

readme.md for @push.rocks/smartsitemap

“ A comprehensive TypeScript sitemap library with a chainable builder API — supporting standard, news, image, video, and hreflang sitemaps with auto-splitting, streaming, validation, and RSS feed integration.

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Install

```
pnpm install @push.rocks/smartsitemap
```

Features

- **Chainable Builder API** — Fluent, composable API where every method returns `this`
- **News Sitemaps** — Google News-compatible with proper namespace handling
- **Image Sitemaps** — Full `image:image` extension support
- **Video Sitemaps** — Full `video:video` extension with all fields
- **hreflang / i18n** — `xhtml:link` alternate language annotations
- **Sitemap Index** — Automatic splitting at 50K URLs with index generation
- **Streaming** — Node.js Readable stream for million-URL sitemaps
- **Validation** — URL validation, size limits, spec compliance checks
- **Statistics** — URL counts, image/video/news counts, size estimates

- **☐ RSS/Atom Feed Import** — Convert feeds to sitemaps (unique feature!)
- **☐ YAML Config** — Declarative sitemap definition from YAML
- **☐ Multi-Format Output** — XML, TXT, JSON, gzipped buffer
- **☐ XSL Stylesheets** — Browser-viewable sitemaps
- **☐ Bidirectional Parsing** — Parse existing sitemaps back into structured data
- **☐ Full TypeScript** — Complete type safety with exported interfaces

Quick Start

```
import { SmartSitemap } from '@push.rocks/smartsitemap';

// 3 lines to a valid sitemap ☐☐
const xml = SmartSitemap.create()
  .addUrl('https://example.com/')
  .addUrl('https://example.com/about')
  .addUrl('https://example.com/blog')
  .toXml();
```

Output:

```
<?xml version="1.0" encoding="UTF-8"?>
<urlset xmlns="http://www.sitemaps.org/schemas/sitemap/0.9">
  <url>
    <loc>https://example.com/</loc>
  </url>
  <url>
    <loc>https://example.com/about</loc>
  </url>
  <url>
    <loc>https://example.com/blog</loc>
  </url>
</urlset>
```

Usage

☐☐ Standard Sitemap with Full Control

```

import { SmartSitemap } from '@push.rocks/smartsitemap';

const xml = SmartSitemap.create({ baseUrl: 'https://example.com' })
  .setDefaultChangeFreq('weekly')
  .setDefaultPriority(0.5)
  .setXslUrl('/sitemap.xml')
  .add({
    loc: 'https://example.com/',
    changefreq: 'daily',
    priority: 1.0,
    lastmod: new Date(),
  })
  .add({
    loc: 'https://example.com/products',
    changefreq: 'daily',
    priority: 0.9,
    images: [
      { loc: 'https://example.com/img/product1.jpg', title: 'Product 1' },
    ],
  })
  .add({
    loc: 'https://example.com/blog/post-1',
    lastmod: '2025-01-15',
    alternates: [
      { hreflang: 'de', href: 'https://example.com/de/blog/post-1' },
      { hreflang: 'fr', href: 'https://example.com/fr/blog/post-1' },
    ],
  })
  .toXml();

```

☐☐ Builder from a URL Array

```

const builder = SmartSitemap.fromUrls([
  'https://example.com/',
  'https://example.com/about',
  'https://example.com/contact',
]);

```

```
const xml = builder
  .setDefaultChangeFreq('monthly')
  .toXml();
```

📄 News Sitemap

```
const xml = SmartSitemap.createNews({
  publicationName: 'The Daily Tech',
  publicationLanguage: 'en',
})
.addNewsUrl(
  'https://example.com/news/breaking-story',
  'Breaking: TypeScript 6.0 Released!',
  new Date(),
  ['typescript', 'programming'],
)
.addNewsUrl(
  'https://example.com/news/another-story',
  'Node.js Gets Even Faster',
  new Date(),
)
.toXml();
```

📄 News Sitemap from RSS Feed

This is smartsitemap's killer feature — no other sitemap library does this:

```
// From a feed URL
const builder = SmartSitemap.createNews({
  publicationName: 'The Daily Tech',
  publicationLanguage: 'en',
});
await builder.importFromFeedUrl('https://thedailytech.com/rss/');
const xml = builder.toXml();

// Or as a one-liner with the static factory
const feedBuilder = await SmartSitemap.fromFeedUrl('https://example.com/rss/');
const feedXml = feedBuilder.toXml();
```

📄 News Sitemap from Articles

Works seamlessly with `@tsclass/tsclass` `IArticle` objects from your CMS:

```
import type { content } from '@tsclass/tsclass';

const articles: content.IArticle[] = [/* from your CMS or database */];

const xml = SmartSitemap.fromArticles(articles, {
  publicationName: 'My Publication',
  publicationLanguage: 'en',
}).toXml();
```

📄 Image Sitemap

```
const xml = SmartSitemap.create()
  .add({
    loc: 'https://example.com/gallery',
    images: [
      { loc: 'https://example.com/img/photo1.jpg', title: 'Sunset' },
      { loc: 'https://example.com/img/photo2.jpg', caption: 'Mountain view' },
    ],
  })
  .toXml();
```

📄 Video Sitemap

```
const xml = SmartSitemap.create()
  .add({
    loc: 'https://example.com/videos/tutorial',
    videos: [
      {
        thumbnailLoc: 'https://example.com/thumb.jpg',
        title: 'Getting Started with TypeScript',
        description: 'A comprehensive guide to TypeScript for beginners.',
        contentLoc: 'https://example.com/video.mp4',
        duration: 600,
      }
    ]
  })
  .toXml();
```

```
        rating: 4.8,
        publicationDate: new Date(),
        tags: ['typescript', 'tutorial', 'programming'],
    },
],
})
.toXml();
```

☐☐ hreflang / Internationalization

```
const xml = SmartSitemap.create()
    .add({
        loc: 'https://example.com/page',
        alternates: [
            { hreflang: 'en', href: 'https://example.com/page' },
            { hreflang: 'de', href: 'https://example.com/de/page' },
            { hreflang: 'fr', href: 'https://example.com/fr/page' },
            { hreflang: 'x-default', href: 'https://example.com/page' },
        ],
    })
    .toXml();
```

☐☐ Automatic Sitemap Index Splitting

When you exceed 50K URLs, smartsitemap automatically splits into a sitemap index:

```
const builder = SmartSitemap.create({
    baseUrl: 'https://example.com',
    maxUrlsPerSitemap: 45000, // default is 50000
});

// Add hundreds of thousands of URLs
for (const page of allPages) {
    builder.addUrl(page.url, page.lastModified);
}

const set = builder.toSitemapSet();
// set.needsIndex === true
```

```

// set.indexXml → '<?xml ...><sitemapindex>...'
// set.sitemaps → [
//   { filename: 'sitemap-1.xml', xml: '...' },
//   { filename: 'sitemap-2.xml', xml: '...' },
//   { filename: 'sitemap-3.xml', xml: '...' },
// ]

// Or build an index manually
const index = SmartSitemap.createIndex()
  .addSitemap('https://example.com/sitemap-blog.xml')
  .addSitemap('https://example.com/sitemap-products.xml', new Date())
  .toXml();

```

☐☐ Streaming for Large Sitemaps

For sitemaps with millions of URLs that can't fit in memory:

```

import { createWriteStream } from 'fs';
import { createGzip } from 'zlib';
import { SitemapStream } from '@push.rocks/smartsitemap';

const stream = new SitemapStream();
const output = createWriteStream('/var/www/sitemap.xml.gz');
stream.pipe(createGzip()).pipe(output);

// Stream URLs from a database cursor
for await (const page of databaseCursor()) {
  stream.pushUrl({
    loc: page.url,
    lastmod: page.updatedAt,
    changefreq: 'weekly',
  });
}

stream.finish();

```

☐☐ Merge, Dedupe, Filter & Sort

Combine multiple sitemap sources with powerful collection operations:

```
const blogSitemap = SmartSitemap.create()
  .setDefaultChangeFreq('weekly')
  .addFromArray(blogUrls);

const productSitemap = SmartSitemap.create()
  .setDefaultChangeFreq('daily')
  .addFromArray(productUrls);

const xml = SmartSitemap.create()
  .merge(blogSitemap)
  .merge(productSitemap)
  .dedupe()
  .filter(url => !url.loc.includes('/deprecated/'))
  .sort((a, b) => a.loc.localeCompare(b.loc))
  .toXml();
```

☐☐ YAML Configuration

Define sitemaps declaratively:

```
const yaml = `
baseUrl: https://example.com
defaults:
  priority: 0.5
urls:
  daily:
    - /
    - /blog
  weekly:
    - /docs
    - /tutorials
  monthly:
    - /about
    - /contact
  yearly:
    - /privacy
    - /terms
```

```
`;  
  
const builder = await SmartSitemap.fromYaml(yaml);  
const xml = builder.toXml();
```

□ Validation

Catch errors before they reach search engines:

```
const result = SmartSitemap.create()  
  .addUrl('not-a-valid-url')  
  .add({ loc: 'https://example.com/', priority: 1.5 }) // out of range  
  .validate();  
  
console.log(result.valid); // false  
console.log(result.errors);  
// [  
//   { field: 'loc', message: 'Invalid URL: "not-a-valid-url"', url: 'not-a-valid-url' },  
//   { field: 'priority', message: 'Priority must be between 0.0 and 1.0', url:  
//     'https://example.com/' },  
// ]
```

□□ Statistics

Get insight into your sitemap:

```
const stats = SmartSitemap.create()  
  .addUrl('https://example.com/')  
  .add({ loc: 'https://example.com/gallery', images: [{ loc: '/img/1.jpg' }] })  
  .stats();  
  
console.log(stats);  
// {  
//   urlCount: 2,  
//   imageCount: 1,  
//   videoCount: 0,  
//   newsCount: 0,  
//   alternateCount: 0,
```

```
// estimatedSizeBytes: 750,  
// needsIndex: false,  
// }
```

☐☐ Multi-Format Output

```
const builder = SmartSitemap.create()  
  .addUrl('https://example.com/')  
  .addUrl('https://example.com/about');  
  
// XML (default)  
const xml = builder.toXml();  
  
// Plain text (one URL per line)  
const txt = builder.toTxt();  
// "https://example.com/\nhttps://example.com/about"  
  
// JSON  
const json = builder.toJson();  
  
// Gzipped XML buffer (for serving compressed)  
const gzipped = await builder.toGzipBuffer();
```

☐☐ Parse Existing Sitemaps

Read and parse sitemaps back into structured data:

```
// From URL  
const parsed = await SmartSitemap.parseUrl('https://example.com/sitemap.xml');  
console.log(parsed.type); // 'urlset' or 'sitemapindex'  
console.log(parsed.urls); // ISitemapUrl[]  
  
// From XML string  
const result = await SmartSitemap.parse(sitemapXmlString);  
  
// Parse and get a pre-populated builder for modification  
const builder = await SitemapParser.toBuilder(existingSitemapXml);
```

```
builder
  .addUrl('https://example.com/new-page')
  .filter(url => !url.loc.includes('/old/'))
  .toXml();

// Detect type without full parsing
SitemapParser.detectType('<urlset ...>'); // 'urlset'
SitemapParser.detectType('<sitemapindex ...>'); // 'sitemapindex'
```

☐☐ Real-World Integration Examples

Express.js / Hono / Fastify Server

```
import { SmartSitemap } from '@push.rocks/smartsitemap';

// Serve dynamic sitemap
app.get('/sitemap.xml', async (req, res) => {
  const xml = SmartSitemap.create()
    .setDefaultChangeFreq('weekly')
    .addFromArray(await getUrlsFromDatabase())
    .toXml();

  res.header('Content-Type', 'application/xml');
  res.send(xml);
});

// Serve news sitemap from RSS
app.get('/news-sitemap.xml', async (req, res) => {
  const builder = SmartSitemap.createNews({ publicationName: 'My Site' });
  await builder.importFromFeedUrl('https://mysite.com/rss/');

  res.header('Content-Type', 'application/xml');
  res.send(builder.toXml());
});
```

```
// Auto-split with sitemap index
app.get('/sitemap-index.xml', async (req, res) => {
  const builder = SmartSitemap.create({ baseUrl: 'https://mysite.com' });
  builder.addFromArray(await getAllUrls()); // 200K+ URLs

  const set = builder.toSitemapSet();
  res.header('Content-Type', 'application/xml');
  res.send(set.indexXml ?? set.sitemaps[0].xml);
});
```

Static Site Generator

```
import { SmartSitemap } from '@push.rocks/smartsitemap';
import { writeFileSync } from 'fs';

const xml = SmartSitemap.create()
  .setDefaultChangeFreq('weekly')
  .add({ loc: 'https://mysite.com/', changefreq: 'daily', priority: 1.0 })
  .add({ loc: 'https://mysite.com/about', changefreq: 'monthly' })
  .addFromArray(blogPostUrls)
  .dedupe()
  .toXml();

writeFileSync('./public/sitemap.xml', xml);
```

API Reference

SmartSitemap (Static Factories)

Method	Returns	Description
<code>SmartSitemap.create(options?)</code>	<code>UrlsetBuilder</code>	Create a standard sitemap builder
<code>SmartSitemap.createNews(options)</code>	<code>NewsSitemapBuilder</code>	Create a news sitemap builder
<code>SmartSitemap.createIndex(options?)</code>	<code>SitemapIndexBuilder</code>	Create a sitemap index builder

Method	Returns	Description
<code>SmartSitemap.fromUrls(urls, options?)</code>	<code>UrlsetBuilder</code>	Builder from URL string array
<code>SmartSitemap.fromYaml(yaml)</code>	<code>Promise<UrlsetBuilder></code>	Builder from YAML config
<code>SmartSitemap.fromFeedUrl(url, options?)</code>	<code>Promise<UrlsetBuilder></code>	Builder from RSS/Atom feed URL
<code>SmartSitemap.fromFeedString(xml, options?)</code>	<code>Promise<UrlsetBuilder></code>	Builder from RSS/Atom feed string
<code>SmartSitemap.fromArticles(articles, options)</code>	<code>NewsSitemapBuilder</code>	Builder from IArticle array
<code>SmartSitemap.parse(xml)</code>	<code>Promise<IParsedSitemap></code>	Parse sitemap XML string
<code>SmartSitemap.parseUrl(url)</code>	<code>Promise<IParsedSitemap></code>	Fetch and parse sitemap
<code>SmartSitemap.validate(xml)</code>	<code>Promise<IValidationResult></code>	Validate sitemap XML

UrlsetBuilder (Chainable)

Method	Returns	Description
<code>.add(url)</code>	<code>this</code>	Add a URL with full <code>ISitemapUrl</code> options
<code>.addUrl(loc, lastmod?)</code>	<code>this</code>	Add by URL string
<code>.addUrls(urls)</code>	<code>this</code>	Add multiple <code>ISitemapUrl</code> objects
<code>.addFromArray(locs)</code>	<code>this</code>	Add from plain string array
<code>.merge(other)</code>	<code>this</code>	Merge in another builder's URLs
<code>.filter(predicate)</code>	<code>this</code>	Filter URLs in-place
<code>.map(transform)</code>	<code>this</code>	Transform URLs in-place
<code>.sort(compareFn?)</code>	<code>this</code>	Sort URLs (default: alphabetical)
<code>.dedupe()</code>	<code>this</code>	Remove duplicate URLs by loc
<code>.setDefaultChangeFreq(freq)</code>	<code>this</code>	Set default changefreq
<code>.setDefaultPriority(priority)</code>	<code>this</code>	Set default priority (0.0-1.0)
<code>.setXslUrl(url)</code>	<code>this</code>	Set XSL stylesheet URL
<code>.importFromFeedUrl(url, options?)</code>	<code>Promise<this></code>	Import from RSS/Atom feed URL
<code>.importFromFeedString(xml, options?)</code>	<code>Promise<this></code>	Import from RSS/Atom feed string
<code>.importFromYaml(yaml)</code>	<code>Promise<this></code>	Import from YAML config
<code>.importFromArticles(articles)</code>	<code>this</code>	Import from IArticle array
<code>.toXml()</code>	<code>string</code>	Export as sitemap XML

Method	Returns	Description
<code>.toTxt()</code>	<code>string</code>	Export as plain text
<code>.toJson()</code>	<code>string</code>	Export as JSON
<code>.toGzipBuffer()</code>	<code>Promise<Buffer></code>	Export as gzipped XML
<code>.toSitemapSet()</code>	<code>ISitemapSet</code>	Auto-split with index
<code>.toStream()</code>	<code>SitemapStream</code>	Export as Node.js Readable stream
<code>.validate()</code>	<code>IValidationResult</code>	Validate against spec
<code>.stats()</code>	<code>ISitemapStats</code>	Get statistics
<code>.getUrls()</code>	<code>ISitemapUrl[]</code>	Get the raw URL array
<code>.count</code>	<code>number</code>	Get URL count

NewsSitemapBuilder (extends UrlsetBuilder)

Method	Returns	Description
<code>.addNewsUrl(loc, title, date, keywords?)</code>	<code>this</code>	Add a news article with publication info

SitemapIndexBuilder

Method	Returns	Description
<code>.add(entry)</code>	<code>this</code>	Add a sitemap index entry
<code>.addSitemap(loc, lastmod?)</code>	<code>this</code>	Add by URL string
<code>.addSitemaps(entries)</code>	<code>this</code>	Add multiple entries
<code>SitemapIndexBuilder.fromBuilder(builder, baseUrl)</code>	<code>{index, sitemaps[]}</code>	Auto-split a builder
<code>.toXml()</code>	<code>string</code>	Export as sitemap index XML
<code>.count</code>	<code>number</code>	Get entry count

SitemapStream

Method	Description
--------	-------------

<code>.pushUrl(url)</code>	Push a URL entry to the stream
<code>.finish()</code>	Signal end of stream, writes closing tag
<code>.count</code>	Number of URLs written

Key Types

```
interface ISitemapUrl {
    loc: string; // Required – absolute URL
    lastmod?: Date | string | number; // Date, ISO string, or timestamp (ms)
    changefreq?: TChangeFreq; //
    'always' | 'hourly' | 'daily' | 'weekly' | 'monthly' | 'yearly' | 'never'
    priority?: number; // 0.0 to 1.0
    images?: ISitemapImage[]; // Image extension
    videos?: ISitemapVideo[]; // Video extension
    news?: ISitemapNews; // News extension
    alternates?: ISitemapAlternate[]; // hreflang alternates
}

interface ISitemapOptions {
    baseUrl?: string;
    xslUrl?: string;
    defaultChangeFreq?: TChangeFreq;
    defaultPriority?: number;
    prettyPrint?: boolean; // default: true
    maxUrlsPerSitemap?: number; // default: 50000
    gzip?: boolean;
    validate?: boolean; // default: true
}

interface INewsSitemapOptions extends ISitemapOptions {
    publicationName: string; // Required
    publicationLanguage?: string; // default: 'en'
}
```

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