

CMS Certified Developer 12 LTS

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AJAX handling in the TYPO3 Backend

Basic knowledge about how AJAX actions are handled in the TYPO3 Backend and how custom code can be added to be called via AJAX.

Goals:

- I can register routes for backend AJAX calls.
- I know how to process incoming AJAX requests in PHP.
- I can execute AJAX requests in JavaScript.

Links:

- TYPO3 Explained: Client Side AJAX in TYPO3 Backend:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Backend/AjaxClientSide.html>
- TYPO3 Explained: Ajax in TYPO3 Backend:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Backend/Ajax.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- General Extension Architecture

Tags:

- TYPO3
- JavaScript
- Backend

Accessing FlexForm Data

Using data provided in FlexForms in plugin CEs and custom records.

Goals:

- I know how FlexForm data is stored in the database.
- I can extract data from a FlexForm field.
- I can modify the contents of a FlexForm field.

Links:

- FlexForms in the Configuration HowTo: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ExtensionArchitecture/HowTo/Configuration.html#flexforms>
- TYPO3 Explained:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/FlexForms/Index.html>
- Core v8.4 ChangeLog: Access FlexForm values via TS: <https://docs.typo3.org/c/typo3/cms-core/11.5/en-us/Changelog/8.4/Feature-17309-AccessFlexformValueViaTS.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Internal
- Flexform

Admin Panel usage as a developer

This skill handles the usage of the TYPO3 Admin Panel as an Extension Developer.

Goals:

- I can use the Admin Panel to check dispatched events.
- I can use the Admin Panel to check executed SQL Queries.
- I can use the Admin Panel to check the debug log.
- I can use the Admin Panel to check the request Info.

Links:

- TYPO3 Admin Panel: Debugging a page: <https://docs.typo3.org/c/typo3/cms-adminpanel/12.4/en-us/Inspecting/Debug/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

AssetCollector class and ViewHelpers

The AssetCollector class, its methods and the corresponding ViewHelpers.

Goals:

- I can add CSS and JavaScript files to my controllers and views.
- I know when and how to use the API, and when and how to use the f:asset.* ViewHelpers.

Links:

- TYPO3 Explained:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Assets/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Backend Notifications

The focus of this skill is to know how to utilize notifications for backend users.

Goals:

- I know how to create notification messages in the TYPO3 backend.

Links:

- TYPO3 Explained:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/FlashMessages/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- Backend

Builder design pattern

Understanding the “Builder” Design Pattern.

Goals:

- I know the Builder Pattern and what it entails.
- I know how to retrieve or create new instances of a builder.
- I know how to re-use and not re-use builder instances.

Links:

- Wikipedia: Builder Pattern: https://en.wikipedia.org/wiki/Builder_pattern

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Architecture for Extensions

Tags:

Building Custom Dashboard Widgets

This skill covers creating custom widgets for the TYPO3 Backend Dashboard and configuring existing widget groups.

Goals:

- I know which abstract classes and interfaces the core provides, to build my own custom widgets.
- I know how to register new widgets and how to assign them to one or several widget groups.
- I can also create new widget groups.
- I know how to create new DataProvider in order to compose new widgets based on existing widget implementations

Links:

- Register new Widget:: <https://docs.typo3.org/c/typo3/cms-dashboard/12.4/en-us/Configuration/WidgetRegistration.html>
- Developer Documentation of EXT:dashboard:: <https://docs.typo3.org/c/typo3/cms-dashboard/12.4/en-us/Developer/Index.html>
- Configuring Widget Groups:: <https://docs.typo3.org/c/typo3/cms-dashboard/12.4/en-us/Configuration/WidgetGroupCreation.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- Backend

Building data processors

This skill covers the creation of data processors for TYPO3.

Goals:

- I know how to implement a data processor.
- I know how to alias a data processor.
- I know how to support `stdWrap` for data processor properties.
- I know how to execute data processors, e.g. for nesting.

Links:

- TYPO3 Explained: Custom data processors: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/ContentElements/CustomDataProcessing.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Templating and Other Outputs

Tags:

Coding Standards in TYPO3

Knowing how to write code conforming to the coding standards used by the TYPO3 project.

Goals:

- I am familiar with the PSR standard and the usage in TYPO3.
- I know the TYPO3 namespace conventions.
- I know the official TYPO3 coding guidelines for PHP, JavaScript, etc.

Links:

- Coding Guidelines:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/CodingGuidelines/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Quality

Tags:

- TYPO3
- Structure
- PSR

Commands

This skill covers the creation of command-line commands for TYPO3, based on the Symfony Console component.

Goals:

- I know how to execute existing Symfony CLI commands.
- I can create and register new Symfony CLI commands
- I can find my way around existing commands and can modify them.

Links:

- Symfony Command Component: <https://symfony.com/doc/current/console.html>
- Symfony Command within TYPO3: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/CommandControllers/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Composer

Composer basics and its usage for PHP projects.

Goals:

I know

- what Composer is
- the purpose and the structure of file composer.json
- what composer.lock is and which purpose it serves
- the difference between the install and the update command

I can

- create a new Composer project
- specify requirements for my project
- install packages using Composer
- update packages
- remove packages

Links:

- Composer Website: <https://getcomposer.org/>

Maintainer:

HTL Rennweg (Ferdinand Kasper)

Domain Tag:

- Package management

Tags:

- PHP

Composer for TYPO3 Extensions

This skill introduces usage of Composer for extensions and their integration into TYPO3 projects.

Goals:

- I know which fields to use in the composer.json of my extension, what they mean and how they work, so that I can create working, readable and helpful composer.json files.
- I can use 3rd-party extensions and my own extensions in my site project via Composer.
- I also know the benefits and drawbacks of using Composer and can advise my coworkers and clients when to use which approach.
- In addition, I can build composer.json and ext_emconf.php files in such a way that their data is synchronized correctly.
- I know how to provide and access public assets in a composer installation.
- Also, I know how to update the autoloader data for non-Composer installations.

Links:

- Composer Documentation: The composer.json Schema:: <https://getcomposer.org/doc/04-schema.md>
- TYPO3 Explained: composer.json:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/FileStructure/ComposerJson.html>
- TYPO3 Explained: ext_emconf.php: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/FileStructure/ExtEmconf.html>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- General Extension Architecture

Tags:

- TYPO3
- Extensions

Content Security Policy in Extensions

This skill covers the usage and configuration of CSP in TYPO3 Extension.

Goals:

- I know how to configure CSP via PHP
- I know how to integrate assets in a CSP conform way
- I know to make use of 3rd Party assets in a CSP conform way

Links:

- TYPO3 Explained: Content Security Policy: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/ContentSecurityPolicy/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Security

Tags:

Contexts & Aspects

This skill introduces usage of the request context and aspects that can be used to enrich this context, e.g. with localization information.

Goals:

- I know the difference between the ApplicationContext and the Context API.
- I can use the Context API, know which Aspects exist, and can access information from Aspects.
- I know how to add my own Aspects to the Context.

Links:

- TYPO3 Explained Application Context:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/RequestLifeCycle/Bootstrapping.html#application-context>
- TYPO3 Explained Context API and Aspects:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Context/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Controller

This skill covers controllers, the "C" in the MVC pattern.

Goals:

I know which role controllers play in the pattern.

Links:

- Wikipedia: MVC: <https://en.wikipedia.org/wiki/Model%E2%80%93view%E2%80%93controller>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Extbase
- MVC

Creating Backend modules

This skill covers the creation of custom backend modules for TYPO3.

Goals:

- I know how to register a backend module with controller actions.
- I know how to register a backend module with routes.
- I know which APIs to use to get a similar look and feel as the Core's backend modules.
- I know how to route to a backend module.
- I know how to retrieve current request info within a module.
- I know how to access backend module configuration.

Links:

- TYPO3 Explained: Backend Modules HowTo: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/HowTo/BackendModule/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Creating Scheduler Tasks and Commands

How to build Scheduler tasks and commands for automating recurring tasks.

Goals:

- I know how to create a new Scheduler task.
- I know how to create a new command.
- I know about the context Scheduler tasks are executed in.
- I know about the context commands are executed in.
- I know that commands can be executed as scheduler tasks.
- I know the differences between scheduler tasks and commands.

Links:

- EXT:scheduler documentation: Creating a new task:: <https://docs.typo3.org/c/typo3/cms-scheduler/12.4/en-us/DevelopersGuide/Index.html>
- TYPO3 Explained commands:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/CommandControllers/Index.html>
- TYPO3 Explained command tutorial:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/CommandControllers/Tutorial.html#console-command-tutorial>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- General Extension Architecture

Tags:

- TYPO3
- Backend

Custom Route Enhancers

This skill covers the creation of custom Route Enhancers for the TYPO3 frontend routing.

Goals:

- I know the difference between a Route Enhancer, a Decorator and a Mapper.
- I know how to implement a custom Route Enhancer.
- I can use my custom Route Enhancer for to route requests to my extension

Links:

- TYPO3 Explained: Advanced Routing Configuration: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Routing/AdvancedRoutingConfiguration.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Site Management and URL Routing
- Frontend

Customizing Extbase Repositories

How to implement custom persistence functionality in Extbase.

Goals:

- I know how to apply customized query settings to all repository queries.
- I know how to manipulate query settings for a specific method.
- I know the difference between Extbase and Doctrine queries.
- I can create custom queries using the Extbase mechanisms.

Links:

- TYPO3 Explained Custom queries with Doctrine QueryBuilder:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Database/QueryBuilder/Index.html>
- TYPO3 Explained Individual Database Queries:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Extbase/Reference/Domain/Repository.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Extbase
- Persistence
- Repository

Data structures in TYPO3 core

Classes for data structures, e.g., the BitSet and Enumeration class, and their usage.

Goals:

- I can decide in which cases to use the BitSet class, can explain the drawbacks and know how to use it properly.
- I understand how bit sets work in general.
- I know the use cases of the Enumeration class and the patterns to use for it.
- I know the use case of the TypeInterface and how to use it.

Links:

- TYPO3 Explained:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Enumerations/Index.html>
- documentation on the BitSet class: <https://docs.typo3.org/c/typo3/cms-core/master/en-us/Changelog/10.0/Feature-87665-IntroduceBitSetClass.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

DataHandler (TCE= TYPO3 Core Engine)

This skill handles basic knowledge of the DataHandler, a TYPO3 Core component for processing user data. It also covers how it can be leveraged in custom developed extensions.

Goals:

- I know how the DataHandler processes data entered in forms in the Backend.
- I know about hooks I can use for modifying data during processing.
- I know how to use DataHandler in my own extensions (e.g. for mass-creation of records).
- I can modify data during the processing of certain tasks (e.g. versioning).

Links:

- TYPO3 Explained DataHandler:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Typo3CoreEngine/Index.html>
- TYPO3 Explained: Using the DataHandler in scripts: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ApiOverview/Typo3CoreEngine/UsingDataHandler/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Database Management System (DBMS)

Knowledge about DBMS.

Goals:

- I know what a DBMS is and what it is used for.
- I can name some examples.
- I know what the term “relational” in the context of DBMS means.

Links:

- Wikipedia: Relational Database: [Wikipedia: Relational Database: https://en.wikipedia.org/wiki/Relational_database](https://en.wikipedia.org/wiki/Relational_database)
- Wikipedia: Database Management System: <https://en.wikipedia.org/wiki/Database>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Database Handling
- DBMS
- SQL

Database Record Translations

This skill covers the translation configuration of database records via TCA.

Goals:

- I can make records translatable.
- I know how to configure translation behavior of TCA columns.
- I am familiar with the different translation modes in relation fields (IRRE).

Links:

- TCA Reference: columns:: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/Columns/Index.html>
- TCA Reference: type=inline:: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Inline/Index.html>
- TCA Reference: Ctrl section:: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/Ctrl/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- Persistence

Database Schema Definition

This skill handles definition of own database tables and fields for an extension for automatic management by the TYPO3 Core.

Goals:

- I can write an ext_tables.sql file both for creating new and extending existing tables.
- I know which fields are generated automatically based on the TCA.

Links:

- TYPO3 Explained: Database Structure:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Database/DatabaseStructure/Index.html>
- TYPO3 Explained: ext_tables.sql: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ExtensionArchitecture/FileStructure/ExtTablesSql.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- General Extension Architecture

Tags:

- TYPO3
- Database Handling
- Extensions
- Persistence

Debugging PSR-14 Event Handling

This skill covers debugging the registration, dispatching and handling of events.

Goals:

- I know how to retrieve a list of registered event listeners.
- I can use the admin panel to retrieve an overview of dispatched events.

Links:

- TYPO3 Explained: Debugging event handling: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ApiOverview/Events/EventDispatcher/Index.html#debugging-event-handling>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Debugging in PHP

Basic knowledge about error tracing methods in PHP.

Goals:

- I know about simple methods to print values to output (var_dump, print_r, echo, die).
- I know how to set up and use a debugging tool like Xdebug.

Links:

- Xdebug website:: <https://xdebug.org/>
- PHP Debugging Tutorial:: <https://code.tutsplus.com/tutorials/xdebug-professional-php-debugging--net-34396>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- PHP
- Debugging

Dependency Injection

Knowledge about dependency injection in general.

Goals:

- I understand the concept of dependency injection, its benefits and limitations.
- I know when dependency injection should be used.

Links:

- Wikipedia article: https://en.wikipedia.org/wiki/Dependency_injection

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Architecture for Extensions

Tags:

Docblocks in PHP

The syntax and general purpose of documentation blocks, and the most often used annotations.

Goals:

- I know how PHPDoc blocks look and I know the general purpose and limitations.
- I can write valid annotations.

Links:

- PHPDoc on Wikipedia: <https://en.wikipedia.org/wiki/PHPDoc>
- phpDocumentor manual: Basic Syntax: <https://docs.phpdoc.org/3.0/guide/references/phpdoc/basic-syntax.html>
- phpDocumentor manual: what is a DocBlock?: <https://docs.phpdoc.org/3.0/guide/getting-started/what-is-a-docblock.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Quality

Tags:

- PHP

Doctrine DBAL

Basic knowledge about the Doctrine component for transparently accessing several DBMS in PHP.

Goals:

- I know what Doctrine DBAL is.
- I know the difference between Doctrine DBAL and Doctrine ORM.
- I know the role of Doctrine DBAL in TYPO3.

Links:

- TYPO3 Explained: Doctrine DBAL:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Database/Introduction/Index.html>
- Doctrine DBAL:: <https://www.doctrine-project.org/index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Database Handling
- DBMS
- SQL
- Doctrine

Domain-Driven Design (DDD)

Understanding the concept of DDD.

Goals:

- I know the concept, its purposes and main points.
- I know where to find information to learn more.

Links:

- Basic Principles:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/BestPractises/SoftwareDesignPrinciples.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Architecture for Extensions

Tags:

- TYPO3
- Structure
- DDD
- Programming Paradigm

EXTBASEPLUGIN TypoScript Object

This skill covers the integration of Extbase plugins into rendering via TypoScript.

Goals:

- I can call an Extbase plugin via an EXTBASEPLUGIN TypoScript cObject.
- I know how caching works with EXTBASEPLUGIN.

Links:

- TypoScript Reference: EXTBASEPLUGIN: <https://docs.typo3.org/m/typo3/reference-typo3/12.4/en-us/ContentObjects/Extbaseplugin/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

Environment class

This skill covers knowledge on TYPO3's Environment class, which provides system-specific details that are independent from the system environment.

Goals:

- I know which kind of information the Environment class in the TYPO3 Core provides.
- I can write code that is not dependent on a specific type of operating system (Windows, Linux, etc.)

Links:

- TYPO3 Explained: Environment API:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Environment/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Error Actions

How to handle validation errors.

Goals:

- I know about the built-in error action, how it works and when it is used.
- I know how to provide a custom error action by overriding the default.

Links:

- TYPO3 Explained: Extbase Error Action: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ExtensionArchitecture/Extbase/Reference/Controller/ErrorAction.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Extbase
- Validation

Error handling/Exception handling

This skill provides knowledge on TYPO3-specific ways of handling errors during program execution and finding information about any errors that occurred.

Goals:

- I can configure the error and exception handling for development and production.
- I know when errors are handled by the error handler, and where to find any logged errors.

Links:

- TYPO3 Core API: Error and Exception Handling:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/ErrorAndExceptionHandler/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Extbase Annotations

This skill is about PHPDoc annotations particular to Extbase.

Goals:

- I can use the correct Extbase annotations in my models and controllers.
- I know which annotation I should use when several possible options are available.

Links:

- Available Annotations and basic usage:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Extbase/Reference/Annotations.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- Extbase

Extbase Fluid View

The Fluid-based HTML view of Extbase.

Goals:

- I know how the Fluid view relates to Fluid.
- I can use layouts and partials in my templates.
- I can configure the view to include templates from multiple directories, with correct priority.

Links:

- Configuring multiple Fluid paths: <https://docs.typo3.org/m/typo3/book-extbasefluid/master/en-us/b-ExtbaseReference/Index.html#view>
- TYPO3 Explained: Fluid Partials: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ApiOverview/Fluid/Introduction.html#partials>
- TYPO3 Explained: Fluid Layouts: <https://docs.typo3.org/m/typo3/reference-coreapi/main/en-us/ApiOverview/Fluid/Introduction.html#layouts>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Templating and Other Outputs

Tags:

- TYPO3
- Extbase
- Fluid
- View

Extbase JSON View

The built-in JSON View in Extbase.

Goals:

- I know how the JSON view differs from a normal HTML-based view.
- I know how the JSON view works when the data structure parts are selected for rendering.
- I can configure the JSON output for simple and complex (nested) data structures.

Links:

- TYPO3 Explained: JSON Response: <https://docs.typo3.org/m/typo3/reference-coreapi/main/en-us/ExtensionArchitecture/Extbase/Reference/View/Index.html#json-response>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Templating and Other Outputs

Tags:

- TYPO3
- Extbase
- JSON

Extbase Persistence

How Extbase interacts with the permanent storage.

Goals:

- I know how Extbase works when it stores and retrieves persistent data.
- I know the lifecycle of an object.

Links:

- The interaction between Extbase and the database: <https://docs.typo3.org/m/typo3/book-extbasefluid/master/en-us/3-BlogExample/6-An-excursion-to-the-database.html>
- TYPO3 Explained: Hydrating objects: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Extbase/Reference/Domain/Model.html#hydrating-objects>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Extbase
- Persistence

Extbase PersistenceManager

The built-in PersistenceManager.

Goals:

- I am familiar with the PersistenceManager class.
- I know when to use the class to manually trigger I/O operations.
- I know at what point the PersistenceManager is triggered to automatically persist data.

Links:

- Difference between forward and redirect with non persisted objects:
<https://docs.typo3.org/m/typo3/book-extbasefluid/master/en-us/7-Controllers/1-Creating-Controllers-and-Actions.html>
- Automatic persistence of the domain logic: <https://docs.typo3.org/m/typo3/book-extbasefluid/master/en-us/3-BlogExample/10-Returning-the-result-to-TYPO3.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Extbase
- Persistence

Extbase Request/Response

How requests are handled by Extbase.

Goals:

- I know how an Extbase request relates to the TYPO3 page rendering process.
- I know how Extbase namespaces its arguments.
- I know the difference between forwards and redirects.
- I can extract arguments from the request data.
- I can add custom data to a response in my controller actions.

Links:

- TYPO3 Explained: Extbase Responses: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ExtensionArchitecture/Extbase/Reference/View/Index.html#responses>
- Request/Response in Extbase: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ExtensionArchitecture/Extbase/Reference/Controller/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Extbase

Extbase View

Explaining the view part of MVC in Extbase.

Goals:

- I know how data is passed to the view.
- I know how a view is configured in a controller.
- I know how different types of views can be used.
- I can pass variables to my template.

Links:

- Styling the output with Fluid: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ApiOverview/Fluid/Introduction.html>
- TYPO3 Explained: Extbase View: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ExtensionArchitecture/Extbase/Reference/View/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Extbase
- MVC
- View

Extending Base Models

This skill covers the use cases and different ways to extend the built-in models of Extbase.

Goals:

- I know which models are shipped with Extbase by default.
- I know when to use which default model as a base for own models.
- I know how to map database fields to properties using PHP configuration (fieldName).

Links:

- TYPO3 Explained: Connecting the model to the database:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Extbase/Reference/Domain/Model.html#connecting-the-model-to-the-database>
- TYPO3 Explained: Extbase Persistence:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Extbase/Reference/Domain/Persistence.html>
- Models shipped with Extbase:: <https://github.com/TYPO3/typo3/tree/12.4/typo3/sysex/extbase/Classes/Domain/Model>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Extbase
- MVC
- Model

Extending Existing Functionality

Extending core and extension functionality without changing code.

Goals:

- I know what hooks are and the two different types of hook implementations.
- I know about PSR-14 events and how they are implemented in TYPO3.
- I know what userFuncs in the TCA are and how to take advantage of them.
- I can identify places where TYPO3 allows to extend built-in functionality.

Links:

- TYPO3 Explained: List of PSR-14 Events:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Events/Events/Index.html>
- TYPO3 Explained: Event Dispatcher: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Events/EventDispatcher/Index.html>
- TYPO3 Explained: Hooks:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Events/Hooks/Index.html>
- Hooks and signal/slot in the official core documentation: <https://docs.typo3.org/typo3cms/CoreApiReference/latest/ApiOverview/Hooks/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Internal
- Hooks
- Signal/Slot
- UserFunc

Extending site configurations

This skill covers custom extensions to the TYPO3 Core Site configuration module.

Goals:

- I can add custom fields to the site configuration module.
- I know how to read values that are stored in custom site configuration fields.

Links:

- TYPO3 Explained: PHP API: Accessing Site Configuration:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/SiteHandling/AccessingSiteConfiguration.html>
- TYPO3 Explained: Extending Site Configuration:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/SiteHandling/ExtendingSiteConfig.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- Site Configuration

Extending the Admin Panel

This skill covers implementing custom functionality for the Admin Panel.

Goals:

- I know how to display information in the Admin Panel panel bar.
- I know how to create a module for the Admin Panel.
- I know how to include custom CSS and JavaScript files for custom modules.
- I know how to add a custom setting to the Admin Panel and how to retrieve its value to influence my code's behaviour.

Links:

- TYPO3 Admin Panel: Extending the Admin Panel: <https://docs.typo3.org/c/typo3/cms-adminpanel/12.4/en-us/Extending/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Extension File and Folder Structure

Knowing the file structure of an extension and where to place files by convention and due to technical requirements.

Goals:

- I know how the directory structure of a TYPO3 extension looks like and the additional Extbase conventions.
- I know the purposes of files in TYPO3 extensions (such as ext_emconf.php, ext_tables.php, and others).
- I can create an extension that is installable via the TYPO3 Extension Manager and/or Composer.

Links:

- TYPO3 Explained: ext_emconf.php: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ExtensionArchitecture/FileStructure/ExtEmconf.html>
- TYPO3 Explained: File structure:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/FileStructure/Index.html>
- TYPO3 Explained: Coding Guidelines:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/CodingGuidelines/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- General Extension Architecture

Tags:

- TYPO3
- Structure
- Extbase

Extension scanner

This skill covers the Extension Scanner, which extension authors and project maintainers can use to detect possible problems in their extensions while upgrading them to a newer TYPO3 version.

Goals:

- I can use the extension scanner from within the TYPO3 BE and from the command line. I know what kind of problems the scanner finds, and the limitations of the scanner.
- I can interpret findings of the scanner and judge whether they are relevant for my project.

Links:

- Extension Scanner on command line:: <https://github.com/Tuurlijk/typo3scan>
- Extension Scanner in TYPO3 Backend:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/HowTo/UpdateExtensions/ExtensionScanner.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- Upgrades

Extension: Lowlevel

The lowlevel extension allows examining the current TYPO3 configuration.

Goals:

- I know which information the backend module of EXT:lowlevel provides.
- I can examine my configuration changes with the help of the EXT:lowlevel backend module.
- I know how to debug execution order of middlewares and event handlers with EXT:lowlevel.
- I know how to utilize the tools that EXT:lowlevel provides for managing my development instance.

Links:

- Manual of EXT:lowlevel:: <https://docs.typo3.org/c/typo3/cms-lowlevel/12.4/en-us/>
- Verifying the TCA:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/HowTo/ExtendingTca/Verifying/Index.html>
- The Configuration module:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/Configuration/ConfigurationModule/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Backend

File abstraction layer (FAL)

Know about transparent inclusion of external file sources into TYPO3.

Goals:

- I know there is an abstraction layer between actual file storages and their handling in TYPO3.

Links:

- TYPO3 Explained: File abstraction layer (FAL): <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Fal/Index.html>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Files
- File
- File List Module
- File Tree
- Metadata
- Internal

Flash Messages

This skill covers flash messages, a mechanism used to communicate e.g. results of an action to the user.

Goals:

- I know where the Core flash messages and notifications can be used (and where not). I know which type of flash message to use for what purpose.
- I can create and output flash messages using PHP, HTML and JavaScript. I can output flash messages created in existing code, e.g. other extensions.

Links:

- TYPO3 Core API: Flash Messages:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/FlashMessages/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Flexform Concepts

Basics about the concept of Flexforms and how it relates to the TCA.

Goals:

- I know what a Flexform data structure is and how it compares to a similar TCA data structure.
- I know how data for a Flexform field is stored.
- I can create a Flexform data structure in XML.
- I can configure a Flexform field to use my XML data structure.

Links:

- TYPO3 Core API: FlexForms:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/FlexForms/Index.html>
- Flexform TCA Column reference:: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Flex/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TCA
- TYPO3
- Structure
- Flexform

Flexform Configuration Data Structure

How to create and configure a data structure for my plugin's configuration.

Goals:

- I know how configuration is managed by the “plugin” content type.
- I can provide a custom configuration data structure for my plugin.

Links:

- TYPO3 Core API: Data structure:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/DataFormats/T3datastructure/Index.html#t3datastructure>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- Configuration
- TYPO3
- Internal
- Flexform

Git basics

Basics and most important commands for working with the version-control system Git.

Goals:

I know

- what a VCS is
- what a branch is
- what a tag is
- what a repository is
- what a merge is

I can

- initialize a Git repository
- execute commands "commit", "push" and "pull"
- create a branch and work on it
- assign a tag to a certain development state
- merge code

Links:

- Git website: <https://git-scm.com/>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Server Management

Tags:

- Package management

Handling User Input

Knowledge about possible ways to retrieve and process user input.

Goals:

- I know how to access the arguments and values of a URL.
- I know how to access data passed into the system from forms.
- I know how to retrieve data from third-party systems.
- I know the typical security risks when user input is accessed/processed.

Links:

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Security

Tags:

- TYPO3
- Security

Implementing Custom Validators

How to provide custom data validation in Extbase.

Goals:

- I know which classes I can use as a base for my validator.
- I know where to put a custom validator class by convention and how to register the class.
- I know in which location a custom validator class should be stored by convention and how to register the class.
- I know how to use the validator in a controller action.

Links:

- TYPO3 Core API: Validator: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Extbase/Reference/Domain/Validator.html>
- TYPO3 Core API: Validation: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Extbase/Reference/Validation.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Extbase
- Validation

Implementing MVC in TYPO3

Introducing the concept of MVC in Extbase: base classes for models, controllers, repositories; the concept of services and utilities and when to use them.

Goals:

- I know which kinds of models exist in Extbase.
- I know how a repository for a model is implemented.
- I know how plugins relate to controllers and actions.
- I know how TYPO3/Extbase determines a template for a controller action.
- I can create a new plugin with one or multiple controllers.
- I can define templates for my controller actions.
- I can create a model and the related repository.

Links:

- TYPO3 Core API: View:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Extbase/Reference/View/Index.html>
- TYPO3 Core API: Controllers in Extbase:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Extbase/Reference/Controller/Index.html>
- TYPO3 Core API: Models in Extbase:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Extbase/Reference/Domain/Model.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- Architecture
- TYPO3
- Extbase
- Caching

Implementing ViewHelpers

Provides the foundations for using custom PHP code in a Fluid-based view.

Goals:

- I know which base classes for ViewHelpers exist.
- I know which functionality should be placed in a ViewHelper and what is better suited for a controller, service or utility.
- I can create my own ViewHelpers and use them in a template.
- I can register custom ViewHelper arguments.
- I can implement a custom conditional ViewHelper.

Links:

- TYPO3 Core API: Developing a custom ViewHelper:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Fluid/DevelopCustomViewhelper.html>
- Inline Syntax ViewHelper Converter: <http://www.fluid-converter.com/>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Extbase
- Fluid
- ViewHelper

Implementing upgrade wizards

This skill covers the implementation of upgrade wizards, which can be used by integrators to update existing extension data and configuration after upgrading the extension.

Goals:

- I can implement an update wizard and know when to use it.

Links:

- TYPO3 Core API: class.ext_update.php: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ExtensionArchitecture/HowTo/UpdateExtensions/UpdateWizards/ExtUpdateFile.html#update-wizards-extupdatefile>
- TYPO3 Explained: Creating upgrade wizards: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/HowTo/UpdateExtensions/UpdateWizards/Creation.html?highlight=upgrade%20wizard>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- General Extension Architecture

Tags:

- TYPO3

Importing ViewHelpers

Using third party ViewHelpers in your Fluid templates.

Goals:

- I can include third party ViewHelpers in my Fluid templates.
- I know that a TYPO3 Developer can build custom ViewHelpers

Links:

- Fluid: importing ViewHelpers: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Fluid/Syntax.html#import-viewhelper-namespaces>
- TYPO3 CMS: Developing a custom ViewHelper: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Fluid/DevelopCustomViewhelper.html>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- Templating with Fluid
- ViewHelper

JSON

The JSON format and its usages in web development.

Goals:

- I know how to decode JSON with PHP functions.
- I know how to create a valid JSON string with PHP functions.

Links:

- JSON format specification:: <https://json.org/>
- PHP json_encode function:: <https://www.php.net/manual/function.json-encode.php>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Templating and Other Outputs

Tags:

- TYPO3
- Data interchange formats
- Extbase
- JSON

JavaScript Event API in the Backend

This skill covers the JavaScript API for Events in the TYPO3 Backend, relevant for programming custom backend modules and extending existing modules.

Goals:

- I know about the Event API in JavaScript
- I can register my own event listeners
- I know about the different event strategies and their performance implications
- I know about the different event classes and when to use which of them

Links:

- TYPO3 Core ChangeLog on the event API: <https://docs.typo3.org/c/typo3/cms-core/main/en-us/Changelog/10.3/Feature-90471-JavaScriptEventAPI.html>
- TYPO3 Core API: JavaScript Event API:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Events/JavaScript/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- Backend
- JavaScript
- Events

JavaScript handling in the Backend

This skill covers the TYPO3-specific parts of RequireJS: how this library is used in TYPO3 and how developers can leverage the TYPO3 Core API to use their own JavaScript code in the TYPO3 Backend.

Goals:

- I know how to write JS code that is compatible with the TYPO3 backend.
- I know how to load my JS code via the PageRenderer.
- I know how to register custom JS namespaces in my extension.
- I can include and use third-party JS modules in my extension's JS code.
- I know how to migrate legacy RequireJS modules to the ES6-based.

Links:

- TYPO3 Core API: JavaScript in the TYPO3 Backend:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Backend/JavaScript/Index.html>
- TYPO3 Core API: ES6 in the TYPO3 Backend:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Backend/JavaScript/ES6/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- General Extension Architecture

Tags:

- TYPO3
- Backend
- JavaScript

Knowledge about Environment Error Logs

Ability to locate logs provided by system components.

Goals:

- I know where the error logs of TYPO3, a web server and PHP are located.
- I can access these logs in order to trace errors occurring in my environment.
- I know how to interpret error log messages in order to resolve the error.

Links:

- TYPO3 Explained: Configuration of the Logging System:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Logging/Configuration/Index.html>
- Apache Documentation: Error Log:: <https://httpd.apache.org/docs/2.4/logs.html#errorlog>
- Nginx Documentation: Configuring Logging:: <https://docs.nginx.com/nginx/admin-guide/monitoring/logging/>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Debugging
- Logging

Logging API

Knowledge about the logging API provided by TYPO3.

Goals:

- I know how to compose a proper log message and of which parts it consists.
- I know about the different log levels and their meaning.
- I know how to get and use a logger in my code.
- I know about log channels and how to use them in my code.

Links:

- TYPO3 Explained: Logging Framework Quickstart:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Logging/Quickstart/Index.html>
- TYPO3 Explained: Logging Framework/Logger:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Logging/Logger/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Debugging
- Logging

Mail API

This skill covers the TYPO3 Mail API, which internally uses Symfony's Mailer and Mime component for creating and sending emails.

Goals:

- I can configure the Mail API for different contexts.
- I can create new emails in my extensions and send them through the Mail API.
- I know how to create Fluid-based emails.
- I am familiar with the pros and cons of the different transport methods.

Links:

- Symfony Documentation: The Mailer Component::
<https://symfony.com/doc/current/components/mailer.html>
- TYPO3 Explained: Mail API and Configuration within TYPO3::
<https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Mail/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Making Extensions localizable

How to make extensions translatable and localizable.

Goals:

- I know conventions for language file names and file paths in TYPO3.
- I know the basics of the translation concept of TYPO3.
- I can translate labels in Fluid (f:translate ViewHelper).
- I can provide translatable TCA and Flexform labels.

Links:

- ViewHelper reference: f:translate:: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3/fluid/latest/Translate.html>
- Core Support for localization:: <https://docs.typo3.org/m/typo3/guide-frontendlocalization/12.4/en-us/CoreSupport/Tca/Index.html#core-support-tca>
- Documentation on XLIFF files:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Localization/XliffApi.html?highlight=xliff>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- General Extension Architecture

Tags:

- TYPO3
- Localization
- XLIFF

MetaTag API

This skill covers the MetaTag API, which can be used to manipulate the meta tags in the <head> section of the generated HTML page.

Goals:

- I can use the MetaTag API to add, modify or remove meta tags.
- I can implement and register my own MetaTagManagers.

Links:

- TYPO3 Explained: MetaTag API:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Seo/MetaTagApi.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Model

This skill covers the model in the MVC context.

Goals:

- I know which role models play in the software architectural pattern MVC.

Links:

- Wikipedia: MVC: <https://en.wikipedia.org/wiki/Model%E2%80%93view%E2%80%93controller>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Architecture for Extensions

Tags:

- TYPO3
- Extbase
- Model
- MVC

Notification Actions

Notifications as flashmessages in backend can have actions assigned to interact with the editor.

Goals:

- I know the different types of actions for notifications.
- I know how to define javascript actions in notification messages.

Links:

- TYPO3 Changelog: Introduce Notification Actions:: <https://docs.typo3.org/c/typo3/cms-core/12.4/en-us/Changelog/10.1/Feature-89061-IntroduceNotificationActions.html>
- JavaScript based Notifications:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/FlashMessages/NotificationApi.html#actions>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- Backend
- JavaScript

Outputting Variables

Basic usage of variables inside Fluid templates and knowledge about escaping.

Goals:

- I can find out which variables are passed to a Fluid view.
- I can output variables with the according path syntax.
- I know how Fluid escapes variable output in templates.
- I know how to disable escaping of variables.
- I also know which security risks (XSS) may occur, when disable escaping of variables.

Links:

- Passing Variables from Typoscript FLUIDTEMPLATE:: <https://docs.typo3.org/m/typo3/reference-typoscript/12.4/en-us/ContentObjects/Fluidtemplate/Index.html#variables>
- Fluid: Using variables example: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Fluid/Syntax.html#variables>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- Templating with Fluid

PHP

Ability to develop and execute PHP scripts.

Goals:

- I know how to execute PHP scripts in my local environment.
- I know how PHP is executed by a web server.
- I can develop functionality in PHP.

Links:

- PHP.net: <https://www.php.net/>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Architecture for Extensions

Tags:

- TYPO3
- Structure
- PHP

PHP Code Style Tools

This skill covers tools for automatic code formatting in PHP.

Goals:

- I know about standard tools for code formatting in PHP.
- I know how to use the tools.
- I know how to integrate the tools into workflows like CI Pipelines.

Links:

- GitHub: PHP_CodeSniffer: https://github.com/squizlabs/PHP_CodeSniffer
- PHP Coding Standards Fixer Website: <https://cs.symfony.com/>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Quality

Tags:

PHP autoloading standards

The different PHP autoloading standards (PSR-4, class maps), how they map PHP classes to files and folders, and how the PSR-4 autoloading is configured.

Goals:

- I know where to place the class file for a certain class in a certain namespace when using PSR-4 autoloading.
- I can set up a proper PSR-4 autoloading configuration.
- I know how to debug and solve problems related to autoloading.

Links:

- Configuring Autoloading for composer extensions: <https://getcomposer.org/doc/04-schema.md#autoload>
- Configuring Autoloading for composer extensions: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/FileStructure/ComposerJson.html>
- PSR-4: Autoloading Standard: <https://www.php-fig.org/psr/psr-4/>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- General Extension Architecture

Tags:

- PSR
- PHP

PSR Standards

Knowing the most important PSR programming standards in the TYPO3 world.

Goals:

- I know what PSR is.
- I know the topics the most important standards cover.

Links:

- PSR Overview: <https://www.php-fig.org/psr/>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Architecture for Extensions

Tags:

- TYPO3
- PHP
- Coding Standards
- Structure
- PSR

PSR-11: Symfony Dependency Management/Injection

This skill covers different types of dependency injection in TYPO3 and the configuration of dependency injection.

Goals:

- I can configure my extension to make use of PSR-11 dependency injection.
- I know the different approaches to dependency injection in TYPO3.
- I can decide which classes can be or need to be public.
- I know how to debug problems with dependency injection.

Links:

- TYPO3 Explained: Dependency Injection:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/DependencyInjection/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- PHP
- PSR

PSR-14: Event Dispatching

This skill covers the basics of the PHP standard on Event dispatching.

Goals:

- I know the four use cases of events specified by PSR-14.
- I know about the different components of a PSR-14-compliant event system (Listener, Emitter, Dispatcher, ListenerProvider).
- I know when mutable or immutable events should be used.

Links:

- Meta-document on PSR-14 with background information: <https://www.php-fig.org/psr/psr-14/meta/>
- The PSR-14 standard: <https://www.php-fig.org/psr/psr-14/>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Architecture for Extensions

Tags:

- PSR
- PHP

PSR-15: Middlewares

This skill covers the PHP standard on middlewares.

Goals:

- I know what middlewares and request handlers are specified in PSR-15 and how they relate to each other.

Links:

- PSR-15: HTTP Server Request Handlers: <https://www.php-fig.org/psr/psr-15/>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Structure
- PSR
- PHP

PSR-17: HTTP Message Factories

This skill covers the PSR standard for HTTP message factories and the differences to the earlier HTTP request/response standard.

Goals:

- I know about the various interfaces provided by PSR-17 and their different purposes
- I know why PSR-17 was created and the differences to PSR-7

Links:

- PSR-17 meta document: <https://www.php-fig.org/psr/psr-17/meta/>
- PSR-17 standard: <https://www.php-fig.org/psr/psr-17/>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- PHP
- PSR

PSR-18: HTTP Client

This skill covers the PSR HTTP client standard.

Goals:

- I know about the client interface provided by PSR-18.

Links:

- Meta document for PSR-18 with background information: <https://www.php-fig.org/psr/psr-18/meta/>
- PSR-18 standard: <https://www.php-fig.org/psr/psr-18/>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- PHP
- PSR

PSR-3: Logger Interface standard

Knowledge about the PSR-3 logging standard for PHP.

Goals:

- I know about the interfaces defined by PSR-3.
- I know about the standard implementations of PSR-3.
- I know the API methods the PSR-3 LoggerInterface provides for writing log messages.
- I can use PSR-3-based logging in my own extensions.

Links:

- PSR-3: Logger Interface: <https://www.php-fig.org/psr/psr-3/>
- Meta Document for PSR-3 with background information: <https://www.php-fig.org/psr/psr-3/meta/>
- Monolog documentation: Usage: <https://seldaek.github.io/monolog/doc/01-usage.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- PHP
- PSR
- TYPO3
- Debugging
- Logging

PSR-7: Request/Response

This skill covers the PSR standard for HTTP request/response objects.

Goals:

- I have basic knowledge about the standard PSR-7.
- I know how to deal with request and response objects in PHP.

Links:

- PSR-7: HTTP message interfaces (official standard): <https://www.php-fig.org/psr/psr-7/>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- VERIFY-TCCD
- PHP
- Structure
- PSR

PageTitle API

This skill covers the PageTitle API, which can be used to flexibly modify the title of the generated page, e.g. in the single view of a plugin.

Goals:

- I know about the structure of the PageTitle API.
- I can implement and register custom PageTitleProviders to modify the document's title.

Links:

- TYPO3 Explained: PageTitle API: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Seo/PageTitleApi.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Frontend

Pagination API

The abstraction for paginations provided by the TYPO3 Core.

Goals:

- I know how to apply pagination to result arrays.
- I know how to apply pagination to extbase query results
- I know the different types of pagination the Core provides.

Links:

- TYPO3 Explained: Pagination: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Pagination/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Performance analysis for custom code

This skill covers the process of analysing performance of a TYPO3 system.

Goals:

- I know common performance metrics
- I know how to analyze the performance of a TYPO3 site
- I know how to analyze the performance of my custom plugins
- I know where to get a first overview of the rendering performance

Links:

- MariaDB Manual: EXPLAIN Syntax: <https://mariadb.com/kb/en/explain/>
- Blackfire.io: <https://www.blackfire.io/>
- XDebug: Profiler: <https://xdebug.org/docs/profiler>
- TYPO3 Admin Panel: Inspecting Query Information: <https://docs.typo3.org/c/typo3/cms-adminpanel/12.4/en-us/Inspecting/Debug/Index.html#query-information>
- TYPO3 Admin Panel: Inspecting TypoScript: <https://docs.typo3.org/c/typo3/cms-adminpanel/12.4/en-us/Inspecting/TypoScript/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Quality

Tags:

Prepared Statements

This skill covers the concept of Prepared Statements in relational databases.

Goals:

- I know what prepared statements are and what their purpose is
- I know how they improve security and against which attack vectors they are useful.

Links:

- Wikipedia: Prepared Statement:: https://en.wikipedia.org/wiki/Prepared_statement

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Security

Tags:

- Database Handling
- Relational databases

Providing own events

The focus of this skill is providing custom events within the TYPO3 PSR-14 implementation.

Goals:

- I can create events for my custom extensions and dispatch them with the Core's EventDispatcher.
- I know how to implement the different event use cases specified in PSR-14

Links:

- TYPO3 Core Changelog entry for event dispatching: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Events/EventDispatcher/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- Events

Registering Backend Modules

This skill covers the registration of a backend module to make it available to users.

Goals:

- I can register backend modules based on Extbase.
- I can register backend modules without Extbase.

Links:

- Backend Module with Core Functionality:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/HowTo/BackendModule/CreateModule.html>
- Backend Module with Extbase:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/HowTo/BackendModule/CreateModuleWithExtbase.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Extbase
- Backend

Registering Frontend Plugins

This skill covers the registration of a frontend plugin to make it available to users.

Goals:

- I know how to register a plugin with and without Extbase.
- I know how to register a plugin/controller as a content element.
- I know how to declare actions as uncached in Extbase.
- I know how to register a cached or uncached plugin without Extbase.

Links:

- Registering and configuring Plugins with and without Extbase: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Extbase/Reference/FrontendPlugins.html#extbase-registration-of-frontend-plugins>
- TypoScript Reference: USER and USER_INT: <https://docs.typo3.org/m/typo3/reference-typo3/11.5/en-us/ContentObjects/UserAndUserInt/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Frontend
- Extbase
- Extensions

Request processing with middlewares

This skill covers the usage of PSR-15 middlewares in TYPO3 - both for frontend and backend request processing.

Goals:

- I understand how the core leverages middlewares to modularize request processing (middleware dispatcher, chained middlewares, ...).
- I know how to find out which middlewares are configured and their order of execution.
- I can write my own middlewares and add them to the frontend and backend request processing.
- I can overwrite Core-provided middlewares.

Links:

- TYPO3 Explained: Request Handling & Middlewares: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/RequestLifeCycle/Middlewares.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3

Rich Text Editor API

Modifying CKeditor's configuration programmatically: You can modify existing or add complete new configurations

Goals:

- I know how to configure the Rich Text Editor in TYPO3.
- I know how to modify YAML configuration, programatically, using events.
- I know how to plug in a custom RTE.

Links:

- TYPO3 ChangeLog: Introduce events to modify CKEditor configuration: <https://docs.typo3.org/c/typo3/cms-core/master/en-us/Changelog/10.3/Feature-88818-IntroduceEventsToModifyCKEditorConfiguration.html>
- TYPO3 Explained: Rich Text Editors: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Rte/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- RTE

Route Enhancers

This skill covers route enhancers which are used to amend the URL routing provided by the TYPO3 core.

Goals:

- I know what Route Enhancers are and about the different types that the Core provides.

Links:

- TYPO3 Explained: Advanced routing configuration: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Routing/AdvancedRoutingConfiguration.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- Request Handling

Software Design Patterns

This skill covers Software Design Patterns, established solutions for repeated problems in software development.

Goals:

- I know what Design Patterns are and why they are useful
- I know examples of Design Patterns used in TYPO3
- I know when to apply Design Patterns in my own code

Links:

- Martin Fowler: Catalog of Patterns of Enterprise Application Architecture: <https://martinfowler.com/eaCatalog/>
- Wikipedia: Software design pattern: https://en.wikipedia.org/wiki/Software_design_pattern

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Architecture for Extensions

Tags:

Special Input TCA Types

This skill covers specialized text input types in TCA.

Goals:

- I know about purpose defined special TCA types
- I know how to configure a basic TCA type to the same purpose
- I know how to change appearance and behavior by using 'fieldControl' technique.

Links:

- TCA Reference: Password input: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Password/Index.html>
- TCA Reference: Link input: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Link/Index.html>
- TCA Reference: Email input: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Email/Index.html>
- TCA Reference: Datetime input: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Datetime/Index.html>
- TCA Reference: Color Input: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Color/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Standard Extbase Repository

Knowing the default Repository class shipped with Extbase.

Goals:

- I know which default query methods are shipped.
- I know which restrictions apply to queries by default.
- I know how to create a repository based on the default Repository class

Links:

- TYPO3 Explained: Repository: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Tutorials/Tea/Repository.html?highlight=repository>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Extbase
- Persistence
- Repository

Static code analysis

Developing and maintaining large code bases can be cumbersome. Tools providing static code analysis can help.

Goals:

- I know what static code analysis is and why it is useful.
- I know how to integrate static analysis tools into workflows.
- I know some popular and widely used static analysis tools for PHP

Links:

- SonarQube: Website: <https://www.sonarsource.com/products/sonarqube/>
- Psalm: Website: <https://psalm.dev/>
- PhpStan: Website: <https://phpstan.org/>
- Wikipedia: Static program analysis: https://en.wikipedia.org/wiki/Static_program_analysis

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Quality

Tags:

TCA Types for Basic Input

This skill groups knowledge about TCA Types that define input possibilities.

Goals:

- I know how to define basic input fields by using TCA types
- I know how to change appearance and behavior of the fields by using renderTypes

Links:

- TCA Reference: Text areas & RTE: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Text/Index.html>
- TCA Reference: Select field: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Select/Index.html>
- TCA Reference: Radiobutton input: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Radio/Index.html>
- TCA Reference: Number input: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Number/Index.html>
- TCA Reference: Inputs: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Input/Index.html>
- TCA Reference: Checkbox input: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Check/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

TCA Types for record relations

This skill covers TCA configuration options to define relations to other records.

Goals:

- I know about TCA types that define record relations
- I know how to use `renderType` for those types to change appearance and behavior

Links:

- TCA Reference: columnsOverrides: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/Types/Properties/ColumnsOverrides.html>
- TCA Reference: Inline Relational Record Editing (IRRE): <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Inline/Index.html>
- TCA Reference: Select fields: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Select/Index.html>
- TCA Reference: Group fields: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Group/Index.html>
- TCA Reference: Category fields: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Category/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

TCA type "slug"

This skill covers the TCA type slug to create slugs for records.

Goals:

- I know how to define a field to integrate custom records into routing (TCA type slug)
- I know about `generatorOptions` to influence how the slug is generated

Links:

- TCA Reference: Type "slug": <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Slug/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

TCA types File and Folder

This skill covers the TCA types "file" and "folder", used for relations from records to files and folders.

Goals:

- I know about options to define relations from records to files/folders
- I know how to change appearance and behaviour of those relations

Links:

- TCA Reference: Type "folder": <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/Folder/Index.html>
- TCA Reference: Type "file": <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/File/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

TYPO3 Debugging Utilities

Knowledge about debugging utilities provided by TYPO3.

Goals:

- I know the built-in mechanics to output debug messages:
 - Extbase DebuggerUtility
 - DebugUtility
 - admin panel
- I know how to add debug output to the frontend.
- I know how to add debug output to the backend.

Links:

- EXT: Admin Panel:: Configuration: <https://docs.typo3.org/c/typo3/cms-adminpanel/12.4/en-us/Configuration/Index.html>
- TYPO3 Explained: Debugging: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Debugging/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Debugging

TYPO3 Message bus

This skill covers the TYPO3 message bus solution based on the Symfony Messenger component.

Goals:

- I know what the message bus is and how it works.
- I know how to create my own messages and send them over the bus.
- I know how to create handlers for messages and register them.
- I know why some messages should be handled asynchronously.

Links:

- TYPO3 Explained: Message Bus: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/MessageBus/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

TYPO3 Version API

The TYPO3 Version information API.

Goals:

- I know how to retrieve the major and branch version numbers of the current TYPO3 instance.

Links:

- Version.php source code:
<https://github.com/TYPO3/typo3/blob/12.4/typo3/sysext/core/Classes/Information/Typo3Version.php>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Table Configuration Array (TCA)

Configuring database tables for usage in the backend and frontend.

Goals:

- I know about the different sections of the TCA (ctrl, columns, palettes, ...).
- I know how to configure rendering of a table in backend forms.
- I know how the TCA controls information processing by the TYPO3 core (DataHandler).
- I know how the TCA is compiled from different extensions and cached.
- I can create a compliant TCA for my extensions.
- I can extend the TCA of existing tables from the core or other extensions.

Links:

- TCA reference: <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/>
- TYPO3 Explained: TCE & DataHandler: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Typo3CoreEngine/Index.html>
- TCA reference: <https://docs.typo3.org/typo3cms/TCAReference/>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- General Extension Architecture

Tags:

- TYPO3
- Structure
- TCA

Templates, Layouts, Partials

Fluid Templates, Layouts, Partials - their interaction and properties.

Goals:

I know

- what Fluid Templates are
- what Fluid Layouts are
- what Fluid Partials are
- how Templates, Layouts and Partials are connected

I can

- structure Templates, Layouts and Partials
- combine Templates, Layouts and Partials for templating
- use Templates, Layouts and Partials to realise a specific template example

Links:

- Fluid: Template File Structure: <https://docs.typo3.org/other/typo3fluid/fluid/main/en-us/Usage/Structure.html>
- Fluid ViewHelper Reference: Render ViewHelper: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3fluid/fluid/latest/Render.html>
- Fluid ViewHelper Reference: Layout ViewHelper: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3fluid/fluid/latest/Layout.html>
- Fluid ViewHelper Reference: Section ViewHelper: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3fluid/fluid/latest/Section.html>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- Fluid
- Templating
- HTML

The Caching Framework

This skill covers the Core's caching framework. It shows how to use existing caches and register custom caches and the types of cache frontends and backends. Additional topics are expiration and tagging of cache entries and flushing of caches.

Goals:

I can:

- use existing caches
- register and use custom caches
- decide which types of cache frontends and backends to use for which purpose

Links:

- TYPO3 Explained: Caching: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/CachingFramework/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Cache
- Caching

The System Registry API

This skill covers the system registry API, provided by the TYPO3 Core to store instance-specific data.

Goals:

- I can use the registry API to read and write data.
- I can decide when the registry makes sense to use and when not.

Links:

- TYPO3 Explained: System Registry: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/SystemRegistry/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3

The USER/USER_INT TypoScript objects

This skill covers the USER and USER_INT TypoScript objects, which are used to integrate custom code in the TYPO3 frontend rendering process.

Goals:

- I know what the USER TypoScript object is and how it relates to plugins.
- I know the differences between USER and USER_INT.

Links:

- TypoScriptReference: USER and USER_INT: <https://docs.typo3.org/m/typo3/reference-typo3/12.4/en-us/ContentObjects/UserAndUserInt/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- TypoScript
- TypoScript and Rendering
- Frontend Rendering

The builder design pattern in TYPO3

TYPO3 provides some concrete classes following the Builder design pattern.

Goals:

- I know the different TYPO3 builder implementations.
- I can use the different TYPO3 builder implementations.

Links:

- TYPO3 Explained: Content Security Policy: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/ContentSecurityPolicy/Index.html#policy-builder-approach>
- TYPO3 Explained: Backend routing: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Backend/BackendRouting.html?highlight=uribuilder#generating-backend-urls>
- TYPO3 Explained: Query builder: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Database/QueryBuilder/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Architecture for Extensions

Tags:

Tracing Errors in Logs

Knowledge about log sources and how to utilize them in order to resolve errors.

Goals:

- I know where to look when my instance throws error messages or white pages.
- I know which configuration options define the error output of TYPO3 and Extbase.
- I know how to limit error output to development machines or certain IPs on live instances.

Links:

- TYPO3 Explained: Logging Framework: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Logging/Index.html>
- TYPO3 Explained: System Log: <https://docs.typo3.org/m/typo3/reference-coreapi/10.4/en-us/ApiOverview/SystemLog/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Debugging
- Logging

User Input in DB Queries

Knowledge about securely processing user input for database queries.

Goals:

- I know what an SQL injection is.
- I know how to sanitize user input to prevent SQL injections.
- I know what other measures to take against SQL injections.

Links:

- TYPO3 Explained: Query Builder: createNamedParameter(): <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Database/QueryBuilder/Index.html#createnamedparameter>
- TYPO3 Explained: Security Guidelines for extension development: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/Security/GuidelinesExtensionDevelopment/Index.html>
- Wikipedia: SQL Injection: https://en.wikipedia.org/wiki/SQL_injection

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Security

Tags:

- TYPO3
- Security
- SQL Injection

User Input in PHP Code

Knowledge about securely processing user input in PHP code.

Goals:

- I know about vulnerabilities path traversal, arbitrary code execution and information disclosure.
- I can apply mitigations to prevent these vulnerabilities.

Links:

- Wikipedia: Directory traversal attack:: https://en.wikipedia.org/wiki/Directory_traversal_attack
- Netsparker: Information Disclosure Attacks in Web Applications:: <https://www.netsparker.com/blog/web-security/information-disclosure-issues-attacks/>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Security

Tags:

- TYPO3
- Security

User Input in Views

Knowledge about securely outputting values gained through user input.

Goals:

- I know what cross-site scripting (XSS) is.
- I know how to prevent user input from triggering XSS.

Links:

- OWASP: Cross-site Scripting: <https://owasp.org/www-community/attacks/xss/>
- OWASP: XSS Prevention Cheat Sheet: https://cheatsheetseries.owasp.org/cheatsheets/Cross_Site_Scripting_Prevention_Cheat_Sheet.html

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Security

Tags:

- TYPO3
- Security
- Cross-Site Scripting (XSS)

User-defined TCA type

This skill covers the TCA type “user”.

Goals:

- I know how to define a custom TCA field with custom rendering and behaviour
- I know the difference between the `user` type and a custom `renderType`

Links:

- TCA Reference: Custom inputs (user): <https://docs.typo3.org/m/typo3/reference-tca/12.4/en-us/ColumnsConfig/Type/User/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Using Query Restrictions

How to restrict database queries.

Goals:

- I know about the restriction containers applied automatically in TYPO3.
- I know the available restrictions and their usage.
- I know how to change which restrictions are applied.

Links:

- TYPO3 Explained: RestrictionBuilder: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ApiOverview/Database/RestrictionBuilder/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Database Handling
- DBMS
- SQL
- Doctrine

Using existing PSR-14 events

This skill covers the implementation and usage of events in the TYPO3 Core.

Goals:

- I know how the TYPO3 Core defines events and attaches listeners to events.
- I can register my own listeners for events provided by the Core, extensions and 3rd-party PHP libraries.

Links:

- List of Core PSR-14 Events: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ApiOverview/Hooks/Events/Index.html>
- TYPO3 Explained: EventDispatcher: <https://docs.typo3.org/m/typo3/reference-coreapi/11.5/en-us/ApiOverview/Hooks/EventDispatcher/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

Using the Fluid View

Knowing and understanding the different parts of a Fluid template view.

Goals:

- I understand the API of a Fluid view.
- I know the public methods that assign variables and template paths.
- I know the internal API to configure Fluid behaviour.
- I know the action of rendering a template.

Links:

- Introduction to Fluid:
<https://docs.typo3.org/m/typo3/reference-coreapi/main/en-us/ApiOverview/Fluid/Introduction.html>
- Documented example of using a Fluid view with MVC pattern:
https://github.com/TYPO3/Fluid/blob/main/examples/example_mvc.php

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- TYPO3
- Templating with Fluid

Using the PageRenderer in Extensions

This skill covers the PageRenderer for extension usage, a TYPO3 Core component that is responsible for collecting and generating information about various parts of the page and handling the final output of a page.

Goals:

- I can use the PageRenderer to modify or extend CSS, JavaScript and other header information in frontend and backend.

Links:

- TYPO3 Explained: Assets: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Assets/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- Frontend
- TYPO3

Using the QueryBuilder

How to write queries in TYPO3.

Goals:

- I know how to use the QueryBuilder built into TYPO3.
- I know how to write a secure query that can target different DBMS.
- I know how the Core QueryBuilder differs from Doctrine DBAL's QueryBuilder

Links:

- TYPO3 Explained: QueryBuilder:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Database/QueryBuilder/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Database Handling
- DBMS
- SQL
- Doctrine

Validation in Extbase

What concepts exist to validate controller action input parameters.

Goals:

- I know about annotations to validate model properties.
- I know what input parameter validation is automatically applied to controller actions.
- I know about annotated validations for controller actions.

Links:

- TYPO3 Explained: Extbase Reference: Custom Validators:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Extbase/Reference/Domain/Validator.html#extbase-domain-validator>
- TYPO3 Explained: Extbase Reference: Validation:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/Extbase/Reference/Validation.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Building Plugins/Modules with Extbase

Tags:

- TYPO3
- Extbase
- Validation

View Pattern

What is a view in MVC context.

Goals:

- I know which role the view plays in the pattern.

Links:

- Wikipedia: MVC: <https://en.wikipedia.org/wiki/Model%E2%80%93view%E2%80%93controller>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Software Architecture for Extensions

Tags:

- TYPO3
- Extbase
- MVC
- View

ViewHelper: Comment

Including comments in Fluid templates.

Goals:

- I know how to include Fluid comments in my templates.
- I know the difference between HTML comments and Fluid comments regarding the rendered HTML output.

Links:

- Fluid ViewHelper Reference: Comment ViewHelper: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3fluid/fluid/latest/Comment.html>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- Templating with Fluid
- ViewHelper

ViewHelper: Debug

Utilising output to access Fluid variables.

Goals:

- I know how to use the debug ViewHelper to output variables available to Fluid.
- I know what makes this ViewHelper more appropriate than using a simple echo in my controller.

Links:

- Fluid ViewHelper Reference: Debug ViewHelper: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3fluid/fluid/latest/Debug.html>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- TYPO3
- Debugging

ViewHelper: For-Loop

Iterating through a list with the for ViewHelper.

Goals:

- I know how to cycle through items with the help of the for ViewHelper inside my Fluid templates.
- I also know how to utilize the iteration object within a cycle.

Links:

- Fluid ViewHelper Reference: For-Loop ViewHelper: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3fluid/fluid/latest/For.html>
- Fluid ViewHelper Reference: Grouped-Loop ViewHelper: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3fluid/fluid/latest/GroupedFor.html>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- Templating with Fluid
- ViewHelper

ViewHelper: Form

The TYPO3 CMS form ViewHelper for Fluid.

Goals:

- I know how Extbase forms can be created in Fluid templates.
- I know how data can be filled into form fields.
- I know how to connect object properties and form fields.
- I can create a form and connect it to an object.
- I can use the different view helpers to create form fields.
- I know how Extbase ensures that no additional fields are passed by malicious actors.

Links:

- Fluid ViewHelper Reference: f:form ViewHelper:: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3/fluid/latest/Form.html>
- Fluid ViewHelper Reference: f:form ViewHelper namespace:: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3/fluid/latest/Form/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Templating and Other Outputs

Tags:

- TYPO3
- Extbase
- Fluid
- View

ViewHelper: Format

Using Fluid Format ViewHelpers.

Goals:

- I know how to use Fluid's format ViewHelper and its arguments and purposes.

Links:

- Fluid ViewHelper Reference: Format ViewHelper (typo3/fluid):
<https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3/fluid/latest/Format/Index.html>
- Fluid ViewHelper Reference: Format ViewHelper (typo3fluid/fluid):
<https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3fluid/fluid/latest/Format/Index.html>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- TYPO3
- Templating with Fluid
- ViewHelper

ViewHelper: If/Else

Creating if/else statements within Fluid templates.

Goals:

- I can create an if/else statement in my templates with the help of the according Fluid ViewHelper.
- I can apply conditions using the inline notation of Fluid.

Links:

- Fluid ViewHelper Reference: If/Else ViewHelper: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3fluid/fluid/latest/If.html>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- Templating with Fluid
- ViewHelper

ViewHelper: Image

Using the Fluid ViewHelper `f:image()`.

Goals:

- I know the important arguments of `f:image()` ViewHelper (image, src, crop, cropVariant, loading) and how to use the ViewHelper.

Links:

- Fluid ViewHelper Reference: Image ViewHelper: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3/fluid/latest/Image.html>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- TYPO3
- Templating with Fluid
- ViewHelper

ViewHelper: Link, Uri

Using the Fluid ViewHelpers `f:link.*` and `f:uri.*`.

Goals:

- I know the ViewHelpers of the `f:link.*` family such as `f:link.typolink`, `f:link.email` etc. and their important arguments.
- I know the ViewHelpers of the `f:uri.*` family and their important arguments.
- I know how to use the `f:link.*` and `f:uri.*` ViewHelpers properly.

Links:

- Fluid ViewHelper Reference: Link ViewHelper: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3/fluid/latest/Link/Index.html>
- Fluid ViewHelper Reference: URI ViewHelper: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3/fluid/latest/Uri/Index.html>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- TYPO3
- Templating with Fluid
- ViewHelper

ViewHelper: Render

Using `f:render` to render sections and partials as well as passing arguments.

Goals:

- I can use `f:render` in my templates to render sections and partials.
- I can pass arguments (along with optional flagging).

Links:

- Fluid ViewHelper Reference: Render ViewHelper: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3fluid/fluid/latest/Render.html>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- Templating with Fluid
- ViewHelper

ViewHelpers

Getting to know what a ViewHelper is.

Goals:

- I know what ViewHelpers are.
- I know what a Namespace is.
- I can use ViewHelpers in my template.
- I know which ViewHelpers are shipped by stand-alone Fluid, and which are provided by TYPO3 CMS.

Links:

- Fluid ViewHelper Reference: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/Index.html>
- TYPO3 Explained: Fluid: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Fluid/Index.html>
- Fluid: What are ViewHelpers?: https://github.com/TYPO3/Fluid/blob/main/doc/FLUID_VIEWHELPERS.md#what-are-viewhelpers
- Fluid: Using ViewHelpers in templates: https://github.com/TYPO3/Fluid/blob/main/doc/FLUID_VIEWHELPERS.md#using-viewhelpers-in-templates

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- Templating with Fluid
- ViewHelper

Web Vulnerability Types

Knowledge about possible vulnerabilities in web development.

Goals:

- I know what cross-site scripting (XSS) is.
- I know what arbitrary code execution is.
- I know what an SQL injection is.
- I know how I can prevent these vulnerabilities in my code.

Links:

- OWASP: Vulnerability: <https://owasp.org/www-community/vulnerabilities/>
- TYPO3 Explained: Security Guidelines: Types of Security Threats::
<https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/Security/TypesOfThreats/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Security

Tags:

- TYPO3
- Security
- Cross-Site Scripting (XSS)
- SQL Injection

What is Fluid?

Definition of Fluid and its possible use with regards to the Model View Controller pattern.

Goals:

- I can explain what Fluid is.
- I can define its role in the context of a MVC system.

Links:

- typo3.org: Fluid Template Engine: <https://typo3.org/fluid>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Templating and Other Outputs

Tags:

- Templating with Fluid

What is MVC?

The MVC pattern, what it can be used for, and common implementations.

Goals:

- I have a basic understanding of what MVC is.

Links:

- Wikipedia: MVC (Model-View-Controller):
<https://en.wikipedia.org/wiki/Model%E2%80%93view%E2%80%93controller>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Software Architecture for Extensions

Tags:

- Design patterns
- Templating with Fluid

What is SQL?

Knowledge about how to access and manipulate data in DBMS.

Goals:

- I know where to find information about SQL.
- I know how to issue queries against my local setup.

Links:

- Wikipedia: SQL: <https://en.wikipedia.org/wiki/SQL>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- General Extension Architecture

Tags:

- TYPO3
- Database Handling
- DBMS
- SQL

What is a Templating Engine?

Introduction to the basic concept of a templating engine/processor.

Goals:

- I can explain what the basic concept of a templating engine is.
- I can identify needed parts for a templating engine.

Links:

- wikipedia.org: Template processor: https://en.wikipedia.org/wiki/Template_processor

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Software Architecture for Extensions

Tags:

- TYPO3
- Templating with Fluid

Writing and using own Symfony Expressions

This skill covers the Symfony Expression syntax used in e.g. TypoScript conditions and ways to extend that functionality with custom code.

Goals:

- I know the Symfony component "Expression Language" and its syntax.
- I can write and register my own ExpressionFunctionProviders.
- I can provide custom TypoScript conditions using my own ExpressionFunctionProviders.
- I know where expressions are used in site configurations.

Links:

- TypoScriptReference: Conditions:: <https://docs.typo3.org/m/typo3/reference-typoscript/12.4/en-us/Conditions/Index.html>
- The ExpressionLanguage Component:: https://symfony.com/doc/6.2/components/expression_language.html
- TYPO3 Site Handling: Base Variants (based on Symfony Expressions):: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/SiteHandling/BaseVariants.html>
- TYPO3 Explained: Typoscript Conditions:: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/Configuration/TypoScript/Syntax/Conditions/Index.html>

Maintainer:

TYPO3 (Andreas Wolf)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- TypoScript

XLIFF / locallang.xlf

Working with XLIFF files in TYPO3 for multilingual websites. Includes writing and extending XLIFF files, overriding translations in TypoScript, and using the f:translate ViewHelper.

Goals:

- I know what XLIFF is.
- I know how to write and extend an XLIFF file.
- I know how to introduce new languages and generate the needed XLIFF file.
- I know how to override the translations of an extension in TypoScript.
- I know how to access the translations with the f:translate-Viewhelper

Links:

- TYPO3 Explained: Managing translations for backend: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Localization/ManagingTranslations.html>
- TYPO3 Explained: XLIFF Format: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ApiOverview/Localization/XliffFormat.html>
- Fluid ViewHelper Reference: <https://docs.typo3.org/other/typo3/view-helper-reference/12.4/en-us/typo3/fluid/latest/Translate.html>
- TypoScript Reference: Properties for all frontend plugin types: <https://docs.typo3.org/m/typo3/reference-typo3script/12.4/en-us/TopLevelObjects/Plugin.html#local-lang-key-label-key>
- TypoScript Reference: FLUIDTEMPLATE property extbase.controllerExtensionName: <https://docs.typo3.org/m/typo3/reference-typo3script/12.4/en-us/ContentObjects/Fluidtemplate/Index.html#extbase-controllerextensionname>
- TYPO3 Explained: Output localized strings with Typoscript: <https://docs.typo3.org/m/typo3/reference-coreapi/12.4/en-us/ExtensionArchitecture/HowTo/Localization/TypoScript.html>

Maintainer:

TYPO3 (Oliver Thiele)

Domain Tag:

- Core Architecture & APIs

Tags:

- TYPO3
- Forms
- XLIFF
- Translation
- Internationalization