP_EQUIP_ID	Provider equipment ID	A link to OP_EQUIP.ID
OP_EQUIP_PORT	Provider equipment port number (code)	
OP_EQUIP_PORT_TYPE	Provider equipment type code	The value is matched by code as similar port types of different equipment are considered different entities in the system structure
NS_ID	ID of the network service for equipment management	A link to NS_LIST.ID. Typically not used - leave empty
CODE	The equipment code	A unique short name used to identify equipment
MAC	The MAC address formatted as 01-23-45-67-89-AB	Separate multiple values with a comma

IP	The IPv4 address or subnet (CIDR notation)	Separate multiple values with a comma
IP6	The IPv6 prefix	Separate multiple values with a comma
PHONE	The customer phone number	Digits only, starting with a country code, e.g. 78122128506. Separate multiple values with a comma
ADDR	The service address	The address is unloaded in the same format as USERS.ADDR
ADDR_REM	Comments to the service address	

Note: **OP_EQUIP_ID**, **OP_EQUIP_PORT**, **OP_EQUIP_PORT_TYPE** fields are used for specifying the CPE binding to provider's equipment and are optional.

The Customer Subscriptions to Network Services and Applications Access Credentials

The **NETSERV** table

Field	Description	Comment
ID	The binding ID	
USER_ID	The customer ID	A link to USERS.ID
NS_ID	The network service ID	A link to NS_LIST.ID
EQUIP_ID	The customer equipment ID	A link to EQUIP.ID It is filled in only for subscriptions to services which require specifying equipment. In the application access rows (for example, to the Customer Self-Care Portal) this field should be empty.
LOGIN	The login	The login should be unique in terms of the network service.
PASS_WORD	The password	Plaintext password or its hash.
PASS_TYPE	The password hashing type	Leave empty for plaintext. Encryption types are not matched. The value from the registry of supported hash types for passwords is matched according to the name: SHA1, MD5, etc.

Note: the login and passwords for VPN, Customer Self-Care Portal, SIP account and other resources controlled by the Billing are exported into this table. For security reasons, during test exporting, passwords can be substituted with asterisks or random rows. Authentic passwords are to be exported only once, during the final migration.

The Contracts

The **CONTRACTS** table

Field	Description	Comment
ID	The contract ID	
USER_ID	The customer ID	A link to USERS.ID
NUM	The contract number	
D_DOC	The date of the contract	
D_BEGIN	The begin date of the contract	
D_END	The end date of a contract	

Subscribing Customers to Services

The **SUBSCR** table

Field	Description	Comment
ID	The subscription ID	
ACC_ID	The account ID	A link to ACCOUNTS.ID
CONTRACT_ID	The contract ID	A link to CONTRACTS.ID

TARIFF_ID	The service (price plan) ID	A link to SERVICES.ID
EQUIP_ID	The customer equipment ID	A link to EQUIP.ID
D_BEGIN	The subscription begin date and time	The date and time when a customer subscribed to this price plan or service
D_END	The subscription end date and time	Leave empty if this is the latest chosen price plan
QUANT	The scheduled amount of service	For price plans - leave empty
PAY_DAY	The charging day	When the charging day is not fixed, leave empty

Note: services and the price plan are exported for the next period. If you have a fixed charging day bound to the 1st day of a month, then export as PAY_DAY = 1 (typically used by organizations).

The Payments

The **PAYMENTS** table

Field	Description	Comment
ID	The operation ID	
ACC_ID	The personal account ID	A link to ACCOUNTS.ID
BANK_ID	The bank ID	A link to BANKS.ID. The provider is to have an operating account at this bank.
D_OPER	The date and time of the operation (payment)	
PAYMENT_SUM	The amount of payment multiplied by 100 (an even number)	
PAYMENT_TYPE_ID	The payment type	A link to PAYMENT_TYPE.ID. When left empty, the default payment types are used

The Chargings

The **WRITEOFFS** table

Field	Description	Comment
ID	The operation ID	
ACC_ID	The account ID	A link to ACCOUNTS.ID
CONTRACT_ID	The contract ID	A link to CONTRACTS.ID
D_OPER	The date and time of the operation (charging)	It must lie within the charging period specified in D_BEGIN D_END
TARIFF_ID	The service (price plan) ID	A link to SERVICES.ID
EQUIP_ID	The CPE ID	A link to EQUIP.ID
SUM	The charged amount multiplied by 100	The total amount to be charged, not the service price.
D_BEGIN	The begin date and time of the charging period	
D_END	The end date and time of the charging period	
USED	The amount multiplied by 100	In measuring units specified for the service as per TARIFF_ID entered in Hydra

The amounts in the WRITEOFFS table should not be negative - only positive or 0. This table is used for exporting chargings over previous charging periods (executed charge logs) and details on current billing period of customers (charge logs in force).

Additional Tables

The Multiple Comments

Loading multiple comments to customers and CPE is supported.

The **COMMENT_TYPES** table

ID	The comment type ID
----	---------------------

NAME	The comment name
------	------------------

It is matched against the Comment Types Registry

The **USER_COMMENTS** table

ID	
USER_ID	A link to USERS.ID
COMMENT_TYPE_ID	A link to COMMENT_TYPES.ID
CL_COMMENT	The comment text
D_OPER	The date and time of creation
D_SIGNAL	The reminder date and time
D_EXEC	The execution date and time

The **EQUIP_COMMENTS** table

ID	The identifier
EQUIP_ID	A link to EQUIP.ID
COMMENT_TYPE_ID	A link to COMMENT_TYPES.ID
CL_COMMENT	The comment text
D_OPER	The date and time of creation
D_SIGNAL	The reminder date and time
D_EXEC	The execution date and time

Addresses

During the migration process some of the fields are decomposed, and the data from them is recorded into additional tables. Particularly, an address in **USERS.ADDR** undergoes parsing and is then recorded in the **PARSED_USER_ADDRESSES** table. Thus, if the billing that undergoes data exporting stores decomposed information on the address it is not necessary to write it in one row as you can fill in the table instead.

Parsed addresses for basic subjects

The **PARSED_USER_ADDRESSES** table

Field	Description	Comment
USER_ID	The corresponding ID from the USERS table	A link to USERS.ID
ADDR_BIND_TYPE_ID	The address type	A link to FACT_ADDR_BIND_TYPES.ID An optional field. By default, the actual address is used.
VC_ORIGINAL	The row with the address from USERS.ADDR. When filling in manually it is optional.	
VC_DISTRICT	District	Fixed type of region – with code REGION_TYPE_District
VC_CITY	The locality name	
VC_CITY_TYPE	The locality type	A short name of the region type:"c.", "t."...
VC_STREET	The street name	
VC_STREET_TYPE	The street type	A short name of the region type:"str.", "av.."...
VC_HOUSE	The street number	
VC_BUILDING	The pavillion number	
VC_CONSTRUCT	The structure number	
VC_OWNERSHIP	The property number	

VC_ENTRANCE_NO	The entrance number	
VC_FLOOR	The floor	Only numeric values allowed
VC_FLAT	The apartment	
VC_DIS_CODE	The intercom code	
VC_CUSTOM_ADDRESS	The custom address	
VC_REM	The comment	

Parsed CPE addresses

The **PARSED_EQUIP_ADDRESSES** table

Field	Description	Comment
EQUIP_ID	The corresponding ID from the EQUIP table	A link to EQUIP.ID
ADDR_BIND_TYPE_ID	The address type	A link to FACT_ADDR_BIND_TYPES.ID. An optional field. By default, the service address is used.
VC_ORIGINAL	The row with the address from EQUIP.ADDR. When filling in manually it is optional.	
VC_DISTRICT	District	Fixed type of region – with code REGION_TYPE_District
VC_CITY	The locality name	
VC_CITY_TYPE	The locality type	A short name of the region type:"c.", "t."...
VC_STREET	The street name	
VC_STREET_TYPE	The street type	A short name of the region type:"str.", "av.."...
VC_HOUSE	The street number	
VC_BUILDING	The pavillion number	
VC_CONSTRUCT	The structure number	
VC_OWNERSHIP	The property number	
VC_ENTRANCE_NO	The entrance number	
VC_FLOOR	The floor	Only numeric values allowed
VC_FLAT	The apartment	
VC_DIS_CODE	The intercom code	
VC_CUSTOM_ADDRESS	The custom address	
VC_REM	The comment	

Parsed phone numbers of basic subjects

The **USER_PHONES** table

USER_ID	The corresponding ID from the USERS table
PHONE_TYPE_ID	The corresponding ID of the phone number binding type to the subject from the PHONE_TYPES table
PHONE	The phone number
REM	The comment

Matching exported customers against those in Hydra

During the latter migration it may be useful to load the customer contents from the exported data into the contents of the already existing customer in Hydra. To do so you should fill in the **USER_MAPPINGS** table.

The **USER_MAPPINGS** table

USER_ID	The ID of the exported customer from the USERS table
USER_DST_CODE	The existing customer code from Hydra

Division employees

Oftentimes, the number of employees is quite big to be entered manually. You need to do it by adding employees as customers into the USERS table, then granting the permission to access applications with the help of **NETSERV** (similarly to granting them access to the Customer Self-Care Portal) and filling in the following tables.

The **DEPARTMENTS** table

Field	Description
ID	The department identifier
FIRM_ID	A link to the division from FIRMS.ID
NAME	The department name

The **EMPLOYEE_TYPES** table

Field	Description
ID	The identifier
NAME	The name

The **EMPLOYEES** table

Field	Description	Comment
ID	The identifier	
USER_ID	The customer	A link to USERS.ID
FIRM_ID	The employer division of the customer	A link to FIRMS.ID
DEPARTMENT_ID	The department (can be used in Hydra to distinguish permissions)	A link to DEPARTMENTS.ID
EMPLOYEE_TYPE_ID	The employee type (can be used in Hydra to distinguish permissions)	A link to EMPLOYEE_TYPES.ID
NAME_GENITIVE	The full name	
APPOINTMENT	The position	
APPOINTMENT_GENITIVE	The position	
ACT_AUTHORITY	Acting on the basis of authority	
TAB_NO	The employee code	
D_BEGIN	The date of hire	
D_FIRE	The date of leaving	
REM	The comment	