IYKRA
Data Fellowship Program

Implementing Data Versioning & Testing in dbt

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Data versioning with dbt

Dimensional modeling

- Dimensional modeling is a **data modeling technique** where you break data up into **“facts”** and **“dimensions”** to organize and describe entities within your data warehouse
- The purpose of dimensional modeling is to **optimize the database for faster retrieval of data**

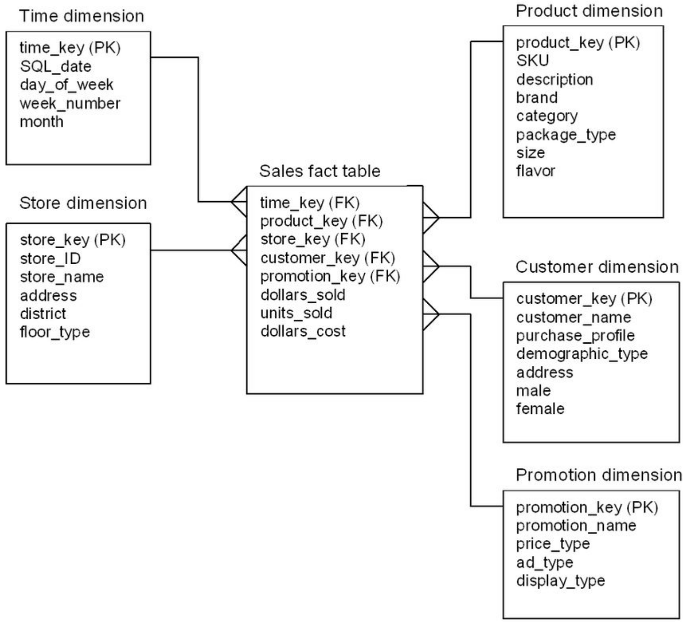
Dimensional model vs Relational model

- A dimensional model is **designed to read, summarize, analyze numeric information** like values, balances, counts, weights, etc. in a data warehouse. In contrast, relational model is **optimized for addition, updating and deletion of data** in an OLTP system.
- In the relational model, **normalization and ER models reduce redundancy in data**. On the contrary, dimensional model arranges data in such a way that it is easier to retrieve information and generate reports, ***denormalized and redundant***.

Facts & Dimensions

- **Facts**
  The **measurements/metrics** or facts of the business process
- **Dimensions**
  The **context** surrounding a business process event. It give who, what, where of a fact.

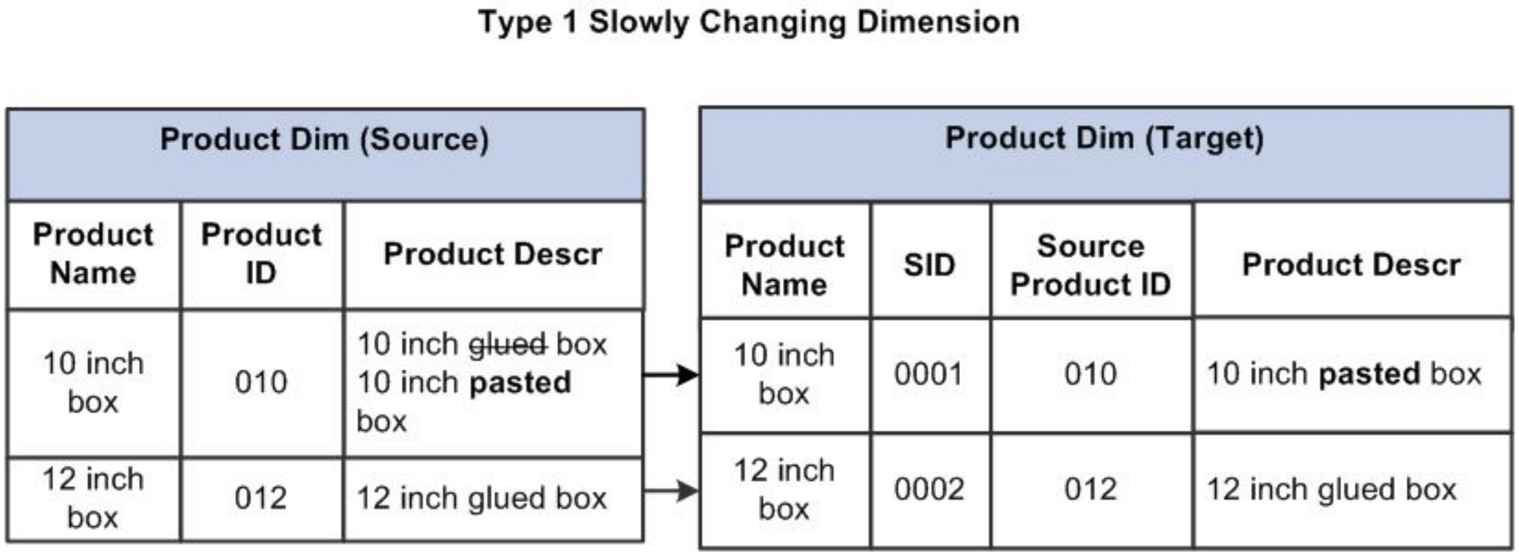
Fact & Dimension Tables



Slowly Changing Dimension (SCD)

- SCD is a dimension that **stores and manages both current and historical data over time** in a data warehouse
- The three types of SCDs,
    - Type 1 SCDs - *Overwriting*
    - Type 2 SCDs - *Creating another dimension record*
    - Type 3 SCDs - *Creating a current value field*

Type 1 SCD



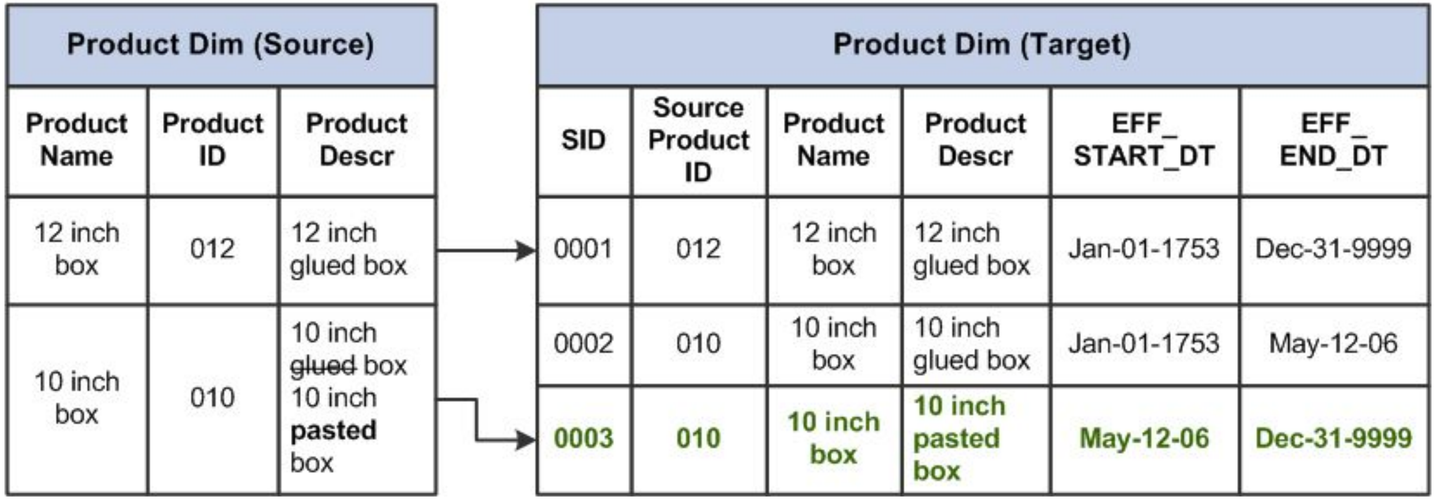
Type 1 Slowly Changing Dimension

Product Dim (Source)		
Product Name	**Product ID**	**Product Descr**
10 inch box	010	10 inch ~~glued~~ box 10 inch **pasted** box
12 inch box	012	12 inch glued box

Product Dim (Target)			
Product Name	**SID**	**Source Product ID**	**Product Descr**
10 inch box	0001	010	10 inch **pasted** box
12 inch box	0002	012	12 inch glued box

Type 2 SCD

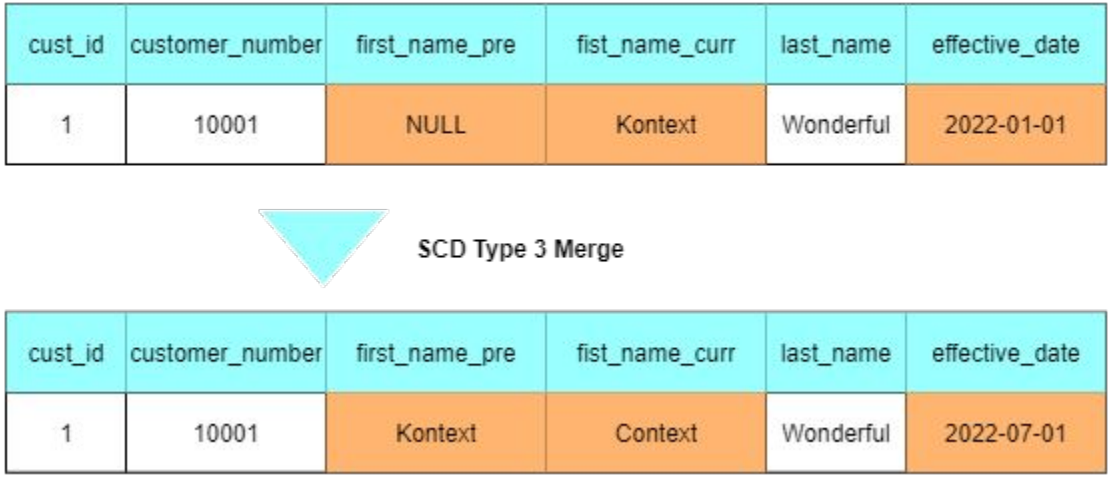
Type 2 Slowly Changing Dimension



Product Dim (Source)		
Product Name	Product ID	Product Descr
12 inch box	012	12 inch glued box
10 inch box	010	10 inch ~~glued~~ box 10 inch **pasted** box

Product Dim (Target)					
SID	Source Product ID	Product Name	Product Descr	EFF_ START_DT	EFF_ END_DT
0001	012	12 inch box	12 inch glued box	Jan-01-1753	Dec-31-9999
0002	010	10 inch box	10 inch glued box	Jan-01-1753	May-12-06
0003	**010**	**10 inch box**	**10 inch pasted box**	**May-12-06**	**Dec-31-9999**

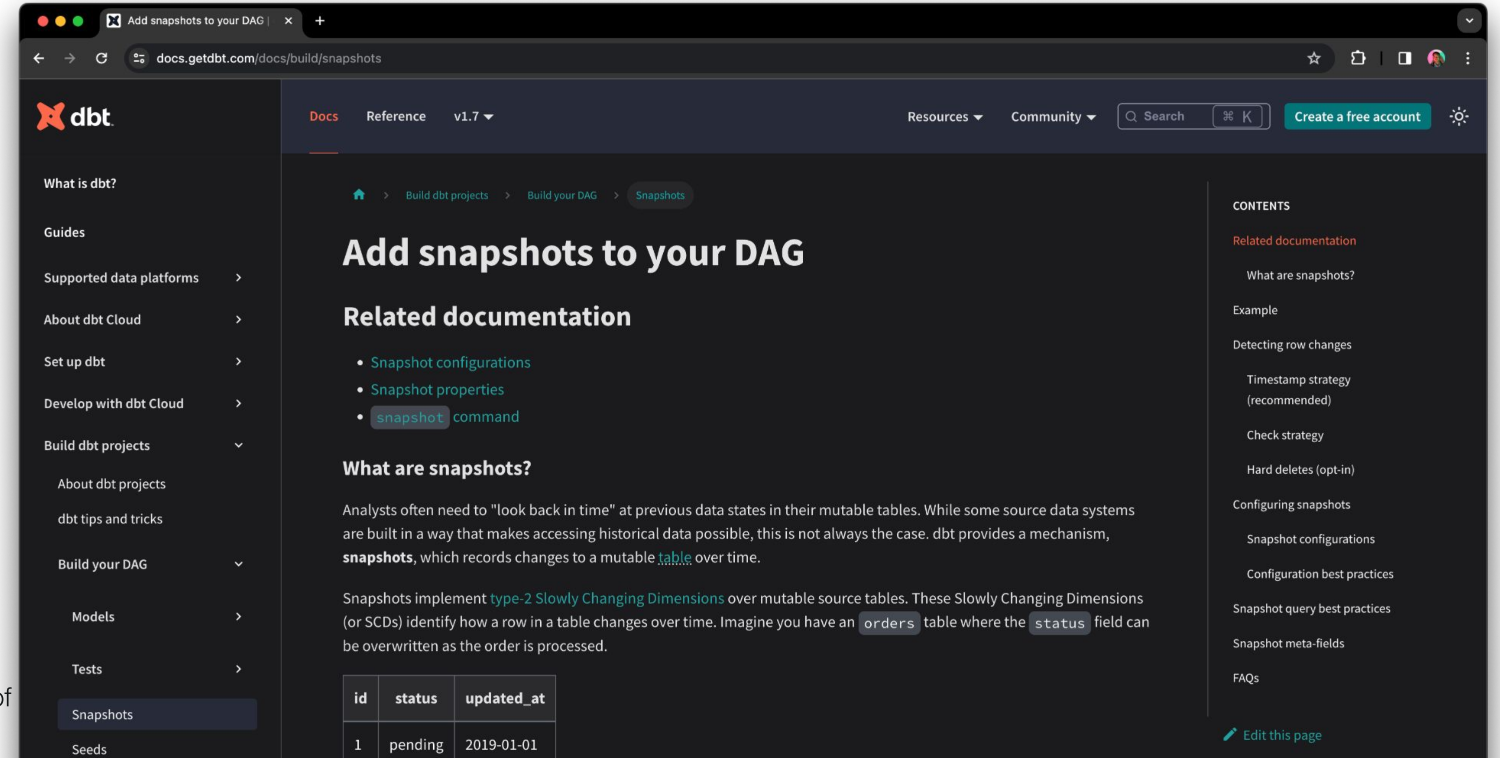
Type 3 SCD



cust_id	customer_number	first_name_pre	fist_name_curr	last_name	effective_date
1	10001	NULL	Kontext	Wonderful	2022-01-01

cust_id	customer_number	first_name_pre	fist_name_curr	last_name	effective_date
1	10001	Kontext	Context	Wonderful	2022-07-01

dbt supports SCD ..



Add snapshots to your DAG

Related documentation

- Snapshot configurations
- Snapshot properties
- `snapshot` command

What are snapshots?

Analysts often need to "look back in time" at previous data states in their mutable tables. While some source data systems are built in a way that makes accessing historical data possible, this is not always the case. dbt provides a mechanism, **snapshots**, which records changes to a mutable table over time.

Snapshots implement type-2 Slowly Changing Dimensions over mutable source tables. These Slowly Changing Dimensions (or SCDs) identify how a row in a table changes over time. Imagine you have an `orders` table where the `status` field can be overwritten as the order is processed.

id	status	updated_at
1	pending	2019-01-01

dbt snapshot

Demo Session

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Data testing with dbt

Data testing with dbt

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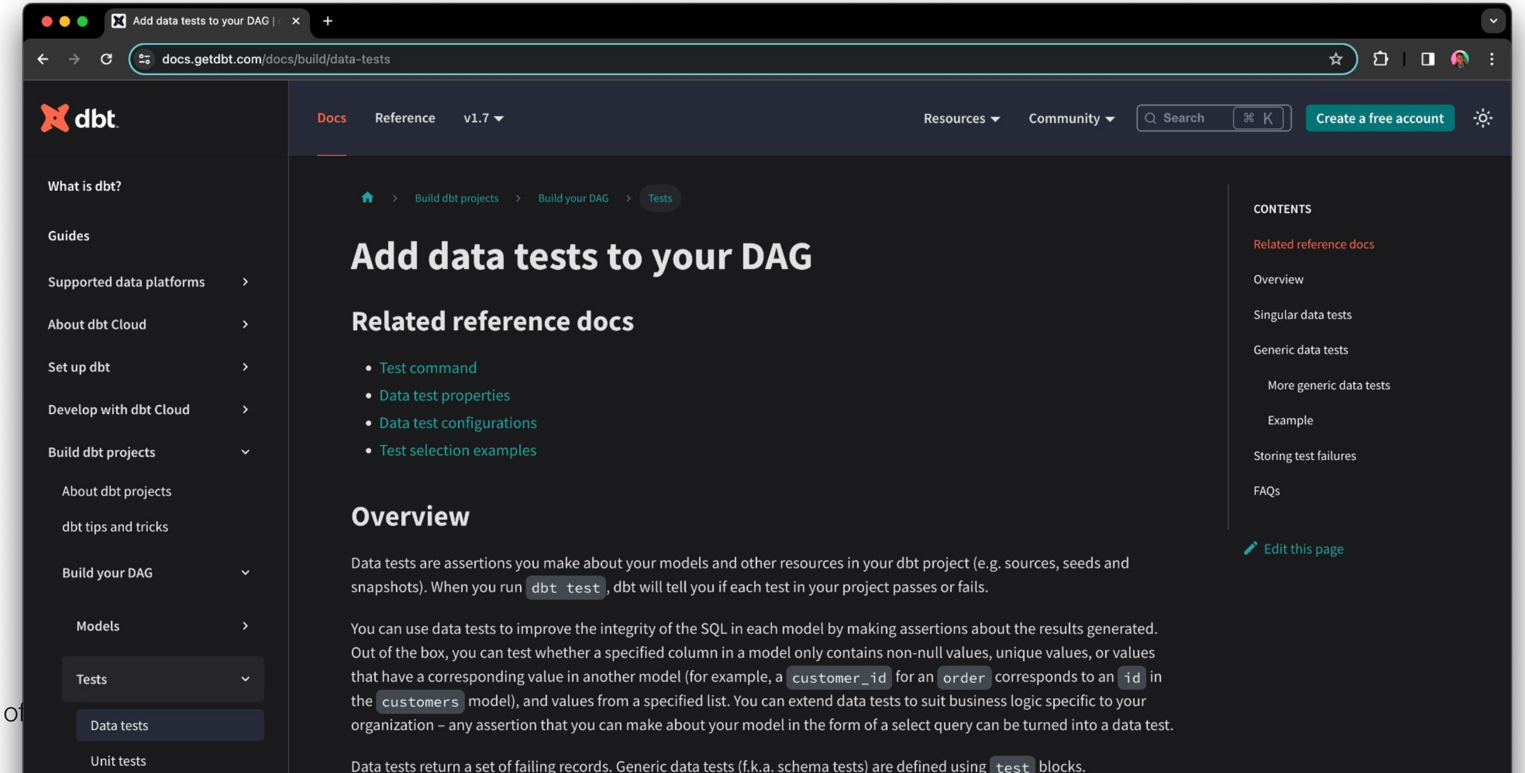


Add data tests to your DAG

Related reference docs

- Test command
- Data test properties
- Data test configurations
- Test selection examples

Overview

Data tests are assertions you make about your models and other resources in your dbt project (e.g. sources, seeds and snapshots). When you run `dbt test`, dbt will tell you if each test in your project passes or fails.

You can use data tests to improve the integrity of the SQL in each model by making assertions about the results generated. Out of the box, you can test whether a specified column in a model only contains non-null values, unique values, or values that have a corresponding value in another model (for example, a `customer_id` for an `order` corresponds to an `id` in the `customers` model), and values from a specified list. You can extend data tests to suit business logic specific to your organization – any assertion that you can make about your model in the form of a select query can be turned into a data test.

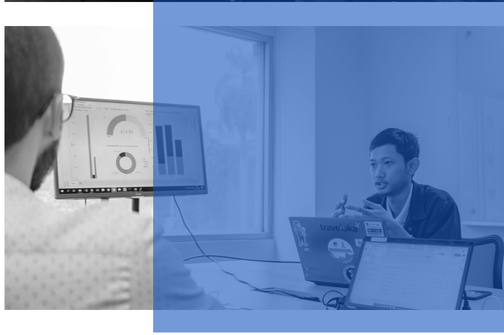
Data tests return a set of failing records. Generic data tests (f.k.a. schema tests) are defined using `test` blocks.

dbt test

Demo Session

References

- https://docs.getdbt.com/docs/introduction



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Thank you!