ServiceNow Application Developer

## Server-side Scripting > Controlling When Business Rules Run

The *When* option determines when, relative to database access, Business Rule logic executes:

- *before*

- *after*

- *async*

- *display*

> **IMPORTANT**: Business Rules do NOT monitor forms. The forms shown in the graphics on this page represent a user interacting with the database by loading and saving records in a form.

Before

Before Business Rules execute their logic before a database operation occurs. Use before Business Rules when field values on a record need to be modified before the database access occurs. Before Business Rules run before the database operation so no extra operations are required. For example, concatenate two fields values and write the concatenated values to the *Description* field.
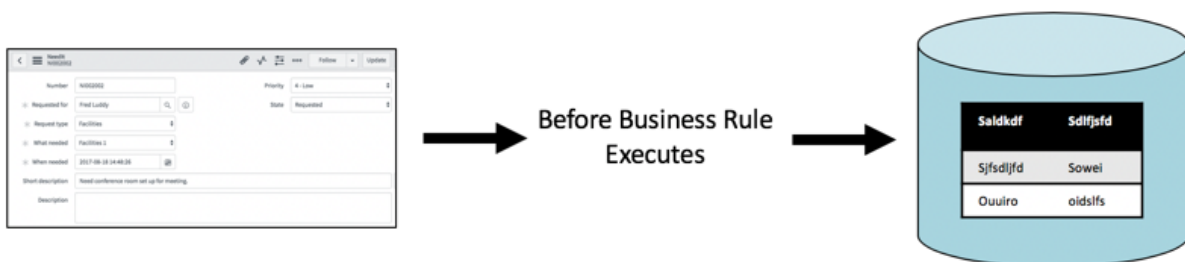
After

After Business Rules execute their logic **immediately** after a database operation occurs and before the resulting form is rendered for the user. Use after Business Rules when no changes are needed to the record being accessed in the database. For example, use an after Business Rule when updates need to be made to a record related to the record accessed. If a record has child records use an after Business Rules to propagate a change from the parent record to the children.
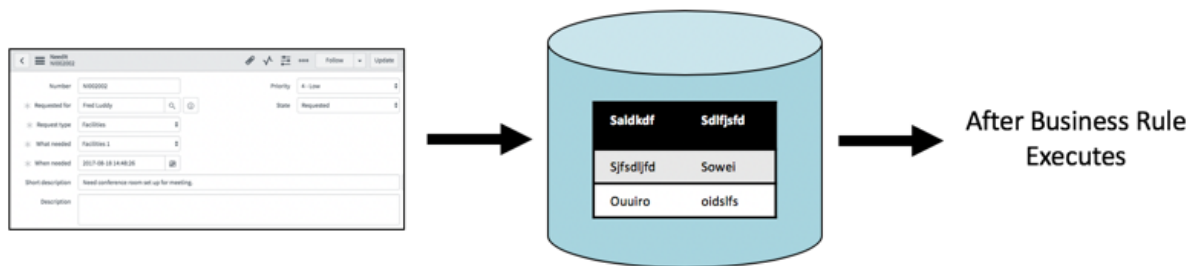
Async

Like after Business Rules, async Business Rules execute their logic after a database operation occurs. Unlike after Business Rules, async Business Rules execute asynchronously. Async Business Rules execute on a different processing thread than before or after Business Rules. They are queued by a scheduler to be run as soon as possible. This allows the current transaction to complete without waiting for the Business Rules execution to finish and prevents freezing a user's screen. Use Async Business Rules when the logic can be executed in near real-time as opposed to real-time (after Business Rules). For example use async Business Rules to invoke web services through the REST API. Service level agreement (SLA) calculations are also typically done as async Business Rules.
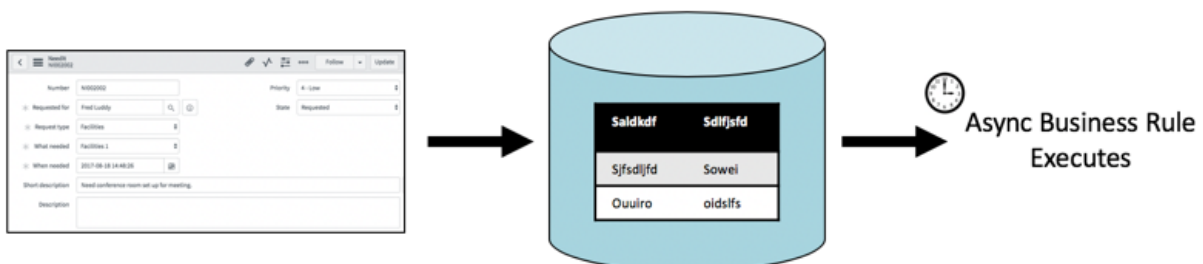
To see async Business Rules queued up for execution, use the Application Navigator in the main ServiceNow window (not Studio) to open **System Scheduler > Scheduled Jobs > Scheduled Jobs**. Look for Scheduled Job names starting with ASYNC. They go in and out of the queue very quickly and can be hard to catch on the schedule.

> **DEVELOPER TIP**: Use async Business Rules instead of after Business Rules whenever possible to benefit from executing on the scheduler thread.

Display

Display Business Rules execute their logic when a form loads and a record is loaded from the database. They must complete execution before control of the form is given to a user. The purpose of a display Business Rule is to populate an automatically instantiated object, *g_scratchpad*. The *g_scratchpad* object is passed from the display Business Rule to the client-side for use by client-side scripts. Recall that when scripting on the client-side, scripts only have access to fields and field values for fields on the form and *not* all of the fields from the database. Use the *g_scratchpad* object to pass data to the client-side without modifying the form. The *g_scratchpad* object has no default properties.

Business Rule Process Flow

A table can have multiple Business Rules of different *When* types. The order in which the Business Rules execute is:

User or System Query → Query Rules → Database Query

→ Display Rules → Form Submit

→ Before Rules → Database Update → After/Async Rules