# **Stride Configuration Spec**

Version: S3.7.0-D1

An **in-depth reference** for authoring configuration files for **Stride**, walking you through every section, field, pattern rule, and real-world tip. Use the detailed examples and "gotchas" to ensure your config files behave exactly as you expect.

# Multi-Format Support

Stride now supports multiple configuration formats:

```
YAML (default) - .yaml, .yml
JSON - .json
TOML - .toml
XML - .xml
```

## **Format Detection**

Stride automatically detects your configuration format based on the file extension:

```
# Auto-detected formats
stride extract -c config.yaml # YAML
stride extract -c config.json # JSON
stride extract -c config.toml # TOML
stride extract -c config.xml # XML
```

## Manual Format Override

Use the --override-type-detection flag to force a specific format:

```
# Force YAML parsing even with different extension
stride extract -c myconfig.txt --override-type-detection=yaml

# Force JSON parsing
stride extract -c settings.cfg --override-type-detection=json

# Force TOML parsing (case insensitive)
stride extract -c build.conf --override-type-detection=TOML

# Force XML parsing
stride extract -c settings.cfg --override-type-detection=xml
```

Supported override values: yaml, yml, json, toml, xml (case insensitive)

# **Configuration Format Examples**

The same configuration can be written in any supported format:

## YAML Example

```
output_structure:
    "#/images":
    description: "Artwork & screens"
    create: true

zip_sources:
    - url: "https://example.com/archive.zip"
    name: "Example Archive"
    target_dir: "#/data"
    include_directories: ["src", "docs"]
```

## JSON Example

```
{
  "output_structure": {
    "#/images": {
        "description": "Artwork & screens",
        "create": true
    }
},

"zip_sources": [
    {
        "url": "https://example.com/archive.zip",
        "name": "Example Archive",
        "target_dir": "#/data",
        "include_directories": ["src", "docs"]
    }
}
```

## **TOML Example**

```
[output_structure."#/images"]
description = "Artwork & screens"
create = true

[[zip_sources]]
url = "https://example.com/archive.zip"
name = "Example Archive"
target_dir = "#/data"
include_directories = ["src", "docs"]
```

## XML Example

```
<pr
```

## Format-Specific Conventions

## **YAML Conventions**

- 1. Indentation: Always use 2 spaces per level—no tabs.
- Strings & Quoting: URLs and simple keys rarely need quotes. If a string contains: , #, leading/trailing whitespace or special characters, wrap it in double quotes.
- 3. Comments: Use # for comments—YAML will ignore everything after it on the line.

## **JSON Conventions**

- 1. No Comments: JSON doesn't support comments.
- 2. Strict Syntax: All strings must be quoted, no trailing commas allowed.
- 3. Escaping: Use  $\$  for quotes within strings,  $\$  for backslashes.

## **TOML Conventions**

- 1. Comments: Use # for comments like YAML.
- 2. Tables: Use [section] for objects, [[array]] for arrays of objects.
- 3. Strings: Basic strings use double quotes, literal strings use single quotes.

#### XML Conventions

- 1. Comments: Use <!-- comment --> for comments.
- 2. Attributes vs Elements: Use path attribute for directory keys, elements for values.
- 3. Escaping: Use & amp; for & , & lt; for < , & gt; for > , & quot; for ".
- 4. Boolean Values: Use true / false as text content.
- 5. Arrays: Repeat element names for array items (e.g., multiple <source> elements).

# output\_structure : Pre-Create Directories

This block lets you declare **named output folders** you want created before any downloads start. It's purely "mkdir-style" bookkeeping.

#### YAML:

```
output_structure:
   "#/images":
```

```
description: "Artwork & screens"
  create: true
"#/archives/raw":
  description: "Raw ZIPs for diagnostics"
  create: true
"#/cache":
  description: "Caching internal files"
  create: false
```

JSON:

```
"output_structure": {
    "#/images": {
        "description": "Artwork & screens",
        "create": true
    },
    "#/archives/raw": {
        "description": "Raw ZIPs for diagnostics",
        "create": true
    },
    "#/cache": {
        "description": "Caching internal files",
        "create": false
    }
}
```

TOML:

```
[output_structure."#/images"]
description = "Artwork & screens"
create = true

[output_structure."#/archives/raw"]
description = "Raw ZIPs for diagnostics"
create = true

[output_structure."#/cache"]
description = "Caching internal files"
create = false
```

XML:

## • Key syntax:

- # will be replaced by the CLI's --output directory (e.g. if you pass --output=build, "#/images" | build/images).
- You can nest arbitrarily: "#/foo/bar/baz".

#### • Fields:

- description (string): for your logs & team reference.
- create (boolean): if true, Stride runs fs::create\_dir\_all() here.

## • When to use:

- Guarantee folder existence for subsequent extraction.
- Document your output layout for teammates.

## 2. zip\_sources: Download & Extract ZIP Archives

Each entry in zip\_sources follows this full schema:

#### YAML:

```
zip_sources:
    url: "https://example.com/archive.zip" # (required) download link
    name: "Example Archive" # (required) identifier
    target_dir: "#/data" # where to extract; default "#"
    include_files: ["README.md", "LICENSE"] # exact filenames to whitelist
    exclude_files: ["debug.log", "secret.txt"] # exact filenames to blacklist
    include_patterns: ["*.so", "bin/*"] # glob patterns to whitelist
    exclude_patterns: ["*_test.rs", "old_*"] # glob patterns to blacklist
    include_directories: ["src", "docs"] # exact directory paths to whitelist
    exclude_directories: ["test", "examples"] # exact directory paths to blacklist
    preserve_structure: true # keep internal directory tree?
    strip_root_folder: "archive-main" # Use this directory as archive root instead
```

Note: include\_\* and exclude\_\* can never coexist.

## JSON:

```
{
  "zip_sources": [
    {
        "url": "https://example.com/archive.zip",
        "name": "Example Archive",
        "target_dir": "#/data",
        "include_files": ["README.md", "LICENSE"],
```

```
"exclude_files": ["debug.log", "secret.txt"],
    "include_patterns": ["*.so", "bin/*"],
    "exclude_patterns": ["*_test.rs", "old_*"],
    "include_directories": ["src", "docs"],
    "exclude_directories": ["test", "examples"],
    "preserve_structure": true,
    "strip_root_folder": "archive-main"
    }
]
```

#### TOML:

```
[[zip_sources]]
url = "https://example.com/archive.zip"
name = "Example Archive"
target_dir = "#/data"
include_files = ["README.md", "LICENSE"]
exclude_files = ["debug.log", "secret.txt"]
include_patterns = ["*.so", "bin/*"]
exclude_patterns = ["*_test.rs", "old_*"]
include_directories = ["src", "docs"]
exclude_directories = ["test", "examples"]
preserve_structure = true
strip_root_folder = "archive-main"
```

## XML:

```
<zip_sources>
  <source>
    <url>https://example.com/archive.zip</url>
    <name>Example Archive</name>
    <target_dir>#/data</target_dir>
    <include_files>
      <file>README.md</file>
      <file>LICENSE</file>
    </include_files>
    <exclude_files>
      <file>debug.log</file>
      <file>secret.txt</file>
    </exclude_files>
    <include_patterns>
      <pattern>*.so</pattern>
      <pattern>bin/*</pattern>
    </include_patterns>
    <exclude_patterns>
      <pattern>*_test.rs</pattern>
      <pattern>old_*</pattern>
    </exclude_patterns>
    <include_directories>
      <directory>src</directory>
      <directory>docs</directory>
    </include_directories>
```

## 2.1 Extraction Flow & Precedence

- Download via reqwest::get().
- 2. Iterate over every entry in the ZIP.
- 3. Skip if file.is\_dir() .
- 4. Exclude checks (highest priority):
  - If exclude\_files contains the filename → drop.
  - $\bullet$  If any exclude\_patterns match the filename or path  $\rightarrow$  drop.
  - $\bullet$  If <code>exclude\_directories</code> contains any parent directory in the file's path  $\rightarrow$  drop.
- 5. Include checks (only if enabled):
  - $\bullet$  If <code>include\_files</code> is non-empty  $\rightarrow$  file must appear there.
  - If include\_patterns is non-empty → file must match at least one glob.
  - If include\_directories is non-empty → file must be within one of these directories.
- 6. Extract to the computed path, creating parents as needed.

## 2.2 Directory Filtering Details

Directory filtering uses exact path matching to prevent partial matches:

- Exact matching: "src" matches files in src/ but not src-backup/ or my-src/.
- Path normalization: Paths are normalized before comparison (e.g., src/ becomes src).
- Nested directories: A file at src/core/main.rs matches both "src" and "src/core" directory filters.

## Examples of directory matching:

File Path in ZIP	include_directories	exclude_directories	Result
src/main.rs	["src"]	[]	<pre>Include</pre>
src-backup/old.rs	["src"]	[]	<pre>Exclude</pre>
test/unit.rs	["src"]	["test"]	<pre>Exclude</pre>
docs/README.md	["src", "docs"]	[]	<pre>Include</pre>
examples/demo.rs	["src"]	["examples"]	<pre>Exclude</pre>

## 2.3 Field Reference

Field	Туре	Default	Example & Notes
url	string	required	https:///project-v1.zip

name	string	required	"Project v1.0 Release"
target_dir	string	"#"	"#/libs/project" → extracts into output/libs/project
include_files	[string]	[]	["README.md", "LICENSE"]
exclude_files	[string]	[]	["debug.log","secret.txt"]
include_patterns	[glob]	[]	["*.so","bin/*"]
exclude_patterns	[glob]	[]	["*_test.rs","old_*","docs/*.pdf"]
include_directories	[string]	[]	["src","docs","lib"] - exact directory path matching
exclude_directories	[string]	[]	["test","examples","bench"] - exact directory path matching
preserve_structure	boolean	false	<pre>true → keeps subfolders (src/foo.rs stays in src/, not flattened`)</pre>

# 3. file\_sources: One-Off File Downloads

Use file\_sources to pull single files (configs, scripts, binaries). Each entry now also requires a name for logging and identification.

#### YAML:

```
file_sources:
    url: "https://example.com/scripts/deploy.sh"
    name: "Deploy Script"
    target_path: "#/bin"
    rename_to: "qwik-deploy"
    url: "https://example.com/configs/app.yaml"
    name: "App Config"
    target_path: "#"
```

## JSON:

#### TOML:

```
[[file_sources]]
url = "https://example.com/scripts/deploy.sh"
name = "Deploy Script"
target_path = "#/bin"
rename_to = "qwik-deploy"

[[file_sources]]
url = "https://example.com/configs/app.yaml"
name = "App Config"
target_path = "#"
```

## XML:

Field	Туре	Default	Behavior
url	string	required	Full HTTP(S) URL to fetch.
name	string	required	Short identifier for logs and grouping (e.g. "App Config").
target_path	string	"#"	Template for directory or full path; # means "root".
rename_to	string?	none	If provided, replaces the filename portion after path substitution.

# 2. zip\_sources : Download & Extract ZIP Archives (with strip\_root\_folder )

```
Each entry in zip_sources follows this full schema (now including strip_root_folder):
```

## YAML:

```
zip_sources:
    - url: "https://example.com/archive.zip" # (required)
    name: "Example Archive" # (required)
```

```
target_dir: "#/data"
                                       # default "#"
   include_files: ["README.md"]
                                        # optional
   exclude_files: []
                                         # optional
   include_patterns: []
                                         # optional
   exclude_patterns: []
                                         # optional
   include_directories: []
                                        # optional
   exclude_directories: []
                                        # optional
   preserve_structure: true
                                         # default: false
   strip_root_folder: "archive-main"
                                       # optional; remove this top-level folder
when extracting
```

#### JSON:

```
{
    "zip_sources": [
      {
          "url": "https://example.com/archive.zip",
          "name": "Example Archive",
          "target_dir": "#/data",
          "preserve_structure": true,
          "strip_root_folder": "archive-main"
      }
    ]
}
```

## TOML:

```
[[zip_sources]]
url = "https://example.com/archive.zip"
name = "Example Archive"
target_dir = "#/data"
preserve_structure = true
strip_root_folder = "archive-main"
```

#### XML:

```
<zip_sources>
  <source>
    <url>https://example.com/archive.zip</url>
    <name>Example Archive</name>
    <target_dir>#/data</target_dir>
        cpreserve_structure>true</preserve_structure>
        <strip_root_folder>archive-main</strip_root_folder>
        </source>
</zip_sources>
```

Field	Туре	Default	Notes
url	string	required	Download link.
name	string	required	Identifier for logs (e.g. "Example Archive").
target_dir	string	"#"	Destination directory template.

include_files	[string]	[]	Exact filenames to whitelist.
exclude_files	[string]	[]	Exact filenames to blacklist.
include_patterns	[glob]	[]	Glob patterns to whitelist.
exclude_patterns	[glob]	[]	Glob patterns to blacklist.
include_directories	[string]	[]	Exact directory paths to whitelist.
exclude_directories	[string]	[]	Exact directory paths to blacklist.
preserve_structure	boolean	false	true preserves internal folder hierarchy, false flattens all files.
strip_root_folder	string?	none	Name of top-level folder to strip (e.g. GitHub repo-main). Optional.

# 4. Filtering Rules & Validation

# 4.1 Filter Precedence (Highest to Lowest)

- 1. Exclude filters (any match = exclude):
  - exclude\_files exact filename matches
  - exclude\_patterns glob pattern matches
  - exclude\_directories exact directory path matches
- 2. **Include filters** (all enabled filters must match):
  - include\_files if non-empty, filename must be listed
  - include\_patterns if non-empty, must match at least one pattern
  - $\circ$  include\_directories if non-empty, must be within listed directories

## 4.2 Configuration Validation

Stride validates configurations at startup to prevent conflicting rules:

## Invalid: Conflicting file rules

```
zip_sources:
    url: "https://example.com/archive.zip"
    name: "Invalid Example"
    include_files: ["README.md"]
    exclude_files: ["README.md"] # ERROR: Same file in both lists
```

## Invalid: Conflicting directory rules

```
zip_sources:
    - url: "https://example.com/archive.zip"
    name: "Invalid Example"
    include_directories: ["src"]
    exclude_directories: ["src"] # ERROR: Same directory in both lists
```

## Invalid: Conflicting nested directories

```
zip_sources:
    - url: "https://example.com/archive.zip"
    name: "Invalid Example"
    include_directories: ["src"]
    exclude_directories: ["src/test"] # ERROR: Nested conflict
```

## Valid: Non-conflicting rules

```
zip_sources:
    url: "https://example.com/archive.zip"
    name: "Valid Example"
    include_directories: ["src", "docs"]
    exclude_directories: ["test", "examples"]
    exclude_files: ["src/debug.log"] # OK: Specific file exclusion
```

## 4.3 Directory Matching Algorithm

```
// Pseudocode for directory matching
fn file_matches_directory_filter(file_path: &str, directories: &[String]) -> bool {
    let normalized_path = normalize_path(file_path);
    for dir in directories {
        let normalized_dir = normalize_path(dir);
        // Check if file is directly in this directory
        if normalized_path.starts_with(&format!("{}/", normalized_dir)) {
            return true;
        }
        // Check if file is in root and directory filter is for root
        if normalized_dir.is_empty() && !normalized_path.contains('/') {
            return true;
        }
    }
    false
}
```

## 5. Glob Patterns Deep Dive

Stride's simple glob rules operate on the **file name** (or full **relative path** when preserving structure):

Pattern	Matches	
*	everything	
*.ext	any name ending in .ext	
prefix*	any name starting with prefix	
*suffix	any name ending with suffix	

?	exactly one arbitrary character
docs/*	any file directly under docs/
<pre>docs/**/*.md (not supported)</pre>	recursive globs are <b>not</b> yet supported—only single-segment *.

# 6. Complete Multi-Format Example

Here's a realistic configuration with directory filtering shown in all four formats:

## **YAML Version**

```
# Node.js deployment with directory filtering
output_structure:
  "#/logs":
   description: "Runtime logs"
   create: true
  "#/temp":
   description: "Temp files"
   create: true
zip_sources:
  - url: "https://nodejs.org/dist/v18.14.0/node-v18.14.0-win-x64.zip"
   name: "NodeJS v18.14.0 Win64"
    target_dir: "#/bin"
   include_directories: ["bin", "lib"]
   exclude_directories: ["share/doc", "share/man"]
   include_patterns:
     - "*.exe"
      - "*.dll"
   exclude_patterns:
     - "nodevars.bat"
   preserve_structure: false
file_sources:
  - url: "https://example.com/app/config.json"
    target_path: "#/conf"
    rename_to: "app-config.json"
```

## **JSON Version**

```
"output_structure": {
    "#/logs": {
        "description": "Runtime logs",
        "create": true
    },
    "#/temp": {
        "description": "Temp files",
        "create": true
```

```
},
  "zip_sources": [
   {
      "url": "https://nodejs.org/dist/v18.14.0/node-v18.14.0-win-x64.zip",
      "name": "NodeJS v18.14.0 Win64",
      "target_dir": "#/bin",
      "include_directories": ["bin", "lib"],
      "exclude_directories": ["share/doc", "share/man"],
      "include_patterns": ["*.exe", "*.dll"],
      "exclude_patterns": ["nodevars.bat"],
      "preserve_structure": false
   }
  ],
  "file_sources": [
      "url": "https://example.com/app/config.json",
      "target_path": "#/conf",
      "rename_to": "app-config.json"
   }
  1
}
```

## **TOML Version**

```
# Node.js deployment with directory filtering
[output_structure."#/logs"]
description = "Runtime logs"
create = true
[output_structure."#/temp"]
description = "Temp files"
create = true
[[zip_sources]]
url = "https://nodejs.org/dist/v18.14.0/node-v18.14.0-win-x64.zip"
name = "NodeJS v18.14.0 Win64"
target_dir = "#/bin"
include_directories = ["bin", "lib"]
exclude_directories = ["share/doc", "share/man"]
include_patterns = ["*.exe", "*.dll"]
exclude_patterns = ["nodevars.bat"]
preserve_structure = false
[[file_sources]]
url = "https://example.com/app/config.json"
target_path = "#/conf"
rename_to = "app-config.json"
```

## **XML Version**

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- Node.js deployment with directory filtering -->
<root>
  <output_structure>
    <dir path="#/logs">
     <description>Runtime logs</description>
     <create>true</create>
   </dir>
    <dir path="#/temp">
      <description>Temp files</description>
      <create>true</create>
    </dir>
  </output_structure>
  <zip_sources>
    <source>
      <url>https://nodejs.org/dist/v18.14.0/node-v18.14.0-win-x64.zip</url>
     <name>NodeJS v18.14.0 Win64
     <target_dir>#/bin</target_dir>
     <include_directories>
       <directory>bin</directory>
       <directory>lib</directory>
     </include_directories>
     <exclude_directories>
       <directory>share/doc</directory>
       <directory>share/man</directory>
     </exclude_directories>
     <include_patterns>
       <pattern>*.exe</pattern>
       <pattern>*.dll</pattern>
      </include_patterns>
     <exclude_patterns>
        <pattern>nodevars.bat</pattern>
      </exclude_patterns>
      erve_structure>false</preserve_structure>
    </source>
  </zip_sources>
  <file_sources>
   <source>
     <url>https://example.com/app/config.json</url>
      <target_path>#/conf</target_path>
      <rename_to>app-config.json</rename_to>
    </source>
  </file_sources>
</root>
```

# 7. Validation & Troubleshooting

## Format-Specific Validation

• YAML: Use yamllint config.yaml to catch syntax issues.

- JSON: Use jsonlint config.json or any JSON validator.
- TOML: Use toml-validator config.toml or similar tools.
- XML: Use xmllint config.xml or any XML validator to check well-formedness.

#### **Common Issues**

- Serde errors: Stride will print which field/line was invalid.
- Empty extractions: Check your include\_\* vs. exclude\_\* overlap.
- **Directory conflicts**: Validation will catch conflicting include/exclude directory rules.
- Partial directory matches: Remember that directory filtering uses exact path matching.
- Format detection: Use --override-type-detection if auto-detection fails.
- XML escaping: Remember to escape & , < , > in XML content.
- Verbose logging: Stride prints each "Created directory" and "Extracted" line.

#### **Directory Filtering Debugging**

- Enable verbose logging to see which files are being filtered and why.
- $\hbox{\bf \cdot} \ \hbox{\bf Check directory path normalization} \ \hbox{\bf paths are normalized before matching.}$
- Verify exact matches "src" won't match "src-backup" or "my-src".
- Review nested rules ensure parent/child directory rules don't conflict.

# 8. Tips & Best Practices

#### Format Selection

- YAML: Best for human readability, comments, and complex configurations.
- JSON: Best for programmatic generation and web API integration.
- TOML: Best for simple, clear configurations with good readability.
- XML: Best for structured data exchange, validation with schemas, and integration with XML-based systems.

# **Directory Filtering Best Practices**

- Use exact paths: Specify complete directory names to avoid unintended matches.
- Test with verbose output: Use logging to verify filtering behavior.
- Avoid conflicts: Don't put the same directory in both include and exclude lists.
- Layer your filters: Combine directory filtering with file/pattern filtering for precision.
- **Document your intent**: Use clear directory names and add comments explaining the filtering logic.

## **General Tips**

- **Comments**: Use them liberally in YAML, TOML, and XML (JSON doesn't support comments).
- Validation: Always validate your config files before deployment.
- **Version pinning**: Include exact URLs with version numbers for reproducible builds.
- Testing: Use --override-type-detection to test the same config in different formats
- Migration: You can convert between formats using online converters or tools.
- XML namespaces: Not currently supported—keep XML simple and flat.

## 9. CLI Reference

## **Basic Usage**

```
# Auto-detect format
stride extract -c config.yaml
# Specify output directory
stride extract -c config.json -o build
# Override format detection
stride extract -c myconfig.txt --override-type-detection=toml
# Use XML format
stride extract -c config.xml
# Enable verbose logging for debugging filters
stride extract -c config.yaml -v
# Use an online config (note: x is an alias for extract)
stride x -c https://example.com/config.yaml
# Use an online config, autodetect type
stride x -c https://myconfig.tpglit.ch
# Use an online config, override detection
stride x -c https://myconfig.tpglit.ch --override-type-detection=toml
```

## Format Override Options

- yaml or yml Parse as YAML
- json Parse as JSON
- toml Parse as TOML
- xml Parse as XML
- Case insensitive: YAML , Json , Toml , XML all work

With this comprehensive guide, you can now craft **robust**, **readable**, and **precise** configuration files for Stride in any supported format—whether you're orchestrating a handful of file grabs or automating a multi-step, multi-ZIP build pipeline. The new directory filtering capabilities provide fine-grained control over which parts of ZIP archives get extracted, with built-in validation to prevent configuration conflicts. Happy brewing!