

# @push.rocks/smarts tate

A package for handling and managing state in applications.

- [readme.md for @push.rocks/smartstate](#)
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# readme.md for @push.rocks/smartstate

A TypeScript-first reactive state management library with processes, middleware, computed state, batching, persistence, and Web Component Context Protocol support ☐

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## Install

```
pnpm install @push.rocks/smartstate --save
```

Or with npm:

```
npm install @push.rocks/smartstate --save
```

## Usage

## Quick Start

```
import { Smartstate } from '@push.rocks/smartstate';  
  
// 1. Define your state part names  
type AppParts = 'user' | 'settings';
```

```

// 2. Create the root instance
const state = new Smartstate<AppParts>();

// 3. Create state parts with initial values
const userState = await state.getStatePart<{ name: string; loggedIn: boolean }>('user', {
  name: '',
  loggedIn: false,
});

// 4. Subscribe to changes
userState.select((s) => s.name).subscribe((name) => {
  console.log('Name changed:', name);
});

// 5. Update state
await userState.setState({ name: 'Alice', loggedIn: true });

```

## ☐☐ State Parts & Init Modes

State parts are isolated, typed units of state — the building blocks of your application's state tree. Create them via `getStatePart()`:

```
const part = await state.getStatePart<IMyState>(name, initialState, initMode);
```

Init Mode	Behavior
<code>'soft'</code> (default)	Returns existing if found, creates new otherwise
<code>'mandatory'</code>	Throws if state part already exists — useful for ensuring single-initialization
<code>'force'</code>	Always creates a new state part, disposing and overwriting any existing one
<code>'persistent'</code>	Like <code>'soft'</code> but automatically persists state to IndexedDB via WebStore

You can use either string literal union types or enums for state part names:

```

// String literal types (simpler)
type AppParts = 'user' | 'settings' | 'cart';

```

```
// Enums (more explicit)
enum AppParts {
  User = 'user',
  Settings = 'settings',
  Cart = 'cart',
}
```

## ☐ Persistent State

```
const settings = await state.getStatePart('settings', { theme: 'dark', fontSize: 14 },
'persistent');

// ☐ Automatically saved to IndexedDB on every setState()
// ☐ On next app load, persisted values override defaults
// ☐ Persistence writes complete before in-memory updates
```

## ☐ Selecting State

`select()` returns an RxJS Observable that emits the current value immediately (via `BehaviorSubject`) and on every subsequent change:

```
// Full state
userState.select().subscribe((state) => console.log(state));

// Derived value via selector function
userState.select((s) => s.name).subscribe((name) => console.log(name));
```

Selectors are **memoized** — calling `select(fn)` with the same function reference returns the same cached Observable, shared across all subscribers via `shareReplay`. This means you can call `select(mySelector)` in multiple places without creating duplicate subscriptions.

**Change detection** is built in: `select()` uses `distinctUntilChanged` with deep JSON comparison, so subscribers only fire when the selected value actually changes. Selecting `s => s.name` won't re-emit when only `s.count` changes.

## ⌘ AbortSignal Support

Clean up subscriptions without manual `.unsubscribe()` — the modern way:

```
const controller = new AbortController();

userState.select((s) => s.name, { signal: controller.signal }).subscribe((name) => {
  console.log(name); // automatically stops receiving when aborted
});

// Later: clean up all subscriptions tied to this signal
controller.abort();
```

## ⚡ Actions

Actions provide controlled, named state mutations with full async support:

```
interface ILoginPayload {
  username: string;
  email: string;
}

const loginAction = userState.createAction<ILoginPayload>(async (statePart, payload) => {
  const current = statePart.getState();
  return { ...current, name: payload.username, loggedIn: true };
});

// Two equivalent ways to dispatch:
await loginAction.trigger({ username: 'Alice', email: 'alice@example.com' });
// or
await userState.dispatchAction(loginAction, { username: 'Alice', email: 'alice@example.com'
});
```

Both `trigger()` and `dispatchAction()` return a Promise with the new state. All dispatches are serialized through a mutation queue, so concurrent dispatches never cause lost updates.

## 📦 Nested Actions (Action Context)

When you need to dispatch sub-actions from within an action, use the `context` parameter. This is critical because calling `dispatchAction()` directly from inside an action would deadlock (it tries to acquire the mutation queue that's already held). The context's `dispatch()` bypasses the queue and executes inline:

```

const incrementAction = userState.createAction<number>(async (statePart, amount) => {
  const current = statePart.getState();
  return { ...current, count: current.count + amount };
});

const doubleIncrementAction = userState.createAction<number>(async (statePart, amount,
context) => {
  // ❌ Safe: uses context.dispatch() which bypasses the mutation queue
  await context.dispatch(incrementAction, amount);
  const current = statePart.getState();
  return { ...current, count: current.count + amount };
});

// ❌ DON'T do this inside an action – it will deadlock:
// await statePart.dispatchAction(someAction, payload);

```

A built-in depth limit (10 levels) prevents infinite circular dispatch chains, throwing a clear error if exceeded.

## ☐☐ Processes (Polling, Streams & Scheduled Tasks)

Processes are managed, pausable observable-to-state bridges — the "side effects" layer. They tie an ongoing data source (polling, WebSockets, event streams) to state updates with full lifecycle control and optional auto-pause.

### Basic Process: Polling an API

```

import { interval, switchMap, from } from 'rxjs';

const metricsPoller = dashboard.createProcess<{ cpu: number; memory: number }>({
  // Producer: an Observable factory – called on start and each resume
  producer: () => interval(5000).pipe(
    switchMap(() => from(fetch('/api/metrics').then(r => r.json()))),
  ),
  // Reducer: folds each produced value into state (runs through middleware & validation)
  reducer: (currentState, metrics) => ({
    ...currentState,
    metrics,
  })
});

```

```

    lastUpdated: Date.now(),
  }),
  autoPause: 'visibility', // ☐ Stop polling when the tab is hidden
  autoStart: true,        // ▶ Start immediately
});

// Full lifecycle control
metricsPoller.pause(); // Unsubscribes from producer
metricsPoller.resume(); // Re-subscribes (fresh subscription)
metricsPoller.dispose(); // Permanent cleanup

// Observe status reactively
metricsPoller.status; // 'idle' | 'running' | 'paused' | 'disposed'
metricsPoller.status$.subscribe(s => console.log('Process:', s));

```

## Scheduled Actions

Dispatch an existing action on a recurring interval — syntactic sugar over `createProcess`:

```

const refreshAction = dashboard.createAction<void>(async (sp) => {
  const data = await fetch('/api/dashboard').then(r => r.json());
  return { ...sp.getState()!, ...data, lastUpdated: Date.now() };
});

// Dispatches refreshAction every 30 seconds, auto-pauses when tab is hidden
const scheduled = dashboard.createScheduledAction({
  action: refreshAction,
  payload: undefined,
  intervalMs: 30000,
  autoPause: 'visibility',
});

// It's a full StateProcess – pause, resume, dispose all work
scheduled.dispose();

```

## Custom Auto-Pause Signals

Pass any `Observable<boolean>` as the auto-pause signal — `true` means active, `false` means pause:

```

import { fromEvent, map, startWith } from 'rxjs';

// Pause when offline, resume when online
const onlineSignal = fromEvent(window, 'online').pipe(
  startWith(null),
  map(() => navigator.onLine),
);

const syncProcess = userPart.createProcess<SyncPayload>({
  producer: () => interval(10000).pipe(
    switchMap(() => from(syncWithServer())),
  ),
  reducer: (state, result) => ({ ...state, ...result }),
  autoPause: onlineSignal,
});
syncProcess.start();

```

## WebSocket / Live Streams

Pause disconnects; resume creates a fresh connection:

```

const liveProcess = tickerPart.createProcess<TradeEvent>({
  producer: () => new Observable<TradeEvent>(subscriber => {
    const ws = new WebSocket('wss://trades.example.com');
    ws.onmessage = (e) => subscriber.next(JSON.parse(e.data));
    ws.onerror = (e) => subscriber.error(e);
    ws.onclose = () => subscriber.complete();
    return () => ws.close(); // Teardown: close WebSocket on unsubscribe
  }),
  reducer: (state, trade) => ({
    ...state,
    lastPrice: trade.price,
    trades: [...state.trades.slice(-99), trade],
  }),
  autoPause: 'visibility',
});
liveProcess.start();

```

## Error Recovery

If a producer errors, the process gracefully transitions to `'paused'` instead of dying. Call `resume()` to retry with a fresh subscription:

```
process.start();
// Producer errors → status becomes 'paused'
process.resume(); // Creates a fresh subscription – retry
```

## Process Cleanup Cascades

Disposing a `StatePart` or `Smartstate` instance automatically disposes all attached processes:

```
const p1 = part.createProcess({ ... });
const p2 = part.createProcess({ ... });
p1.start();
p2.start();

part.dispose();
console.log(p1.status); // 'disposed'
console.log(p2.status); // 'disposed'
```

## Middleware

Intercept every `setState()` call to transform, validate, log, or reject state changes:

```
// Logging middleware
userState.addMiddleware((newState, oldState) => {
  console.log('State changing:', oldState, '→', newState);
  return newState;
});

// Validation middleware – throw to reject the change
userState.addMiddleware((newState) => {
  if (!newState.name) throw new Error('Name is required');
  return newState;
});

// Transform middleware
userState.addMiddleware((newState) => {
  return { ...newState, name: newState.name.trim() };
});
```

```
// Async middleware
userState.addMiddleware(async (newState, oldState) => {
  await auditLog('state-change', { from: oldState, to: newState });
  return newState;
});

// Removal – addMiddleware() returns a dispose function
const remove = userState.addMiddleware(myMiddleware);
remove(); // middleware no longer runs
```

Middleware runs **sequentially** in insertion order. If any middleware throws, the state remains unchanged — the operation is **atomic**. Process-driven state updates go through middleware too.

## ☐☐ Computed / Derived State

Derive reactive values from one or more state parts using `combineLatest` under the hood:

```
import { computed } from '@push.rocks/smartstate';

const userState = await state.getStatePart('user', { firstName: 'Jane', lastName: 'Doe' });
const settingsState = await state.getStatePart('settings', { locale: 'en' });

// Standalone function
const greeting$ = computed(
  [userState, settingsState],
  (user, settings) => `Hello, ${user.firstName} (${settings.locale})`,
);

greeting$.subscribe((msg) => console.log(msg));
// => "Hello, Jane (en)"

// Also available as a convenience method on the Smartstate instance:
const greeting2$ = state.computed(
  [userState, settingsState],
  (user, settings) => `${user.firstName} - ${settings.locale}`,
);
```

Computed observables are **lazy** — they only subscribe to their sources when someone subscribes to them, and they automatically unsubscribe when all subscribers disconnect. They also use

`distinctUntilChanged` to avoid redundant emissions when the derived value hasn't actually changed.

## ☐ Batch Updates

Update multiple state parts at once while deferring all notifications until the entire batch completes:

```
const partA = await state.getStatePart('a', { value: 1 });
const partB = await state.getStatePart('b', { value: 2 });

await state.batch(async () => {
  await partA.setState({ value: 10 });
  await partB.setState({ value: 20 });
  // No notifications fire inside the batch
});
// Both subscribers now fire with their new values simultaneously

// Nested batches are supported – flush happens at the outermost level only
await state.batch(async () => {
  await partA.setState({ value: 100 });
  await state.batch(async () => {
    await partB.setState({ value: 200 });
  });
  // Still deferred – inner batch doesn't trigger flush
});
// Now both fire
```

## ☐ Waiting for State

Wait for a specific state condition to be met before proceeding:

```
// Wait for any truthy state
const currentState = await userState.waitForPresent();

// Wait for a specific condition
const name = await userState.waitForPresent((s) => s.name || undefined);

// With timeout (milliseconds)
```

```
const name = await userState.waitForValue((s) => s.name || undefined, 5000);

// With AbortSignal and/or timeout via options object
const controller = new AbortController();
try {
  const name = await userState.waitForValue(
    (s) => s.name || undefined,
    { timeoutMs: 5000, signal: controller.signal },
  );
} catch (e) {
  // e.message is 'Aborted' or 'waitForValue timed out after 5000ms'
}
```

## ☐☐ Context Protocol Bridge (Web Components)

Expose state parts to web components via the [W3C Context Protocol](#). This lets any web component framework (Lit, FAST, Stencil, or vanilla) consume your state without coupling:

```
import { attachContextProvider } from '@push.rocks/smartstate';

// Define a context key (use Symbol for uniqueness)
const themeContext = Symbol('theme');

// Attach a provider to a DOM element – any descendant can consume it
const cleanup = attachContextProvider(document.body, {
  context: themeContext,
  statePart: settingsState,
  selectorFn: (s) => s.theme, // optional: provide a derived value instead of full state
});

// A consumer dispatches a context-request event:
myComponent.dispatchEvent(
  new CustomEvent('context-request', {
    bubbles: true,
    composed: true,
    detail: {
      context: themeContext,
    }
  })
);
```

```

    callback: (theme) => console.log('Got theme:', theme),
    subscribe: true, // receive updates whenever the state changes
  },
}),
);

// Works seamlessly with Lit's @consume() decorator, FAST's context, etc.

// Cleanup when the provider is no longer needed
cleanup();

```

## □ State Validation

Built-in validation prevents `null` and `undefined` from being set as state. For custom validation, extend `StatePart`:

```

import { StatePart } from '@push.rocks/smartstate';

class ValidatedUserPart extends StatePart<string, IUserState> {
  protected validateState(stateArg: any): stateArg is IUserState {
    return (
      super.validateState(stateArg) &&
      typeof stateArg.name === 'string' &&
      typeof stateArg.loggedIn === 'boolean'
    );
  }
}

```

If validation fails, `setState()` throws and the state remains unchanged.

## ⚙ Async State Setup

Initialize state with async operations while ensuring actions wait for setup to complete:

```

await userState.stateSetup(async (statePart) => {
  const userData = await fetchUserFromAPI();
  return { ...statePart.getState(), ...userData };
});

```

```
// Any dispatchAction() calls will automatically wait for stateSetup() to finish
```

## ☐☐ Disposal & Cleanup

Both `Smartstate` and individual `StatePart` instances support disposal for proper cleanup:

```
// Dispose a single state part – completes the BehaviorSubject, clears middleware, caches,  
// and disposes all attached processes  
userState.dispose();  
  
// Dispose the entire Smartstate instance – disposes all state parts and clears internal maps  
state.dispose();
```

After disposal, `setState()` and `dispatchAction()` will throw if called on a disposed `StatePart`. Calling `start()`, `pause()`, or `resume()` on a disposed `StateProcess` also throws.

## ☐☐ Performance

Smartstate is built with performance in mind:

- ☐☐ **SHA256 Change Detection** — Uses content hashing to detect actual changes. Identical state values don't trigger notifications, even with different object references.
- ☐☐ **distinctUntilChanged on Selectors** — Sub-selectors only fire when the selected slice actually changes. `select(s => s.name)` won't emit when `s.count` changes.
- ☼ **Selector Memoization** — `select(fn)` caches observables by function reference and shares them via `shareReplay({ refCount: true })`. Multiple subscribers share one upstream subscription.
- ☐☐ **Cumulative Notifications** — `notifyChangeCumulative()` debounces rapid changes into a single notification at the end of the call stack.
- ☐☐ **Concurrent Safety** — Simultaneous `getStatePart()` calls for the same name return the same promise, preventing duplicate creation. All `setState()` and `dispatchAction()` calls are serialized through a mutation queue. Process values are serialized through their own internal queue.
- ☐☐ **Atomic Persistence** — WebStore writes complete before in-memory state updates, ensuring consistency.
- ☐☐ **Batch Deferred Notifications** — `batch()` suppresses all subscriber notifications until every update in the batch completes.

## API Reference

## Smartstate<T>

Method / Property	Description
<code>getStatePart(name, initial?, initMode?)</code>	Get or create a typed state part
<code>batch(fn)</code>	Batch state updates, defer all notifications until complete
<code>computed(sources, fn)</code>	Create a computed observable from multiple state parts
<code>dispose()</code>	Dispose all state parts and clear internal state
<code>isBatching</code>	<code>boolean</code> — whether a batch is currently active

## StatePart<TName, TPayload>

Method	Description
<code>getState()</code>	Get current state synchronously ( <code>TPayload</code>   <code>undefined</code> )
<code>setState(newState)</code>	Set state — runs middleware → validates → persists → notifies
<code>select(selectorFn?, options?)</code>	Observable of state or derived values. Options: <code>{ signal?: AbortSignal }</code>
<code>createAction(actionDef)</code>	Create a reusable, typed state action
<code>dispatchAction(action, payload)</code>	Dispatch an action and return the new state
<code>addMiddleware(fn)</code>	Add a middleware interceptor. Returns a removal function
<code>waitUntilPresent(selectorFn?, opts?)</code>	Wait for a state condition. Opts: <code>number</code> (timeout) or <code>{ timeoutMs?, signal? }</code>
<code>createProcess(options)</code>	Create a managed, pausable process tied to this state part
<code>createScheduledAction(options)</code>	Create a process that dispatches an action on a recurring interval
<code>notifyChange()</code>	Manually trigger a change notification (with hash dedup)
<code>notifyChangeCumulative()</code>	Debounced notification — fires at end of call stack
<code>stateSetup(fn)</code>	Async state initialization with action serialization
<code>dispose()</code>	Complete the BehaviorSubject, dispose processes, clear middleware and caches

## StateAction<TState, TPayload>

Method	Description
<code>trigger(payload)</code>	Dispatch the action on its associated state part

# StateProcess<TName, TPayload,

# TProducerValue>

Method / Property	Description
<code>start()</code>	Start the process (subscribes to producer, sets up auto-pause)
<code>pause()</code>	Pause the process (unsubscribes from producer)
<code>resume()</code>	Resume a paused process (fresh subscription to producer)
<code>dispose()</code>	Permanently stop the process and clean up
<code>status</code>	Current status: <code>'idle'   'running'   'paused'   'disposed'</code>
<code>status\$</code>	Observable of status transitions

# IActionContext<TState>

Method	Description
<code>dispatch(action, payload)</code>	Dispatch a sub-action inline (bypasses mutation queue). Available as the third argument to action definitions

## Standalone Functions

Function	Description
<code>computed(sources, fn)</code>	Create a computed observable from multiple state parts
<code>attachContextProvider(element, options)</code>	Bridge a state part to the W3C Context Protocol

## Exported Types

Type	Description
<code>TInitMode</code>	<code>'soft'   'mandatory'   'force'   'persistent'</code>
<code>TMiddleware&lt;TPayload&gt;</code>	<code>(newState, oldState) =&gt; TPayload   Promise&lt;TPayload&gt;</code>
<code>IActionDef&lt;TState, TPayload&gt;</code>	Action definition function signature (receives statePart, payload, context?)
<code>IActionContext&lt;TState&gt;</code>	Context for safe nested dispatch within actions
<code>IContextProviderOptions&lt;TPayload&gt;</code>	Options for <code>attachContextProvider</code>

Type	Description
<code>IProcessOptions&lt;TPayload, TValue&gt;</code>	Options for <code>createProcess</code> (producer, reducer, autoPause, autoStart)
<code>IScheduledActionOptions&lt;TPayload, TActionPayload&gt;</code>	Options for <code>createScheduledAction</code> (action, payload, intervalMs, autoPause)
<code>TProcessStatus</code>	<code>'idle'   'running'   'paused'   'disposed'</code>
<code>TAutoPause</code>	<code>'visibility'   Observable&lt;boolean&gt;   false</code>

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# changelog.md for @push.rocks/smartstate

## 2026-03-27 - 2.3.0 - feat(stateprocess)

add managed state processes with lifecycle controls, scheduled actions, and disposal safety

- introduces StateProcess with start, pause, resume, dispose, status, and auto-pause support
- adds createProcess() and createScheduledAction() on StatePart for polling, streams, and recurring actions
- adds disposal guards and Smartstate.dispose() to clean up state parts and attached processes
- improves selector and computed observables with distinct-until-changed behavior and skipped selector error emissions
- renames npmextra.json to .smartconfig.json and updates package tooling dependencies

## 2026-03-04 - 2.2.1 - fix(smartstate)

no changes detected; no version bump required

- Git diff shows no changes
- package.json version is 2.2.0
- No files modified — no release needed

## 2026-03-02 - 2.2.0 - feat(actions)

add action context for safe nested dispatch with depth limit to prevent deadlocks

- Introduce IActionContext to allow actions to dispatch sub-actions inline via context.dispatch
- Update IActionDef signature to accept an optional context parameter for backward compatibility
- Add StatePart.createActionContext and MAX\_NESTED\_DISPATCH\_DEPTH to track and limit nested dispatch depth (throws on circular dispatchs)
- Pass a created context into dispatchAction so actionDefs can safely perform nested dispatches without deadlocking the mutation queue
- Add tests covering re-entrancy, deeply nested dispatch, circular dispatch depth detection, backward compatibility with actions that omit context, and concurrent dispatch serialization

## 2026-02-28 - 2.1.1 - fix(core)

serialize state mutations, fix batch flushing/reentrancy, handle falsy initial values, dispose old StatePart on force, and improve notification/error handling

- Serialize setState() and dispatchAction() using an internal mutation queue to prevent lost updates and race conditions.
- Prevent batch flush deadlocks by introducing isFlushing and draining pending notifications iteratively.
- Force initMode now disposes the previous StatePart so the Subject completes and resources are cleaned up.
- Treat falsy but non-null values (0, false) as present: getStatePart accepts 0 as initial value and waitUntilPresent resolves for false/0.
- Improve notifyChange: use a stable snapshot, catch and log hash computation errors, and avoid duplicate notifications; notifyChangeCumulative now safely catches async errors.
- Add StatePart.dispose() to complete the Subject and clear pending timers/middlewares.
- Add/adjust tests for concurrent dispatches, concurrent setState, disposal behavior, falsy state handling, batch re-entrancy, force-mode disposal, and zero initialization.
- Documentation and README improvements (examples, clearer descriptions, persistence notes) and minor code cleanup (remove unused import).

## 2026-02-27 - 2.1.0 - feat(smartstate)

Add middleware, computed, batching, selector memoization, AbortSignal support, and Web Component Context Protocol provider

- Introduce StatePart middleware API (addMiddleware) — middleware runs sequentially before validation/persistence and can transform or reject a state change.
- Add computed derived observables: standalone computed(sources, fn) and Smartstate.computed to derive values from multiple state parts (lazy subscription).
- Add batching support via Smartstate.batch(fn), isBatching flag, and deferred notifications to batch multiple updates and flush only at the outermost level.
- Enhance select() with selector memoization (WeakMap cache and shareReplay) and optional AbortSignal support (auto-unsubscribe).
- Extend waitUntilPresent() to accept timeout and AbortSignal options and maintain backward-compatible numeric timeout argument.
- Add attachContextProvider(element, options) to bridge state parts to Web Component Context Protocol (context-request events) with subscribe/unsubscribe handling.
- Update StatePart.setState to run middleware, persist processed state atomically, and defer notifications to batching when applicable.
- Tests and README updated to document new features, behaviors, and examples.

## 2026-02-27 - 2.0.31 - fix(deps)

bump devDependencies and fix README license path

- Bump @git.zone/tsbundle from ^2.8.3 to ^2.9.0
- Bump @types/node from ^25.2.0 to ^25.3.2
- Update documented dependency set/version to v2.0.30 in readme.hints.md
- Fix README license file path from LICENSE to license in readme.md

## 2026-02-02 - 2.0.30 - fix(config)

update npmextra configuration and improve README: rename package keys, add release registry config, clarify waitUntilPresent timeout and notification/persistence behavior

- Renamed npmextra keys: 'gitzone' → '@git.zone/cli' and 'tsdoc' → '@git.zone/tsdoc'
- Added release configuration for @git.zone/cli including registries (verdaccio and npm) and accessLevel
- Removed top-level 'npmci' section
- Added new '@ship.zone/szci' entry with npmGlobalTools
- README: added waitUntilPresent timeout example with error handling
- README: clarified notifyChangeCumulative is debounced and documented persistence behavior (merge with defaults, atomic writes)
- README: documented concurrency/race-condition safety and timeout support for waitUntilPresent

# 2026-02-02 - 2.0.29 - fix(smartstate)

prevent duplicate statepart creation and fix persistence/notification race conditions

- Add pendingStatePartCreation map to deduplicate concurrent createStatePart calls
- Adjust init handling so 'force' falls through to creation and concurrent creations are serialized
- Merge persisted state with initial payload in 'persistent' initMode, with persisted values taking precedence
- Persist to WebStore before updating in-memory state to ensure atomicity
- Debounce cumulative notifications via pendingCumulativeNotification to avoid duplicate notifications
- Log selector errors instead of silently swallowing exceptions
- Add optional timeout to waitUntilPresent and ensure subscriptions and timeouts are cleaned up to avoid indefinite waits
- Await setState when performing chained state updates to ensure ordering and avoid race conditions

# 2026-02-02 - 2.0.28 - fix(deps)

bump devDependencies and dependencies, add tsbundle build config, update docs, and reorganize tests

- Bumped @git.zone/tsbuild to ^4.1.2, @git.zone/tsbundle to ^2.8.3, @git.zone/tsrun to ^2.0.1, @git.zone/tstest to ^3.1.8, and @types/node to ^25.2.0
- Upgraded @push.rocks/smartjson to ^6.0.0
- Added @git.zone/tsbundle bundle configuration to npmextra.json for building a dist bundle
- Removed pnpm-workspace.yaml entries (cleaned workspace constraints)
- Updated readme and readme.hints (docs formatting, version bumped to v2.0.28, issue reporting/security section and dependency list)
- Reorganized tests: removed \*.both.ts variants and added consolidated test files under test/ (test.ts, test.initialization.ts)

# 2025-09-12 - 2.0.27 - fix(StatePart)

Use stable JSON stringify for state hashing; update dependencies and tooling

- Replace `smartjson.stringify` with `smartjson.stableOneWayStringify` when creating SHA256 state hashes to ensure deterministic hashing and avoid duplicate notifications for semantically identical states.
- Bump runtime dependencies: `@push.rocks/smarthash -> ^3.2.6`, `@push.rocks/smartjson -> ^5.2.0`.
- Bump dev tooling versions: `@git.zone/tsbuild -> ^2.6.8`, `@git.zone/tsbundle -> ^2.5.1`, `@git.zone/tstest -> ^2.3.8`.
- Add local `.claude/settings.local.json` configuration for allowed permissions (local tooling/settings file).

## 2025-08-16 - 2.0.26 - fix(ci)

Add local Claude settings file to allow helper permissions for common local commands

- Added `.claude/settings.local.json` to grant local helper permissions for tooling
- Allowed commands: `Bash(tsx:)`, `Bash(tstest test:)`, `Bash(git add:)`, `Bash(git tag:)`
- No changes to source code or runtime behavior; tooling/config only

## 2025-07-29 - 2.0.25 - fix(core)

Major state initialization and validation improvements

- Fixed state hash bug: Now properly compares hash values instead of storing state objects
- Fixed state initialization merge order: Initial state now correctly takes precedence over stored state
- Improved type safety: `stateStore` properly typed as potentially undefined
- Simplified init mode logic with clear behavior for 'soft', 'mandatory', 'force', and 'persistent'
- Added state validation with extensible `validateState()` method
- Made `notifyChange()` async to support proper hash comparison
- Enhanced `select()` to filter undefined states automatically
- Added comprehensive test suite for state initialization scenarios
- Updated documentation with clearer examples and improved readme

## 2025-07-19 - 2.0.24 - fix(core)

Multiple fixes and improvements

- Fixed `StateAction` trigger method to properly return `Promise<TStateType>`

- Updated CI workflows to use new container registry and npmci package name
- Added pnpm workspace configuration for built-only dependencies

## 2025-07-19 - 2.0.23 - fix(ci)

Update CI workflows to use new container registry and npmci package name

- Changed CI image from 'registry.gitlab.com/hosttoday/ht-docker-node:npmci' to 'code.foss.global/host.today/ht-docker-node:npmci'
- Replaced npmci installation command from '@shipzone/npmci' to '@ship.zone/npmci' in workflow configurations

## 2025-07-19 - 2.0.22 - fix(smartsstate)

Fix StateAction trigger method to properly return Promise

- Fixed StateAction.trigger() to return Promise<TStateType> as expected
- Updated readme with improved documentation and examples
- Replaced outdated legal information with Task Venture Capital GmbH details
- Added implementation notes in readme.hints.md

## 2025-06-19 - 2.0.21 - maintenance

General updates and improvements

## 2025-06-19 - 2.0.20 - fix(smartsstate)

Update build scripts and dependency versions; replace isohash with smarthashWeb for state hash generation

- Adjusted package.json scripts to include verbose testing and modified build command

- Bumped development dependencies (tsbuild, tsbundle, tsrun, tstest, tapbundle) to newer versions
- Updated production dependencies (lik, smarthash, smartpromise, smartrx) with minor version bumps
- Replaced import of isohash with smarthashWeb in state hash generation, ensuring consistency across modules

## 2024-10-02 - 2.0.19 - fix(dependencies)

Update dependencies to latest versions

- Updated @git.zone/tsbuild to version ^2.1.84
- Updated @git.zone/tsbundle to version ^2.0.15
- Updated @git.zone/tsrun to version ^1.2.49
- Updated @git.zone/tstest to version ^1.0.90
- Updated @push.rocks/tapbundle to version ^5.3.0
- Updated @types/node to version ^22.7.4
- Updated @push.rocks/lik to version ^6.0.15
- Updated @push.rocks/smartjson to version ^5.0.20
- Updated @push.rocks/smartpromise to version ^4.0.4
- Updated @push.rocks/smartrx to version ^3.0.7
- Updated @push.rocks/webstore to version ^2.0.20

## 2024-10-02 - 2.0.18 - fix(core)

Fix type errors and typos in Smartstate class

- Updated type annotation in Smartstate class to ensure StatePartNameType extends string.
- Fixed a typo in the JSDoc comment: 'existing' instead of 'exiting'.
- Corrected improper type casting in the Smartstate class.

## 2024-05-29 - 2.0.17 - Maintenance

General updates and improvements.

- Updated project description
- Multiple updates to `tsconfig`
- Updated `npmextra.json` to include `ghost`

## 2023-10-07 - 2.0.16 - Maintenance

General updates and improvements.

- Core update

## 2023-10-04 - 2.0.15 - Maintenance

General updates and improvements.

- Core update

## 2023-10-03 - 2.0.14 to 2.0.10 - Maintenance

General updates and improvements.

- Core updates

## 2023-09-11 - 2.0.9 - Maintenance

General updates and improvements.

- Core update

## 2023-09-11 - 2.0.8 - Maintenance

General updates and improvements.

- Core update

## 2023-07-27 - 2.0.7 - Maintenance

General updates and improvements.

- Core update

## 2023-07-27 - 2.0.6 - Maintenance

General updates and improvements.

- Core update

## 2023-04-13 - 2.0.5 - Maintenance

General updates and improvements.

- Core update

## 2023-04-12 - 2.0.4 - Maintenance

General updates and improvements.

- Core update

## 2023-04-04 - 2.0.3 to 2.0.1 - Maintenance

General updates and improvements.

- Core updates

# 2023-03-15 - 2.0.0 - Major Update

Core update with significant changes.

# 2022-03-25 - 1.0.23 - Major Update

Breaking changes and major updates.

- SWITCH TO ESM

# 2022-01-24 - 1.0.22 - Maintenance

General updates and improvements.

- Core updates

# 2020-11-30 - 1.0.21 to 1.0.20 - Maintenance

General updates and improvements.

- Core updates

# 2020-11-30 - 1.0.19 to 1.0.18 - Maintenance

General updates and improvements.

- Core updates

# 2020-07-27 - 1.0.17 to 1.0.16 - Maintenance

General updates and improvements.

- Core updates

# 2020-05-27 - 1.0.15 - Maintenance

General updates and improvements.

- Core update

# 2020-05-27 - 1.0.14 - Maintenance

General updates and improvements.

- Core update

# 2019-09-25 - 1.0.13 - Maintenance

General updates and improvements.

- Core update

# 2019-09-25 - 1.0.12 - Maintenance

General updates and improvements.

- Core updates

# 2019-04-30 - 1.0.11 to 1.0.10 - Maintenance

General updates and improvements.

- Core updates

# 2019-03-22 - 1.0.9 - Maintenance

General updates and improvements.

- Core update

# 2019-02-27 - 1.0.8 - Minor Update

Minor updates and improvements.

- Updated action generation
- Core update

# 2019-02-21 - 1.0.7 - Initial Release

Initial release of the project.

- Initial core implementation