EPI-USE LABS
value through innovation

SCRAMBLING SAP IS-U DATA

A WHITE PAPER BY JAMES WATSON

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INTRODUCTION

Organisations running SAP's Industry solution for Utilities (IS-U) know it tends to be more complex than other SAP ERP solutions. The data model differs, and the dependencies in the data should be taken into account when scrambling it in non-Production environments.

EPI-USE Labs is an industry leader in SAP IS-U data management, providing solutions to copy and anonymise SAP data from Production to make it safely available in non-Production environments. We have worked with multiple clients, and gained a unique insight into the functional recommendations around handling data and specifically the anonymisation of data in non-Production systems.

In this white paper, we will share our insights and understanding of the specific challenges faced when anonymising SAP IS-U data, and provide our recommendations for the best quality test data while meeting the common security requirements.

UNDERSTANDING SAP IS-U MASTER DATA

Firstly, let's look at the Master data in the IS-U data model and the sensitive data stored against core objects of the business data items:

- **Business Partners (BP):** the core Partner record representing the end Customer. This can directly hold the Name, Telephone Number, Date of Birth, Date of Death, tax numbers and bank account details. In addition, our experience is that the BP is often customised to include markers of special needs for the Customer, i.e. hearing impaired or blind. There is also a specific link to all the address numbers associated to the Business Partner, i.e. the ADRC, ADR2, ADR6 tables.
- **Customer:** Replicated from the Business Partner and holding a mirror of the details, but also holding the Address directly in the record and another unique Address Number link to the Address tables.
- **Contract Account:** Assigned to the Business Partner for each combination of Address and Product/Meter configuration. In its history, one Business Partner can have multiple Contract Accounts. In some cases, the Name of the person will be linked to the Contract Account and stored directly.

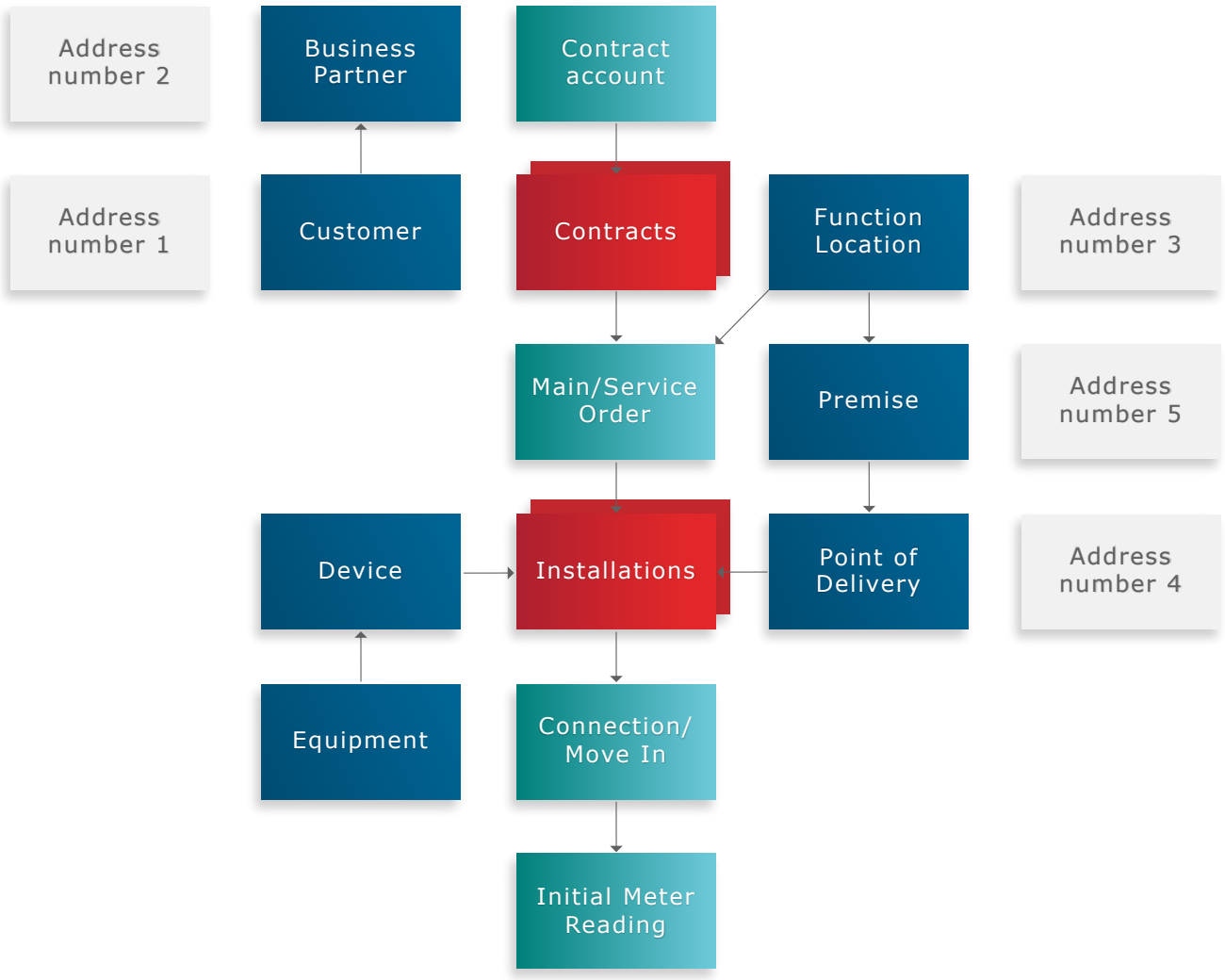
The Contract Account can have one or many Contracts associated. Although the Contract itself does not contain any sensitive information, it provides the link to the Technical Master Data through the Installation. Within the Technical Master Data structure, the association of the Meter (Device) and the Physical Installation Address (Premise and Connection Object) are linked, with all of these items containing an Address which is recognised throughout the industry as the location of the specific device.

Address is not traditionally considered to be an object in itself, but it is for an SAP IS-U instance. It is also specific to both the Meter, Installation and Person or Business Partner. The object is made up to contain the following information:

1. Name(s)
2. Telephone Number(s)
3. Street Address
4. Email Address and more

Address is linked to the various objects that make up a Utility account, using an Address Number as a key integration; however the same Address Number is not shared between the objects. The Address Number is linked to the Customer, Business Partner, Point of Delivery, Premise and Connection Object. These will all be different, however the Street Address details held in each record will be the same. This is due to the fact that the Meter and the Supply point is always going to be there, and multiple people (Business Partners) can live at that Address and be associated with it. To accommodate this complexity, a highly integrated data model is in place to allow permanent technical Master data to be temporarily attached to specific Business Master Data for the period of tenancy.

The diagram below demonstrates the core structure of one Customer, related to one Address for one fuel/device:



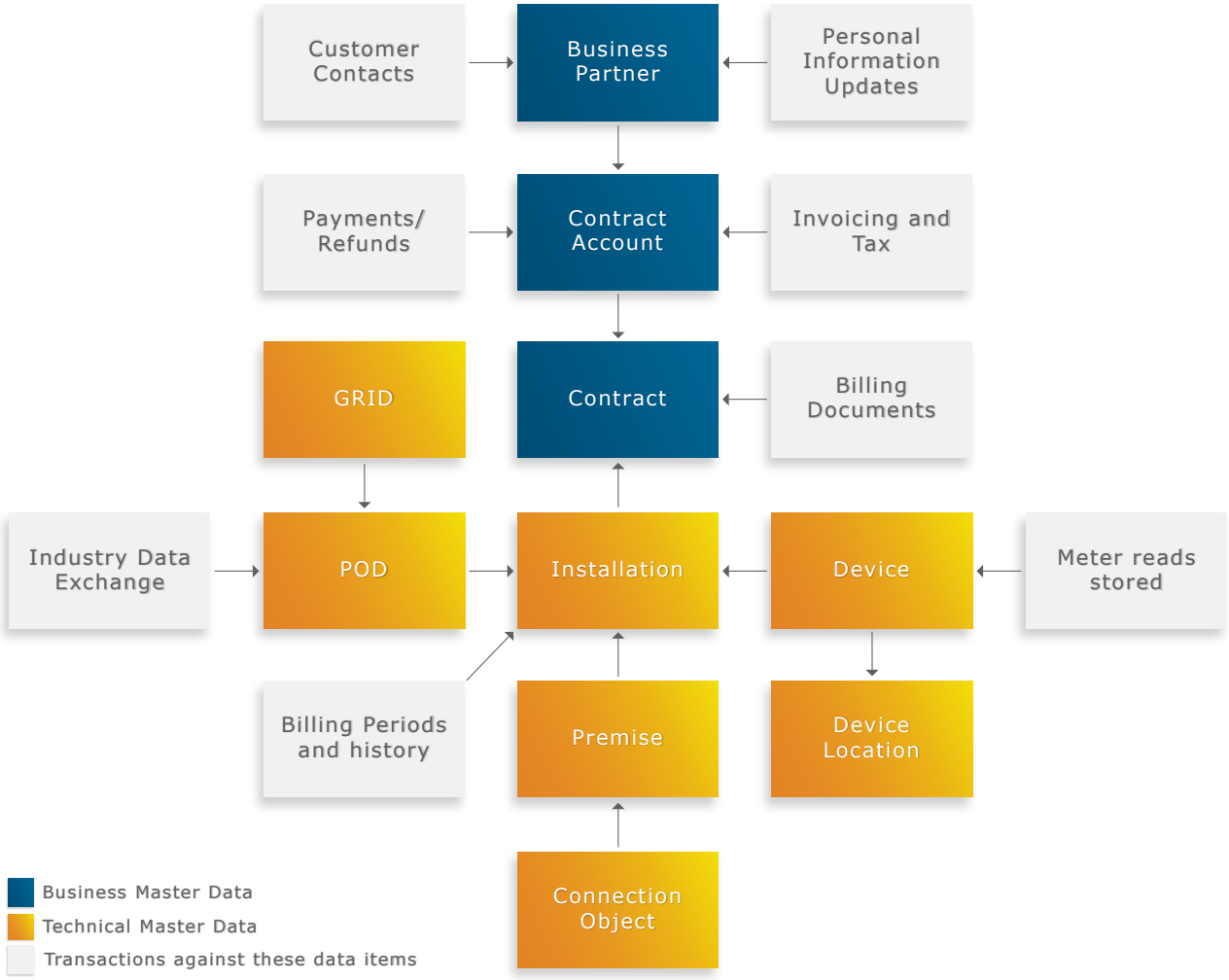
SAP IS-U DATA AND ADDRESS RECORDS

In addition, multiple Fuels/Properties and supply periods complicate this picture further. Often, a CRM for IS-U is also active and directly aligned with both the Business Partner data and installed base (IBASE) replicating Address and personal details from the ECC IS-U system.

Within the typical transactional postings of an SAP IS-U environment, you need to consider the processing of data but also the processing within the market.

UNDERSTANDING SAP IS-U TRANSACTIONAL DATA

Certain Transactional data is processed in and stored against specific parts of the Master Data Model. The diagram below represents some of these relationships.



SAP IS-U TRANSACTIONAL DATA

As can be seen, the consumption and Billing history is held within the Technical Master Data; however, the invoicing and payments for those Billing Documents are held in the Business Master Data Item Contract Account. As such, an intrinsic relationship of Business and Technical Master Data exists for all accounts within an ECC IS-U solution, and is needed in the non-Production system to reliably complete testing.

Add the CRM instance to control Contract status, Prospects, Installed Base, Complaints with a direct replication into the ECC IS-U solution, and you now have a data model designed to hold people's personal data.

MARKET CONSIDERATIONS

As well as understanding the data held within the SAP IS-U environment, it is important to consider the industry participants and your place in the market.

The EPI-USE Labs experience so far has demonstrated a number of similarities in the markets throughout the globe, with the common participants being:

- **The generator** – producing power or clarifying gas for use in the country's grid
- **The distributor** – transferring power and gas through the market from the generators to the consumer
- **The supplier** – responsible for measuring consumptions per fuel and household, transferring the cost of generation and distribution to the consumer
- **Engineers** – owning the physical meters on the wall in a consumer premise and with a mobile workforce able to visit and fix issues with meters which are not functioning as expected
- **Reader/data collectors** – responsible for a workforce who physically inspect and read the meters in a consumer premise, and pass these to the supplier for consumption calculation and Billing.

This can vary in different markets, and some cases one company will act as more than one participant. The most important consideration from a data management point of view is these participants or internal systems must be able to communicate with each other to fulfil the business scenarios, such as the examples below.

Scenario	Description of interdependency
A new property is built and power is needed.	The consumer in this case would normally contact the **distributor**, as they are responsible for providing power lines to the property. This would be charged directly to the Customer, and an initial supplier would be nominated. The distributor would provide a Point of Delivery to the supplier to reference the location power is now available to. The **supplier** will receive and create the Technical Master Data for this property based on the information provided by the distributor. However, there is still a need for a Meter; through discussion with the Customer, a type of Meter will be agreed and a Service Order to the **engineers** will be raised to install the required Meter. The engineers then provide the information for the fitted Meter (such as serial number, number of registers) which is transformed to the SAP Device, completing the Supplier's IS-U Installation object. The supplier can now move in a Contract and create a Contract Account to link that consumer (Business Partner) to the Installation. **Participants referencing the same property: supplier, distributor, engineers.**

A Meter inspection for a region is complete, and consumption read is to be provided.	The **reader/data collectors** will, according to their agreed schedule, inspect the Meter at the consumer's property and provide the details of this according to the assigned intercompany data exchange method. Typically this will reference either the industry Point of Delivery or Meter Serial Number for the Address along with the report and consumption values. The **supplier** will interpret this into the correct Installation and associate the updated details and consumption for the next Billing. **Participants referencing the same property: supplier, reader/collector.**
Consumer contacts the supplier with a supply issue, stating no gas is getting to the property.	Once the **supplier** is notified of an issue which needs addressing, they will contact the **engineers** and arrange an appointment. Through the IS-U Service Order functionality, the details of the Point of Delivery and the Meter Serial Number in question will be shared with a request to resolve the issue. The engineers will physically attend on site and resolve the issue found. In this example, let's assume they need to replace the Meter due to a defect. The Meter details at the property have now been updated in the property, and the engineers need to inform the **reader/data collectors** and the supplier of this change. The readers/data collectors and suppliers will receive this update along with the removal and Installation Meter readings to allow final consumption and start the new recording for the property. **Participants referencing the same property: supplier, engineer, reader/collector.**

These are just three example processes. You could also consider the change of a supplier at a property in a free market, or cosmetic work requiring the move of a Meter for in-premise changes, additional supply points etc. The important item to note is that multiple parties all work on the one single property to achieve the end-user consumption. Depending on your location within the market, these intercompany processes could make up 70-80% of your processes.

This generates a unique challenge: although companies must be compliant with data privacy regulations, they also need to be able to communicate between themselves and test processors sharing data.

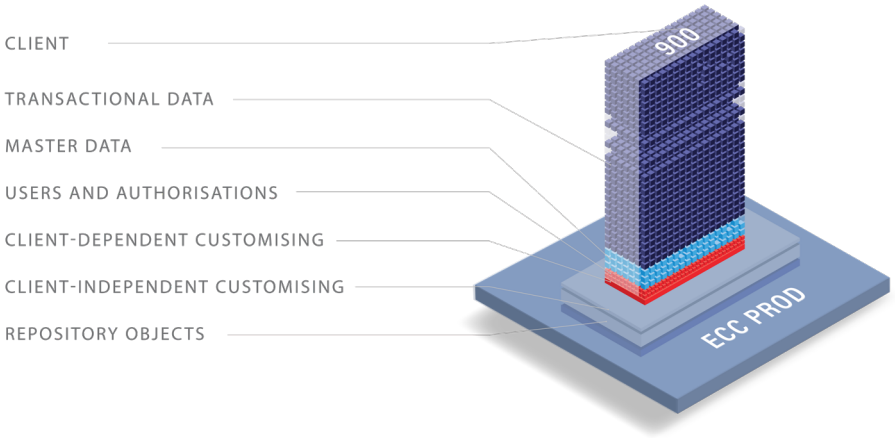
OUR SOLUTION: DATA SYNC MANAGER

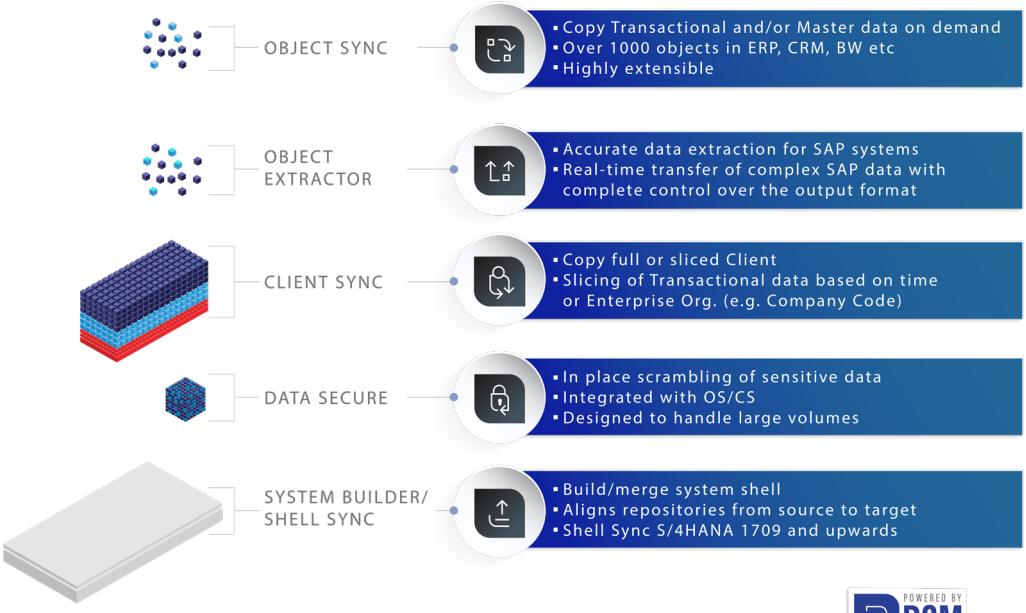
EPI-USE Labs offers a solution to copy and mask data in the SAP IS-U environment and any linked CRM systems. Here is a more detailed look into the solution.

Data Sync Manager™ (DSM) is an integrated solution with five complementary products:

- **System Builder™** (or Shell Sync for SAP S/4HANA) allows you to quickly and easily export the repository of a system without taking all the transactional data, so you can install a new non-Production system with a consistent repository. This requires fewer resources than full system copies.
- **Client Sync™** enables you to copy a subset of a client to your target system, you can select the Contract Accounts or Installations you wish to copy with data related to them.
- **Object Sync™** lets you select data at the business object level, such as a single/group of Business Partners, Installations or Connection Objects, and copy it to be able to add this to the non-Production environment. You can identify the linked CRM data and copy this concurrently, providing an interim data-on-demand solution to provide fresh test data without large refresh timelines.
- **Object Extractor™** allows real-time transfer of complex SAP data for S/4HANA Migration Cockpit loading, Test Automation sheet creation, AI Learning platforms, etc., with complete control over the output format.
- **Data Secure™** masks sensitive data in non-Production systems to comply with statutory requirements and industry standards. Data Secure will scramble sensitive data after it is copied, whether it was copied by DSM or via a standard SAP client copy. The core data for integration will not be changed but all personal information for any individual will be removed.

SAP DATA ARCHITECTURE

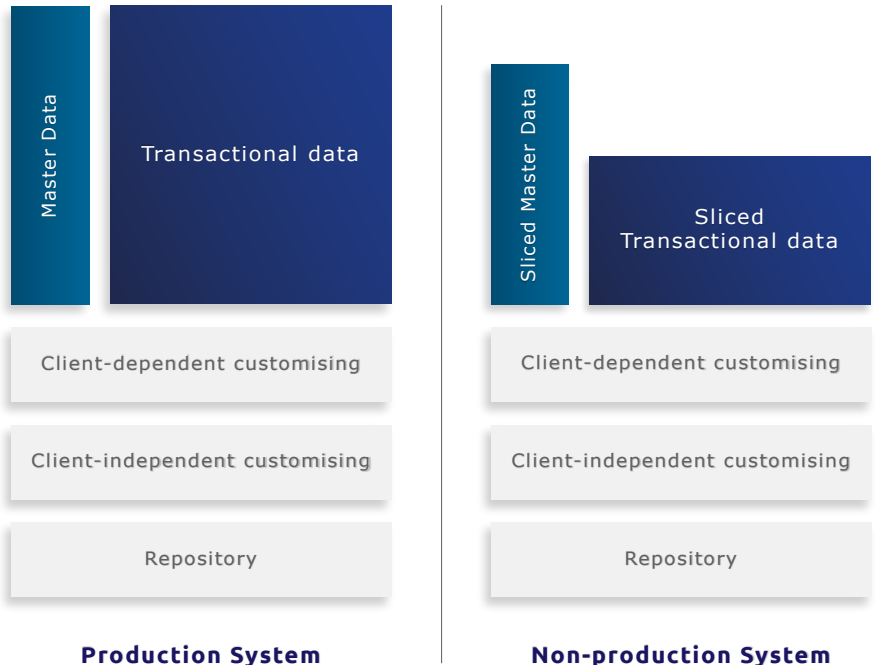




POWERED BY DSM

MINIMISE THE DATA FOOTPRINT

The first recommendation is to reduce the data footprint by taking a subset of the data. With **Client Sync**, you can select a subset of 10 to 50,000 records from the millions of consumer Business Partners to copy to your non-Production client. This provides a list of accounts to provide the best mix of data to test processes without the need to hold full data copies in non-Production.



This provides proportionate data for the use of testing processes or to provide services to the consumer. The data that is selected from Production will overwrite all data in the non-Production environment, leaving only the sliced data.

The benefits of minimising the data are that you save costs on storage, since the IS-U environment tends to be large and growing at a rapid pace, and doing full system copies tends to take a long time. It is also better when it comes to security risk, since it reduces your attack surface by having less data, and adheres to the GDPR (General Data Protection Regulation) principle of data minimisation. The systems are smaller and more manageable.

SCRAMBLE NON-PRODUCTION DATA

The second recommendation is to anonymise the data. **Data Secure** is a scrambling solution with support for Utilities systems and it will randomly change the following data directly in the Database:

- Name
- Telephone Number
- Email Address
- Bank Details
- Date of Birth
- Date of Death
- Diary notes
- Tax Numbers
- Personal ID numbers.

This data is aligned between the IS-U and CRM objects to retain the consistency of data between systems, but remove the Personally Identifiable Information of the consumer.

In the case of Utilities, EPI-USE Labs clearly recommends that the Address should NOT be scrambled

Within the Technical Master Data, the Address is recognised throughout the industry as associated to the Point of Delivery and Device. In addition, the Address is a core part of the Delivery of service for the Utility; without this real data it is not possible to complete the service for which the business is in place. To successfully test and deliver processes to ensure delivery of these essential services, the real data is required.

Because the IS-U and CRM Business Master data is then directly related to the Technical Master Data (as described above), this then prevents the Business Address data from being scrambled. Through this approach, our global Utility Customer base has removed the Personally Identifiable Information from the consumer's record, while allowing required processes to complete for internal and industry testing.

The scenarios below for scrambling Addresses have frequently been raised with us:

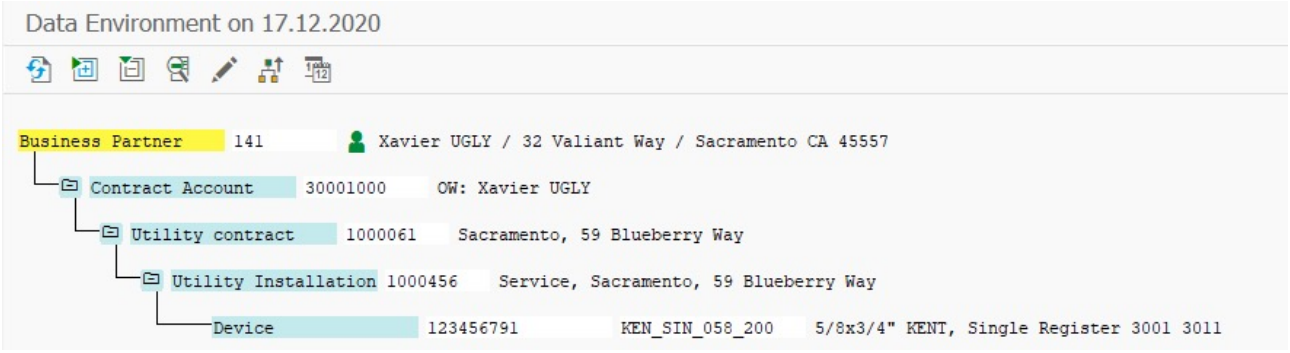
What if I only scramble the Business Address?

It is technically possible to do this, aligning the Address on the Business Partner in CRM and IS-U and the Customer object. However, because the Address is linked to the Technical Master data in the Premise, Connection Object, Point of Delivery or Device Location, which are all linked to the Business Partner, you can still identify the real Address.

The below screenshots show the transaction ECENV_BP before and after the Business Partner Address is scrambled; as can be seen, the Contract and Installation still clearly shows the original.

Before:

After:



Can you reassign a Business Partner and Contract Account to a different Installation?

The Device and Meter reads/consumption are linked to a specific Address and Billing consumption; that Billing consumption is invoiced in the Business Master Data Contract Account. Therefore, if you reassign the Business accounts to new Technical Master Data, the invoicing and Billing/Consumption will no longer align.

As such, the resulting data would not be able to Invoice further and calculate an accurate balance according to payments and consumption. Functionally, this approach would not leave useable data in the test environment.

Is it possible to shuffle real Addresses?

There are two issues with this. The first is rather simple: this will end all Industry and Intercompany testing.
As described above with the simple scenarios, the multiple participants in a Utilities market all hold the same referenced details in their own internal systems, which will directly link:

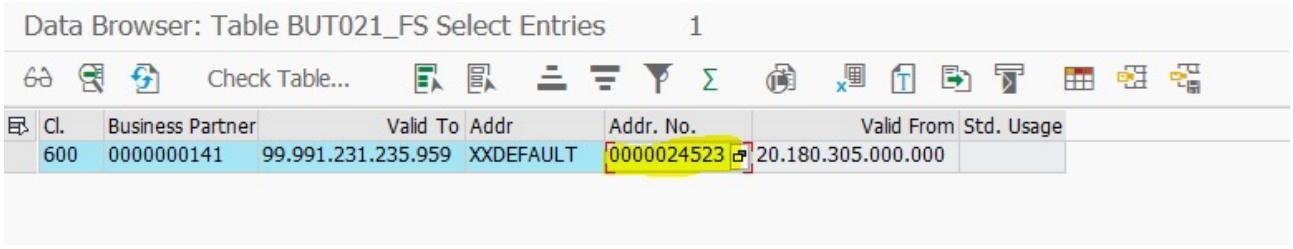
- The Address
- The Meter/Device with the recognised Meter Serial Number
- Any Industry-specific Point of Delivery ID.

If you only break this link in your system, assigning different Addresses to the same Meters and POD ID, then when communicating externally for industry process testing this will fail with incorrect details.

The second issue with this approach is the complexity in achieving a consistency in the data. The SAP data model provides multiple Address records for the same account, but all reference to the same physical address.

The examples below are taken from an internal EPI-USE Labs testing system; this is often found in a Customer's environment. Further customised Address management will be seen, and all screenshots are for the same record:

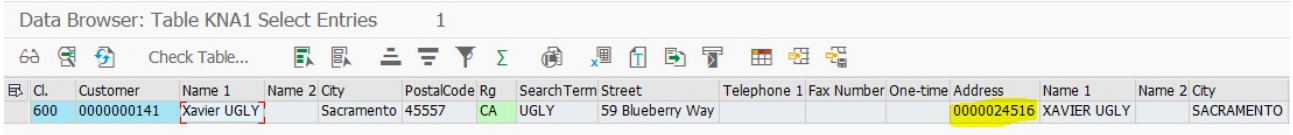
Business Partner Address:


Data Browser: Table BUT021_FS Select Entries 1

Check Table...

Cl.	Business Partner	Valid To	Addr	Addr. No.	Valid From	Std. Usage
600	0000000141	99.991.231.235.959	XXDEFAULT	0000024523	20.180.305.000.000	

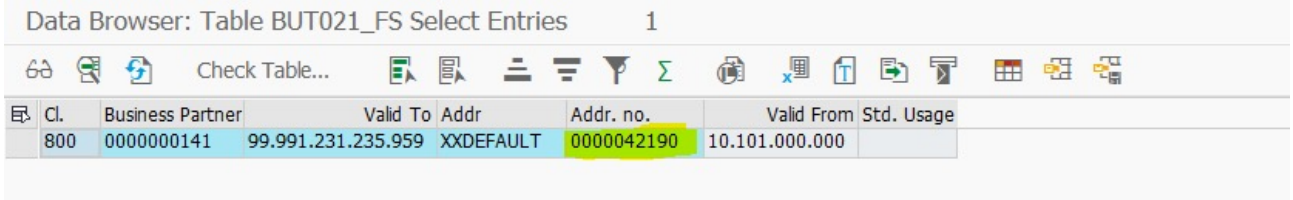
Customer Address, both a physical record and an Address Number link:


Data Browser: Table KNA1 Select Entries 1

Check Table...

Cl.	Customer	Name 1	Name 2	City	PostalCode	Rg	SearchTerm	Street	Telephone 1	Fax Number	One-time	Address	Name 1	Name 2	City
600	0000000141	Xavier UGLY		Sacramento	45557	CA	UGLY	59 Blueberry Way				0000024516	XAVIER UGLY		SACRAMENTO

CRM linked Business Partner with a different Address:


Data Browser: Table BUT021_FS Select Entries 1

Check Table...

Cl.	Business Partner	Valid To	Addr	Addr. no.	Valid From	Std. Usage
800	0000000141	99.991.231.235.959	XXDEFAULT	0000042190	10.101.000.000	

Then all the Technical Master Data holding a unique Address alignment also:

Data Browser: Table ADRV Select Entries 3

Check Table...

Cl.	Addr. No.	Seq. No.	Table	Field	Application table key	Key	Owner
600	0000023173	1	ILOA	ADRNR	6001000066	PM01	X
600	0000023173	1000000325	IFLOT	TPLNR	6001000092	PM01	
600	0000023173	1000000326	EQUI	EQUNR	600000000000010000066	PM01	

Referenced again into the functional location of the device and connection object:

Data Browser: Table IFLO Select Entries 1

Check Table...

Cl.	Functional Location	Language	Addr. No.
600	1000066	E	0000023173

So in this example, three Address keys are flagged, each with the same data in the central Address table.

Data Browser: Table ADRC Select Entries 3

Check Table...

Cl.	Addr. No.	From	Versi..	To	Key	City	Postl Code	Street	Ctr	Language	Rg	Key	Fla
600	0000023173	01.01.0001		31.12.9999	0001	Sacramento	45557	59 Blueberry Way	US	E	CA	PM01	
600	0000024516	01.01.0001		31.12.9999	0002	Sacramento	45557	59 Blueberry Way	US	E	CA	BP	
600	0000024523	01.01.0001		31.12.9999		Sacramento	45557	59 Blueberry Way	US	E	CA	BP	

You also have to consider that each Business Partner will have multiple Addresses; i.e., through history, one person who has lived at more than one property.

Finally, the IS-U Billing model relies on rate facts. One of these facts is the Region, influencing the price charged for consumption in many supplier businesses. Any new Address would need to consider this, to ensure that a valid Region is also associated; in an ideal scenario the same fuel types and meters should also be considered. It may not be possible to find a matching Address that meets all of these requirements within the supply base, after which an account would no longer reflect the copied Production data.

Due to this data model, and the fact that the original data is already not aligned, it is not possible to consistently replicate this model en-masse to ensure that a different Address Key is allocated to all related data and still points to the same physical address. There would also be a significant performance delay in any processing to try and achieve this, once all the possible variants were taken into account.

CONCLUSION

The data model of SAP IS-U is complex, to accommodate the business requirement of the industry. The need to have test data in non-Production is important to support the business. But having real data in non-Production can be a risk to the business. In this document, we looked at data minimisation and scrambling as two recommendations to improve your security.

When it comes to the data scrambling, once the person is removed from the property, the security requirement is met as the Personally Identifiable Information has been protected. Keeping the Address as original will allow all the intercompany process testing and internally aligned consumption, billing or invoicing processes to continue and provide accurate testing in non-Production.

Where your SAP IS-U solution has been customised to include, for example, Address management, the best option is to start with a data analysis. EPI-USE Labs offers a free assessment to look at what data you have in your system, and we can provide you with insights into your data and whether you require a custom solution or not.

DSM is certified by SAP for 'Integration with RISE with SAP S/4HANA Cloud'.

SAP Certified
Integration with RISE with SAP S/4HANA Cloud

As a global software solutions and managed services company, EPI-USE Labs helps you to maximise the performance, management and security of your SAP® and SAP SuccessFactors® systems. Our clients tell us every day how we have transformed their business operations. Contact us to find out how we can help you solve your business challenges.

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