TYPO3 Frontend Rendering Process

TYPO3

- (start) → **1** define path constants → **2** define constants
- ◇ no success / end with error → (end)
- **3** init time tracking
- **4** include mandatory libraries
- **5** include configuration
- ◇ no success / end with error → (end)
- **6** init db-wrapper object
- **7** check environment
- ◇ insufficient PHP version / end with error → (end)
- **8** check extension ID (eID)
- **9** include FE libraries
- **10** init FE-object ($TSFE)
- **11** open DB-connection

🪝 tslib_fe-PostProc

🪝 connectToDB

- ◇ no success / end with error → (end)
- ◇ keyword preview → **12** re-init FE-object ($TSFE) → **13** ADMCMD_preview
- ◇ RDCT set / Redirect URL → **14** send redirect → (end)
- **connect 2**

Legend

GLOBAL (index.php)	(orange)
GLOBAL (typo3/sysext/cms/tslib/index_ts.php)	(green)
tslib_fe / $TSFE (typo3/sysext/cms/tslib/class.tslib_fe.php)	(yellow)
🪝 = Hook	

Page 1

connect 2

compression level set

15
start output buffering

16
init FE-user

Initialise object

preBeUser

BE user cookie exists

17
init „logged in" BE-user

draft preview

18
init BE-user for preview

workspace preview mode

19
init workspace preview

20
check alternative ID methods

checkAlternativeIdMethods-PostProc

21
determine page ID

22
validate cache hash

page cHash mismatch / end with error

23
get compressed TCA

initialise object

24
init template

25
get page from cache

headerNoCache

26
get config array

27
convert POST charset

28
setting language and locale

connect 3

Legend

GLOBAL
(typo3/sysext/cms/tslib/index_ts.php)

tslib_fe / $TSFE
(typo3/sysext/cms/tslib/class.tslib_fe.php)

tslib_feUserAuth / $TSFE->fe_user
extends t3lib_userAuth
(typo3/sysext/cms/tslib/class.tslib_feuserauth.php)

t3lib_TStemplate / $TSFE->tmpl
(t3lib/class.t3lib_tstemplate.php)

= hook

connect 3

29
set jump URL

30
check data submission

🪝 checkDataSubmission

🪝 sendFormmail-PreProcClass

no cached record found for this page

31
generate the page

non chached objects

32
include non-cached objects

🪝 isOutputting

process page output

🪝 contentPostProc-output

external scripts

include external scripts

35
page outputting

36
$TSFE: store session data

37
save hit statistics

🪝 sys_stat-PreProcClass

jump URL set

38
check jump URL

preview mode

39
show preview info

🪝 hook_eofe

admin panel enabled

40
$TSFE: generate admin panel

compression level set

41
compress output

Legend

tslib_fe / $TSFE
(typo3/sysext/cms/tslib/class.tslib_fe.php)

tslib_feUserAuth / $TSFE->fe_user
extends t3lib_userAuth
(typo3/sysext/cms/tslib/class.tslib_feuserauth.php)

t3lib_tsfeBeUserAuth / $BE_USER
extends t3lib_beUserAuth
extends t3lib_userAuthGroup
extends t3lib_userAuth
(t3lib/class.t3lib_tsfebeuserauth.php)

🪝 = hook

16
init FE-user

16.1
init FE-user object

Initialise object

16.2
start user session

postUserLookUp

16.3
unpack uc

16.4
fetch session data

initFEuser

16.5
update „isOnline" timestamp

Legend

tslib_fe / $TSFE
(typo3/sysext/cms/tslib/class.tslib_fe.php)

tslib_feUserAuth / $TSFE->fe_user
extends t3lib_userAuth
(typo3/sysext/cms/tslib/class.tslib_feuserauth.php)

= hook

TYPO3 Frontend Rendering Process

17
init BE-User

17.1
init BE user object

Initialise object

17.2
start user session

postUserLookUp

17.3
unpack uc

17.4
fetch group data

fetchGroupQuery

fetchGroups_postProcessing

login validation failed

17.5
unset BE user initialisation

17.6
init admin panel usage

admin panel enabled

17.7
save admin panel changes

extEditAction

17.8
load FE editing classes

Legend

GLOBAL
(typo3/sysext/cms/tslib/index_ts.php)

t3lib_tsfeBeUserAuth / $BE_USER
extends t3lib_beUserAuth
extends t3lib_userAuthGroup
extends t3lib_userAuth
(t3lib/class.t3lib_tsfebeuserauth.php)

= Hook

21 dertermine page ID

21.1 set ID from ArgV

backend user logged in

21.2 get preview settings

page id existing

21.3 check if page is hidden

is live workspace

21.4 check root line

21.5 set preview flag

21.6 fetch the page ID

Check access

21.7 init user groups

21.8 fetch ID domain

page not found / end with error

21.9 fetch ID rootline

page not found / end with error

21.10 check BE user access

no read access to page

21.11 clear preview

21.12 check login allowed in branch

no login allowed in branch

determineId-PostProc

Legend

tslib_fe / $TSFE
(typo3/sysext/cms/tslib/class.tslib_fe.php)

t3lib_tsfeBeUserAuth / $BE_USER
extends t3lib_beUserAuth
extends t3lib_userAuthGroup
extends t3lib_userAuth
(t3lib/class.t3lib_tsfebeuserauth.php)

t3lib_pageSelect / $TSFE->sys_page
(t3lib/class.t3lib_page.php)

= Hook

TYPO3

31
generate the page

31.1
generate page pre processing

31.2
determine which script

use custom script

31.3
init pagegeneration

31.7
custom external script

31.4
include files

31.5
render content

31.6
setting header

31.8
generate page post processing

31.9
store page in cache

contentPostProc-all

contentPostProc-cached

pageIndexing

insertPageIncache

Legend

tslib_fe / $TSFE
(typo3/sysext/cms/tslib/class.tslib_fe.php)

TSpagegen
(sysext/cms/tslib/class.tslib_pagegen.php,
sysext/cms/tslib/pagegen.php)

external script for page generation

= Hook

1. Frontend Rendering Process (Ver 4.1.1)

No	Action Title	Filename	Function	Description
1	define path constants	index.php		-Path constants for this site and tslib - include index_ts.php
2	define constants	index_ts.php		TYPO3_OS, TYPO3_MODE - various path constants if not already set
3	init time tracking	index_ts.php	new t3lib_timeTrack	init time tracking object ($TT)
4	include mandatory libraries	index_ts.php		class.t3lib_div.php, class.t3lib_extmgm.php
5	include configuration	index_ts.php		config_default.php, class.t3lib_db.php generated from localconf.php and ext_localconf.php
6	init db-wrapper object	index_ts.php	t3lib_div::makeInstance ('t3lib_DB')	init db wrapper object ($TYPO3_DB)
7	check environment	index_ts.php		- php version, $GLOBALS - Add slashes to GET/POST arrays
8	check extension ID (eID)	index_ts.php		look for extension id to launch alternative output engine
9	include FE libraries	index_ts.php		tslib_fe.php; t3lib_page.php; 3lib_userauth.php; class.tslib_feuserauth.php; t3lib_tstemplate.php; t3lib_cs.php;
10	init FE object	index_ts.php	t3lib_div::makeInstance ClassName('tslib_fe')	init TypoScript front end object ($TSFE)
🪝	tslib_fe-PostProc	class.tslib_fe.php	tslib_fe()	Hook
11	open db connection	class.tslib_fe.php	connectToDB()	Open database connection
🪝	connectToDB	class.tslib_fe.php	connectToDB()	Hook
12	re-init FE-object	index_ts.php		keyword authenticated preview genereates a temporary preview URL which is accessible without BE login (overrides existing authentication)
13	ADMCMD_preview	class.tslib_fe.php	ADMCMD_preview_postInit()	- unsets BE user cookie - force BE user settings according preview configuration
14	send redirect	class.tslib_fe.php	sendRedirect()	Redirect to a different page (location)
15	start output buffering	index_ts.php	ob_start()	Data will not be sent to screen until output buffering ends
16	init FE user	class.tslib_fe.php	See separate diagram	Init the frontend user object ($TSFE>fe_user)
🪝	preBeUser	index_ts.php		Hook
17	init BE user	index_ts.php	See separate diagram	Init the backend user object ($BE_USER)
18	init BE user for preview	index_ts.php		Init a "dummy" backend user for preview only
19	init workspace preview	class.tslib_fe.php	workspacePreviewInit()	Init workspace preview functions
20	check alternative page ID	class.tslib_fe.php	checkAlternativeIdMethods ()	Resolve alternative request URL such as "simulate static documents" or "Real URL"
🪝	checkAlternativeIdMethods-PostProc	class.tslib_fe.php	checkAlternativeIdMethods	Hook
21	determine page ID	class.tslib_fe.php	See separate diagram	class.tslib_fe.php Determine the page id
22	validate cache hash	class.tslib_fe.php	makeCacheHash()	Create the hash string based on additional parameters in the URL if get parameter cHash is set
23	get compressed TCA	class.tslib_fe.php	getCompressedTCarray()	getting a compressed version of the TCA for the frontend editing
24	init template	class.tslib_fe.php	initTemplate()	Init the TypoScript template parser > t3lib/class.t3lib_tstemplate.php
25	get page from cache	class.tslib_fe.php	getFromCache()	Query the cache tablesfor the requested page
🪝	headerNoCache	class.tslib_fe.php	headerNoCache()	Hook
26	get config array	class.tslib_fe.php	getConfigArray()	Getting the TypoScript config array if not yet existing
27	convert POST charset	class.tslib_fe.php	convPOSTCharset()	Convert POST data to internal "renderCharset" if different from the metaCharset:
28	setting language and locale	class.tslib_fe.php	settingLanguage() settingLocale()	Setting the internal var, sys_language_uid + locale settings
29	set jump URL	class.tslib_fe.php	setExternalJumpUrl() checkJumpUrlReferer()	- set the jump URL for page type "External URL" - Checks the jumpurl referer if required

No	Action Title	Filename	Function	Description
				Jumpurl is a concept where external links are redirected from the index_ts.php script.
30	check data submission	class.tslib_fe.php	checkDataSubmission()	Process form input data
	checkDataSubmission	class.tslib_fe.php	checkDataSubmission()	Hook
	sendFormmail-PreProcClass	class.tslib_fe.php	sendFormmail()	Hook
31	generate the page	class.tslib_fe.php	See separate diagram	
32	include non-cached objects	class.tslib_fe.php	INTincScript()	Uncached user functions (USER_INT), php or java scripts
	isOutputting	class.tslib_fe.php	isOutputting()	Hook
33	process page output	class.tslib_fe.php	processOutput()	process the page before output
	contentPostProc-output	class.tslib_fe.php	processOutput()	Hook
34	include external scripts	class.tslib_fe.php		Include external php scripts
35	page outputting	index_ts.php	Echo $content	Generate output
36	$TSFE: store session data	class.tslib_fe.php	storeSessionData()	Store session data for FE user >class.tslib_feuserauth.php
37	save hit statistics	class.tslib_fe.php	statistics()	Save hit statistics for page
	sys_stat-PreProcClass	class.tslib_fe.php	Statistics()	Hook
38	check Jump URL	class.tslib_fe.php	jumpurl()	Sends a header 'Location' to jumpurl, if jumpurl is set
39	show preview info	class.tslib_fe.php	previewInfo()	Generate red preview information box
	hook_eofe	index_ts.php		Hook
40	$TSFE:generate admin panel	class.t3lib_tsfebeuserauth.php	extPrintFeAdminDialog()	Generate admin panel options if applicable
41	compress output	class.tslib_fe.php	gzip_encode()	Compress output if compression level set

2. Initialise Frontend User

No	Action Title	Filename	Function	Description
16.1	init FE user object	class.tslib_feuserauth	$TSFE>initFEuser()	Init object $TSFE>fe_user
16.2	start user session	class.t3lib_userauth.php	Start()	- check and set login security level (normal, challenged, superchallenged) - check if a password/username was sent and if so, try to authenticate the user - Lookup a session attached to a user and check timeout etc. - Garbage collection, setting of no-cache headers.
🪝	postUserLookUp	class.t3lib_userauth.php	start()	Hook
16.3	unpack uc	class.t3lib_userauth.php	unpack_uc()	Unpack user configuration. Contains various user specific settings for page. (e.g state of pagetree, adminpanel)
16.4	fetch session data	class.tslib_feuserauth	fetchSessionData()	- Fetches the session data for the user (from the fe_session_data table) based on the ->id of the current user-session - delete old session data (older than 24 hrs).
🪝	initFEuser	class.tslib_fe.php	initFEuser()	Hook
16.5	update "is online" timestamp	class.tslib_fe.php	initFEuser()	Update timestamp every 60 seconds

3. Initialise Backend User

No	Action Title	Filename	Function	Description
17.1	init BE user	index_ts.php class.t3lib_tsfebeuserauth.php	makeInstance ('t3lib_tsfeBeUserAuth')	Init object SBE_user
17.2	start user session	class.t3lib_userauth.php	Start()	- check and set login security level (normal, challenged, superchallenged) - check if a password/username was sent and if so, try to authenticate the user - Lookup a session attached to a user and check timeout etc. - Garbage collection, setting of no-cache headers.
🪝	postUserLookUp	class.t3lib_userauth.php	start()	Hook
17.3	unpack uc	class.t3lib_userauth.php	unpack_uc()	Unpack user configuration
17.4	fetch group data	class.tslib_feuserauth	fetchGroupData()	- fetch FE groups which the current FE user is member of - accumulate user and group TS config
🪝	fetchGroupQuery	class.t3lib_userauthgroup.php	fetchGroups()	Hook
🪝	fetchGroups_post Processing	class.t3lib_userauthgroup.php	fetchGroups()	Hook
17.5	unset BE user initialisation	index_ts.php		Unset BE user initialisation if login validation failed - check lock to ip - check backend access settings
17.6	init admin panel usage	class.t3lib_tsfebeuserauth.php	extInitFeAdmin()	
17.7	save admin panel changes	class.t3lib_tsfebeuserauth.php	extSaveFeAdminConfig()	Save any changes in admin panel settings
17.8	load FE editing classes	index_ts.php		class.t3lib_tcemain.php, class.t3lib_tceforms.php, class.t3lib_iconworks.php, class.t3lib_loaddbgroup.php, class.t3lib_transferdata.php
🪝	extEditAction	class.t3lib_tsfebeuserauth.php	extEditAction()	

4. Determine Page ID

No	Action Title	Filename	Function	Description
21.1	set ID from ArgV	class.tslib_fe.php	setIDfromArgV()s	This checks if there are ArgV-parameters in the QUERY_STRING and if so, those are used for the id
21.2	get BE user preview settings	class.tslib_fe.php		If there is a Backend login check for any preview settings:
21.3	check if page is hidden	class.tslib_fe.php		Now it's investigated if the raw page-id points to a hidden page and if so, the flag is set.
21.4	check root line	class.tslib_fe.php	makeInstance ('t3lib_pageSelect') Init()	For Live workspace: Check root line for proper connection to tree root (done because of possible preview of page / branch versions)
21.5	set preview flag	class.tslib_fe.php		- The preview flag will be set if a backend user is in an offline workspace -If the front-end is showing a preview, caching MUST be disabled.
21.6	fetch the page ID	class.tslib_fe.php	fetch_the_id()	- This gets the id of the page, checks if the page is in the domain and if the page is accessible - init pageSelect object, preview settings
21.7	init user groups	class.tslib_fe.php	initUserGroups() setSysPageWhereClause()	- init user groups - extract id from URL
21.8	fetch ID domain	class.tslib_fe.php	findDomainRecord() getFirstWebPage()	- check the first visible page of the current domain
21.9	fetch ID rootline	class.tslib_fe.php	getPageAndRootlineWithDomain()	- get page and rootline arrays - if page is not accessible, fetch previous page in rootline - if page type is shortcut, fetch rootline of shortcut target page
21.10	check be user access	t3lib_userauthgroup.php	doesUserHaveAccess()	Check if backend user has read access to this page. If not, recalculate the id.
21.11	clear preview	class.tslib_fe.php		
21.12	check login allowed in branch	class.tslib_fe.php	checkIfLoginAllowedInBranch()	Checks if user logins are blocked for a certain branch and if so, will unset user login and re-fetch ID
🪝	determineId-PostProc			

5. Generate Page

No	Action Title	Filename	Function	Description
31.1	generate page pre processing	class.tslib_fe.php	generatePage_preProcessing()	store temporary temporary user message in cache table. (Page is being generated..)
31.2	determine which script	class.tslib_fe.php	generatePage_whichScript()	Determines to include custom or pagegen.php script. Returns script-filename if a TypoScript (config) script is defined and should be include instead of pagegen.php
31.3	init pagegen	class.tslib_pagegen.php	pagegenInit()	Setting some vars in TSFE, primarily based on TypoScript config settings.
31.4	include files	class.tslib_pagegen.php	getIncFiles()	Returns an array with files to include. These files are the ones set up in TypoScript config.
31.5	render content	class.tslib_pagegen.php	renderContent()	Rendering the page content
31.6	setting header	class.tslib_pagegen.php	TSpagegen::renderContentWithHeader	rendering normal HTML-page with header by wrapping the generated content ($pageContent) in body-tags and setting the header accordingly.
31.7	custom external script	class.tslib_fe.php		Generate from custom external script
31.8	generate page post processing	class.tslib_fe.php	generatePage_postProcessing()	caching and indexing the page
🪝	contentPostProc-all	class.tslib_fe.php	generatePage_postProcessing()	Hook
🪝	contentPostProc-cached	class.tslib_fe.php	generatePage_postProcessing()	Hook
🪝	pageIndexing	class.tslib_fe.php	generatePage_postProcessing()	Hook
🪝	insertPageIncache	class.tslib_fe.php	realPageCacheContent()	Hook
31.9	store page in cache		realPageCacheContent()	