

# @push.rocks/smartsystem

A TypeScript library for interacting with the system it's running on, including environment, network, and hardware information.

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# readme.md for @push.rocks/smartsystem

Smart System Interaction for Node.js — your unified gateway to hardware, OS, environment, and network intelligence.

“ Zero-hassle system information and environment management for modern Node.js applications.

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## 📦 Features

`@push.rocks/smartsystem` consolidates system interaction into a single, elegant TypeScript-first API:

- 📦 **Unified System Interface** — One `Smartsystem` instance to rule them all
- 📦 **Runtime Detection** — Identify Node.js, Deno, Bun, or browser environments via [@push.rocks/smartenvironment](https://push.rocks/smartenvironment)
- 📦 **CPU Information** — Direct access to CPU core specs without the boilerplate
- 📦 **Network Intelligence** — Port scanning, speed tests, DNS resolution, traceroutes, and more via [@push.rocks/smartnetwork](https://push.rocks/smartnetwork)
- 📦 **Deep System Insights** — Comprehensive hardware, OS, Docker, and performance data via [systeminformation](https://push.rocks/systeminformation)
- ⚡ **TypeScript Native** — Built with TypeScript, for TypeScript (but works great with JS too!)

# ☐ Installation

```
# Using pnpm (recommended)
pnpm add @push.rocks/smartsystem

# Using npm
npm install @push.rocks/smartsystem
```

# ☐ Quick Start

```
import { Smartsystem } from '@push.rocks/smartsystem';

// Create your system interface
const mySystem = new Smartsystem();

// CPU cores at a glance
console.log(`Running on ${mySystem.cpus.length} CPU cores`);

// Deep system data
const osInfo = await mySystem.information.osInfo();
console.log(`OS: ${osInfo.distro} ${osInfo.release}`);
```

# ☐ API Overview

The `Smartsystem` class provides these powerful properties:

| Property             | Type                      | Description   |
|----------------------|---------------------------|---|
| <code>env</code>     | <code>Smartenv</code>     | Runtime environment detection — identify Node.js, Deno, Bun, browser, CI, and OS platform |
| <code>cpus</code>    | <code>os.CpuInfo[]</code> | Direct access to CPU core information (model, speed, times)                               |
| <code>network</code> | <code>SmartNetwork</code> | Network utilities — port scanning, speed tests, DNS, ping, traceroute                     |

| Property    | Type              | Description   |
|-------------|-------------------|---|
| information | systeminformation | Full access to 50+ system data functions (CPU, memory, disk, GPU, Docker, etc.) |

## Usage Examples

### Runtime Environment Detection

Detect where your code is running and adapt accordingly:

```
const mySystem = new Smartsystem();

// Runtime identification
console.log(`Runtime: ${mySystem.env.runtimeEnv}`); // 'node', 'deno', 'bun', or 'browser'
console.log(`Is Node.js: ${mySystem.env.isNode}`);
console.log(`Is CI: ${mySystem.env.isCI}`);

// OS detection
if (await mySystem.env.isLinuxAsync()) {
  console.log('Running on Linux');
} else if (await mySystem.env.isMacAsync()) {
  console.log('Running on macOS');
}

// Conditionally load modules based on runtime
const fsModule = await mySystem.env.getSafeModuleFor<typeof import('fs')>('node', 'fs');
```

### CPU Information at Your Fingertips

```
const mySystem = new Smartsystem();

console.log(`CPU Cores: ${mySystem.cpus.length}`);
console.log(`Primary CPU: ${mySystem.cpus[0].model}`);
console.log(`Speed: ${mySystem.cpus[0].speed} MHz`);
```

# 📡 Network Intelligence

Leverage the full power of `SmartNetwork`:

```
const mySystem = new Smartsystem();

// Check if a local port is available
const portFree = await mySystem.network.isLocalPortUnused(3000);
console.log(`Port 3000 available: ${portFree}`);

// Find a free port in a range
const freePort = await mySystem.network.findFreePort(8000, 9000);
console.log(`Free port found: ${freePort}`);

// Check remote port availability
const isReachable = await mySystem.network.isRemotePortAvailable('example.com', { port: 443
});
console.log(`Remote HTTPS reachable: ${isReachable}`);

// DNS resolution
const dns = await mySystem.network.resolveDns('example.com');
console.log(`A records: ${dns.A.join(', ')}`);

// Ping a host
const pingResult = await mySystem.network.ping('8.8.8.8', { count: 3 });

// Get public IP addresses
const publicIps = await mySystem.network.getPublicIps();
console.log(`Public IPv4: ${publicIps.v4}`);

// Run a speed test
const speed = await mySystem.network.getSpeed();
console.log(`Download: ${speed.downloadSpeed} | Upload: ${speed.uploadSpeed}`);

// HTTP endpoint health check
const health = await mySystem.network.checkEndpoint('https://example.com');
console.log(`Status: ${health.status}, RTT: ${health.rtt}ms`);

// Traceroute
```

```
const hops = await mySystem.network.traceroute('example.com', { maxHops: 15 });
hops.forEach(hop => console.log(`TTL ${hop.ttl}: ${hop.ip} (${hop.rtt}ms)`));
```

## 📖 Deep System Insights

Access detailed system information via `systeminformation`:

```
const mySystem = new Smartsystem();

// Hardware information
const systemInfo = await mySystem.information.system();
console.log(`System: ${systemInfo.manufacturer} ${systemInfo.model}`);

// Operating system details
const osInfo = await mySystem.information.osInfo();
console.log(`OS: ${osInfo.distro} ${osInfo.release}`);

// Real-time CPU metrics
const load = await mySystem.information.currentLoad();
console.log(`CPU Load: ${load.currentLoad.toFixed(2)}%`);

// Memory usage
const mem = await mySystem.information.mem();
console.log(`Memory: ${(mem.used / mem.total * 100).toFixed(2)}% used`);

// Disk information
const disk = await mySystem.information.fsSize();
disk.forEach(fs => console.log(`${fs.mount}: ${fs.use.toFixed(1)}% used`));

// GPU details
const gpu = await mySystem.information.graphics();
gpu.controllers.forEach(c => console.log(`GPU: ${c.model} (${c.vram}MB VRAM)`));

// Network interfaces
const defaultIface = await mySystem.information.networkInterfaceDefault();
console.log(`Default network interface: ${defaultIface}`);
```

# ☐☐ Real-World Use Cases

## System Health Monitoring

Build a health check endpoint for your application:

```
const mySystem = new Smartsystem();

async function healthCheck() {
  const load = await mySystem.information.currentLoad();
  const mem = await mySystem.information.mem();
  const disk = await mySystem.information.fsSize();

  return {
    status: 'healthy',
    metrics: {
      cpuLoad: `${load.currentLoad.toFixed(2)}%`,
      memoryUsage: `${(mem.used / mem.total * 100).toFixed(2)}%`,
      diskUsage: disk.map(fs => ({
        mount: fs.mount,
        usage: `${fs.use.toFixed(2)}%`
      })))
    }
  };
}
```

## Network Traffic Monitoring

Track bandwidth in real time:

```
const mySystem = new Smartsystem();

async function monitorNetwork() {
  const defaultInterface = await mySystem.information.networkInterfaceDefault();
  await mySystem.information.networkStats(defaultInterface); // baseline

  await new Promise(resolve => setTimeout(resolve, 1000));
}
```

```
const current = await mySystem.information.networkStats(defaultInterface);
const rxSpeed = (current[0].rx_sec / 1024 / 1024).toFixed(2);
const txSpeed = (current[0].tx_sec / 1024 / 1024).toFixed(2);

console.log(`Download: ${rxSpeed} MB/s | Upload: ${txSpeed} MB/s`);
}
```

## Smart Resource Scaling

Dynamically scale workers based on available resources:

```
const mySystem = new Smartsystem();

async function getOptimalWorkerCount() {
  const cpuCount = mySystem.cpus.length;
  const load = await mySystem.information.currentLoad();
  const mem = await mySystem.information.mem();

  const memoryConstraint = Math.floor(mem.available / (512 * 1024 * 1024)); // 512MB per
worker
  const cpuConstraint = Math.max(1, Math.floor(cpuCount * (1 - load.currentLoad / 100)));

  return Math.min(memoryConstraint, cpuConstraint, cpuCount);
}
```

## 🐳 Docker & Container Awareness

Inspect Docker state from within your app:

```
const mySystem = new Smartsystem();

const dockerInfo = await mySystem.information.dockerInfo();
console.log(`Docker containers: ${dockerInfo.containers} (${dockerInfo.containersRunning}
running)`);

const containers = await mySystem.information.dockerContainers();
containers.forEach(c => console.log(` ${c.name}: ${c.state}`));
```

# Cross-Platform Logic

Write platform-aware code cleanly:

```
const mySystem = new Smartsystem();

if (await mySystem.env.isLinuxAsync()) {
  // Linux-specific setup
} else if (await mySystem.env.isMacAsync()) {
  // macOS-specific setup
} else if (await mySystem.env.isWindowsAsync()) {
  // Windows-specific setup
}
```

## ☐ TypeScript Support

Full TypeScript support with comprehensive type definitions:

```
import { Smartsystem } from '@push.rocks/smartsystem';
import type { Systeminformation } from 'systeminformation';

const mySystem = new Smartsystem();

// All methods are fully typed
const cpuInfo: Systeminformation.CpuData = await mySystem.information.cpu();
const memInfo: Systeminformation.MemData = await mySystem.information.mem();
```

## ☐ API Documentation

For complete API documentation, visit: <https://code.foss.global/push.rocks/smartsystem>

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# changelog.md for @push.rocks/smartsystem

## 2026-02-13 - 3.0.8 - fix(deps)

bump dependencies, adjust build script and npmextra publish config, and refresh documentation

- Bumped runtime deps: @push.rocks/lik ^6.0.0 -> ^6.2.2, @push.rocks/smartenvironment ^5.0.2 -> ^6.0.0, @push.rocks/smartnetwork ^3.0.0 -> ^4.4.0, @push.rocks/smartpromise ^4.0.2 -> ^4.2.3, systeminformation ^5.12.1 -> ^5.30.7
- Updated devDependencies: @git.zone/tsbuild ^2.1.63 -> ^4.1.2, @git.zone/tsrun ^1.3.3 -> ^2.0.1, @git.zone/tstest ^1.0.72 -> ^3.1.8; removed tslint and tslint-config-prettier
- Changed build script to remove --allowimplicitany ("build": "(tsbuild tsfolders)")
- Updated npmextra.json: migrated keys to scoped entries (@git.zone/cli, @git.zone/tsdoc, @ship.zone/szci), added release registries (verdaccio + npm) and accessLevel
- Documentation updates: expanded readme.md with examples, runtime detection, network and system usage, legal/licensing clarifications; added readme.hints.md

## 2025-08-29 - 3.0.7 - fix(build)

Switch build script to run tsbuild on tsfolders instead of using the --web flag

- Updated package.json scripts.build from "(tsbuild --web --allowimplicitany)" to "(tsbuild tsfolders --allowimplicitany)"
- This is a build-script change only; no source API changes were made

## 2025-08-29 - 3.0.6 - fix(smartsystem)

Add typings entry and normalize package description; sync commitinfo

- Add "typings": "dist\_ts/index.d.ts" to package.json to expose TypeScript declaration file.
- Normalize package description wording (replace contraction "it's" with "it is") for consistency and clarity.
- Update ts/00\_commitinfo\_data.ts description to match the package.json description.

## 2025-08-29 - 3.0.5 - fix(metadata)

Clarify package/module description by expanding contraction

- Replaced "it's" with "it is" in the package/module description to improve clarity (files updated: npmextra.json, ts/00\_commitinfo\_data.ts).
- Documentation/metadata-only change; no runtime or API changes.
- Bump patch version to 3.0.5.

## 2025-08-29 - 3.0.4 - fix(smartsystem)

Bump version to 3.0.4

- Patch release: increment package version to 3.0.4
- No functional code changes detected in source files
- Tests are present but contain placeholder implementations
- Dependencies are pinned as wildcard '\*' and were not updated

## 2025-08-29 - 3.0.3 - fix(readme)

Update README: expand documentation, add installation, usage examples, API overview, and advanced guides

- Completely revamped README with a clearer project description and features list
- Added Installation section with npm / pnpm / yarn examples
- Added Quick Start, API overview, and multiple usage examples (env, CPU, network, systeminformation)
- Added Real-World Use Cases (health check, network monitoring, resource scaling) and Advanced Features (cross-platform, Docker detection)
- Clarified TypeScript support and added links to full API documentation
- Documentation-only changes; no code or API behaviour modified

# 2025-08-29 - 3.0.2 - fix(smartsystem)

Normalize package scopes, update dev dependencies and tooling, add pnpm workspace and packageManager, remove GitLab CI, and update imports/docs/tests

- Normalize package scope names from @pushrocks/\* to @push.rocks/\* across source, commit info and README
- Update dependency versions: bump @push.rocks/smartpromise to ^4.0.2 and ensure other @push.rocks packages use caret ranges
- Switch dev tooling namespaces to @git.zone (tsbuild/tsrun/tstest) and add @git.zone/tsrun
- Enhance npm scripts: make test run with verbose, logfile and increased timeout
- Add packageManager field (pnpm@10.14.0+sha512...) to package.json and add pnpm-workspace.yaml with onlyBuiltDependencies: [esbuild]
- Remove legacy .gitlab-ci.yml CI configuration
- Update imports in ts and test files to match new package namespaces

# 2024-05-29 - 3.0.1 - chore

Update of package metadata and TypeScript configuration.

- update description
- update tsconfig (adjustments to TypeScript config)
- update npmextra.json: githost (fixes to githost entries)

# 2022-07-28 - 3.0.0 - fix(core)

Minor core fixes and release of 3.0.0.

- fix(core): update

# 2022-07-28 - 2.0.10 - BREAKING (core)

Breaking change: module format switched to ESM.

- BREAKING CHANGE(core): switch to esm
- misc maintenance and fixes leading up to this release

## 2017-07-31 - 2.0.1..2.0.9 - maintenance

Series of patch releases with small fixes and upkeep across the 2.0.x line.

- Multiple patch releases (2.0.1 → 2.0.9) containing repeated core fixes
- Updates to README and repository metadata
- update yarn lock (notably in 2.0.1)

## 2017-07-31 - 1.0.0..1.0.18 - initial development & improvements

Initial development, feature additions and documentation improvements across 1.0.x.

- initial releases and basic module structure; first working version
- add npm as default module loader (1.0.6)
- improve path resolution and add keywords (1.0.4-1.0.5)
- add docs, improve README and tests across multiple 1.0.x releases
- CI updates and general streamlining of the project