

@push.rocks/smart mail

A unified format for representing and dealing with emails, with support for attachments and email validation.

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

readme.md for @push.rocks/smartmail

A unified format for representing and dealing with emails, with support for attachments, email validation, dynamic templating, and wire format serialization for microservice communication.

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Install

```
pnpm add @push.rocks/smartmail
```

Features

- **Advanced Email Address Validation** - Validate email format, check for disposable/free domains, verify MX records, and detect role accounts
- **Rich Email Representation** - Create emails with multiple recipients (to/cc/bcc), attachments, HTML content, and custom headers
- **Template Support** - Use mustache templates for dynamic content in subject, body, and HTML
- **MIME Formatting** - Convert emails to standard MIME format compatible with nodemailer and other sending libraries
- **Caching & Performance** - Smart caching of DNS lookups for better performance
- **Creation Object Reference** - Associate arbitrary typed data with emails for tracking and context preservation
- **Fluent Chainable API** - All methods return `this` for elegant method chaining

- **Wire Format Serialization** - JSON serialization with base64 attachments for microservice communication
- **Wire Protocol Classes** - `WireTarget` and `WireParser` for client-server email service architecture

Usage

Importing the Module

```
import {
  Smartmail,
  EmailAddressValidator,
  WireTarget,
  WireParser,
  createMessageId,
  createTimestamp
} from '@push.rocks/smartmail';
```

Fluent Chainable API

All mutation methods return `this`, enabling elegant method chaining:

```
const response = await new Smartmail({
  from: 'sender@example.com',
  subject: 'Hello {{name}}',
  body: 'Welcome to our service!'
})
  .addRecipient('user@example.com')
  .addRecipient('manager@example.com', 'cc')
  .addRecipients(['team1@example.com', 'team2@example.com'], 'bcc')
  .setReplyTo('support@example.com')
  .setPriority('high')
  .addHeader('X-Campaign-ID', '12345')
  .applyVariables({ name: 'John' })
  .sendTo(wireTarget); // Send directly to a WireTarget
```

📧 Email Address Validation

Basic Email Validation

```
const emailValidator = new EmailAddressValidator();

const result = await emailValidator.validate('user@example.com');
console.log(result);
/*
{
  valid: true,           // Overall validity
  formatValid: true,    // Email format is valid
  localPartValid: true, // Local part (before @) is valid
  domainPartValid: true, // Domain part (after @) is valid
  mxValid: true,        // Domain has valid MX records
  disposable: false,    // Not a disposable email domain
  freemail: false,      // Not a free email provider
  reason: 'Email is valid'
}
*/
```

Advanced Validation Options

```
const validator = new EmailAddressValidator({
  skipOnlineDomainFetch: true, // Use only local domain list
  cacheDnsResults: true,      // Cache DNS lookups
  cacheExpiryMs: 7200000      // Cache expires after 2 hours
});

// Validate each part separately
const isValidFormat = validator.isValidEmailFormat('user@example.com');
const isValidLocalPart = validator.isValidLocalPart('user');
const isValidDomain = validator.isValidDomainPart('example.com');

// Check for disposable or free email providers
const result = await validator.validate('user@gmail.com');
```

```
if (result.freemail) {  
  console.log('This is a free email provider');  
}
```

Checking for Disposable Emails and Role Accounts

```
const validator = new EmailAddressValidator();  
  
// Check if an email is from a disposable domain  
const isDisposable = await validator.isDisposableEmail('user@tempmail.com');  
  
// Check if an email is a role account (info@, support@, admin@, etc.)  
const isRole = validator.isRoleAccount('support@example.com');  
  
// Get MX records for a domain  
const mxRecords = await validator.getMxRecords('example.com');  
// ['mx1.example.com', 'mx2.example.com']
```

☐ Creating and Using Smartmail Objects

Basic Email Creation

```
const email = new Smartmail({  
  from: 'sender@example.com',  
  to: ['recipient@example.com'],  
  subject: 'Hello from SmartMail',  
  body: 'This is a plain text email'  
});
```

Using Creation Object Reference

Associate any typed data with your email for tracking and context preservation:

```
interface OrderNotification {
  orderId: string;
  customerName: string;
  items: string[];
  total: number;
}

const orderEmail = new Smartmail<OrderNotification>({
  from: 'orders@example.com',
  to: ['customer@example.com'],
  subject: 'Your Order #{{orderId}} Confirmation',
  body: 'Thank you for your order, {{customerName}}!',
  creationObjectRef: {
    orderId: '12345',
    customerName: 'John Smith',
    items: ['Product A', 'Product B'],
    total: 99.95
  }
});

// Later, retrieve the original reference data
const orderData = orderEmail.getCreationObject();
console.log(`Processing email for order ${orderData.orderId}`);

// Use the reference data for templating
const subject = orderEmail.getSubject(orderData); // "Your Order #12345 Confirmation"
```

Template Variables in Subject and Body

```
const template = new Smartmail({
  from: 'notifications@example.com',
  subject: 'Welcome, {{name}}!',
  body: 'Hello {{name}},\n\nYour account ({{email}}) has been activated.',
  htmlBody: '<h1>Welcome, {{name}}!</h1><p>Your account (<strong>{{email}}</strong>) has been activated.</p>'
});
```

```
// Apply template variables when retrieving content
const subject = template.getSubject({ name: 'John Doe' });
const plainBody = template.getBody({ name: 'John Doe', email: 'john@example.com' });

// Or apply variables directly (modifies in place, chainable)
template.applyVariables({ name: 'John Doe', email: 'john@example.com' });
```

Adding Attachments

```
import { SmartFile } from '@push.rocks/smartfile';

const email = new Smartmail({
  from: 'sender@example.com',
  to: ['recipient@example.com'],
  subject: 'Report Attached',
  body: 'Please find the attached report.'
});

const report = await SmartFile.fromFilePath('/path/to/report.pdf');
const image = await SmartFile.fromFilePath('/path/to/image.png');

email
  .addAttachment(report)
  .addAttachment(image);
```

Converting to MIME Format

```
const email = new Smartmail({
  from: 'sender@example.com',
  to: ['recipient@example.com'],
  subject: 'Hello {{name}}',
  body: 'Text version: Hello {{name}}',
  htmlBody: '<p>HTML version: Hello <strong>{{name}}</strong></p>',
  validateEmails: true
});

const mimeObj = await email.toMimeFormat({ name: 'John' });
```

```
// Use with nodemailer or other email sending libraries
```

☐ Wire Format Serialization

Smartmail provides JSON serialization for transmitting emails between microservices. Attachments are automatically encoded as base64.

Serializing to JSON

```
const email = new Smartmail({
  from: 'sender@example.com',
  to: ['recipient@example.com'],
  subject: 'Wire Format Test',
  body: 'This email can be serialized!'
})

  .addAttachment(someFile)
  .setPriority('high');

// Serialize to JSON object
const jsonObject = email.toObject();

// Serialize to JSON string
const jsonString = email.toJson();
```

Deserializing from JSON

```
// From JSON object
const email1 = Smartmail.fromObject(jsonObject);

// From JSON string
const email2 = Smartmail.fromJson(jsonString);

// Attachments are automatically reconstructed from base64
console.log(email2.attachments[0].contentBuffer);
```

☐ Wire Protocol Classes

For microservice architectures, smartmail provides `WireTarget` and `WireParser` classes to handle client-server communication.

WireTarget (Client/SaaS Side)

The `WireTarget` is used by your SaaS application to communicate with an SMTP service:

```
import { WireTarget, Smartmail } from '@push.rocks/smartmail';

// Configure the target endpoint
const smtpTarget = new WireTarget({
  endpoint: 'https://smtp-service.example.com/api/wire',
  authToken: 'your-secret-token'
});

// Submit SMTP settings (extensible - add any custom settings)
await smtpTarget.updateSettings({
  smtp: {
    host: 'smtp.example.com',
    port: 587,
    secure: true,
    username: 'user',
    password: 'pass'
  },
  defaultFrom: 'noreply@example.com',
  customSetting: 'custom-value' // Extensible!
});

// Send an email using fluent API
const response = await new Smartmail({
  from: 'sender@example.com',
  subject: 'Hello {{name}}',
  body: 'Welcome!'
})
.addRecipient('user@example.com')
.setPriority('high')
```

```

.applyVariables({ name: 'John' })
.sendTo(smtpTarget);

console.log(`Sent! Delivery ID: ${response.deliveryId}`);

// Check delivery status
const status = await smtpTarget.getStatus(response.deliveryId);
console.log(`Status: ${status.status}`); // 'queued' | 'sending' | 'sent' | 'failed'

// List emails in a mailbox
const inbox = await smtpTarget.listMailbox('INBOX', { limit: 10, offset: 0 });
console.log(`Found ${inbox.total} emails`);

// Fetch a specific email
const fetchedEmail = await smtpTarget.fetchEmail('INBOX', 'email-id-123');

```

WireParser (Server/SMTP Side)

The `WireParser` is used by your SMTP service to handle incoming wire messages:

```

import { WireParser, createMessageId, createTimestamp } from '@push.rocks/smartmail';

const parser = new WireParser({
  // Handle email send requests
  async onMailSend(email, options) {
    const mimeFormat = await email.toMimeFormat();
    await transporter.sendMail(mimeFormat);

    return {
      type: 'mail.send.response',
      messageId: createMessageId(),
      timestamp: createTimestamp(),
      success: true,
      deliveryId: generateDeliveryId()
    };
  },

  // Handle settings updates
  async onSettingsUpdate(settings) {

```

```
if (settings.smtp) {
  configureSmtpTransport(settings.smtp);
}
// Handle custom settings
if (settings.customSetting) {
  handleCustomSetting(settings.customSetting);
}

return {
  type: 'settings.update.response',
  messageId: createMessageId(),
  timestamp: createTimestamp(),
  success: true
};
},

// Handle mailbox list requests
async onMailboxList(mailbox, options) {
  const emails = await getEmailsFromMailbox(mailbox, options);
  return {
    type: 'mailbox.list.response',
    messageId: createMessageId(),
    timestamp: createTimestamp(),
    mailbox,
    emails: emails.map(e => e.toObject()),
    total: emails.length
  };
},

// Handle email fetch requests
async onMailFetch(mailbox, emailId) {
  const email = await getEmailById(mailbox, emailId);
  return {
    type: 'mail.fetch.response',
    messageId: createMessageId(),
    timestamp: createTimestamp(),
    email: email ? email.toObject() : null
  };
},
```

```

// Handle status check requests
async onMailStatus(deliveryId) {
  const status = await getDeliveryStatus(deliveryId);
  return {
    type: 'mail.status.response',
    messageId: createMessageId(),
    timestamp: createTimestamp(),
    deliveryId,
    status: status.state
  };
}
});

// Express route handler example
app.post('/api/wire', async (req, res) => {
  const responseJson = await parser.parseAndHandle(JSON.stringify(req.body));
  res.json(JSON.parse(responseJson));
});

```

Wire Protocol Message Types

```

// All available message type interfaces
import type {
  IWireMessage,
  IMailSendRequest,
  IMailSendResponse,
  IMailboxListRequest,
  IMailboxListResponse,
  IMailFetchRequest,
  IMailFetchResponse,
  IMailStatusRequest,
  IMailStatusResponse,
  ISettingsUpdateRequest,
  ISettingsUpdateResponse,
  IWireSettings,
  ISmtpSettings,
  TWireMessage // Union type for type discrimination
}

```

```
} from '@push.rocks/smartmail';

// Helper functions
import { createMessageId, createTimestamp } from '@push.rocks/smartmail';
```

API Reference

EmailAddressValidator

Constructor Options

Option	Type	Default	Description
<code>skipOnlineDomainFetch</code>	boolean	<code>false</code>	Skip fetching domain list from online source
<code>cacheDnsResults</code>	boolean	<code>true</code>	Cache DNS lookup results
<code>cacheExpiryMs</code>	number	<code>3600000</code>	Cache expiry in milliseconds (1 hour)

Methods

Method	Returns	Description
<code>validate(email)</code>	<code>Promise<IEmailValidationResult></code>	Full validation with format, MX, and domain checks
<code>isValidEmailFormat(email)</code>	<code>boolean</code>	Check if email format is valid
<code>isValidLocalPart(localPart)</code>	<code>boolean</code>	Validate local part (before @)
<code>isValidDomainPart(domainPart)</code>	<code>boolean</code>	Validate domain part (after @)
<code>checkMxRecords(domain)</code>	<code>Promise<any></code>	Check MX records for a domain
<code>getMxRecords(domain)</code>	<code>Promise<string[]></code>	Get MX record hostnames for a domain
<code>isDisposableEmail(email)</code>	<code>Promise<boolean></code>	Check if email is from a disposable domain
<code>isRoleAccount(email)</code>	<code>boolean</code>	Check if email is a role account

Smartmail

Constructor Options

Option	Type	Default	Description
<code>from</code>	string	<i>required</i>	Email address of sender
<code>to</code>	string[]	<code>[]</code>	Array of primary recipient email addresses
<code>cc</code>	string[]	<code>[]</code>	Array of CC recipient email addresses
<code>bcc</code>	string[]	<code>[]</code>	Array of BCC recipient email addresses
<code>subject</code>	string	<i>required</i>	Email subject line (supports templates)
<code>body</code>	string	<i>required</i>	Plain text email body (supports templates)
<code>htmlBody</code>	string	<code>undefined</code>	HTML version of email body (supports templates)
<code>replyTo</code>	string	<code>undefined</code>	Reply-to email address
<code>headers</code>	Record<string, string>	<code>{}</code>	Custom email headers
<code>priority</code>	<code>'high' 'normal' 'low'</code>	<code>'normal'</code>	Email priority level
<code>validateEmails</code>	boolean	<code>false</code>	Validate all emails before MIME conversion
<code>creationObjectRef</code>	T	<code>undefined</code>	Reference data of any type (generic)

Methods (All chainable methods return `this`)

Method	Returns	Description
<code>addRecipient(email, type?)</code>	<code>this</code>	Add a single recipient (to/cc/bcc)
<code>addRecipients(emails, type?)</code>	<code>this</code>	Add multiple recipients
<code>setReplyTo(email)</code>	<code>this</code>	Set reply-to address
<code>setPriority(priority)</code>	<code>this</code>	Set email priority
<code>addHeader(name, value)</code>	<code>this</code>	Add custom header
<code>addAttachment(smartfile)</code>	<code>this</code>	Add a file attachment
<code>applyVariables(variables)</code>	<code>this</code>	Apply template variables in place
<code>getSubject(data?)</code>	string	Get processed subject with template variables
<code>getBody(data?)</code>	string	Get processed plain text body
<code>getHtmlBody(data?)</code>	string null	Get processed HTML body

Method	Returns	Description
<code>getCreationObject()</code>	<code>T</code>	Get the stored reference data
<code>validateAllEmails()</code>	<code>Promise<Record<string, boolean>></code>	Validate all email addresses
<code>toMimeFormat(data?)</code>	<code>Promise<object></code>	Convert to MIME format object
<code>toObject()</code>	<code>ISmartmailJson<T></code>	Serialize to JSON object
<code>toJson()</code>	<code>string</code>	Serialize to JSON string
<code>sendTo(target)</code>	<code>Promise<IMailSendResponse></code>	Send to a WireTarget

Static Methods

Method	Returns	Description
<code>Smartmail.fromObject(obj)</code>	<code>Smartmail<T></code>	Create from JSON object
<code>Smartmail.fromJson(json)</code>	<code>Smartmail<T></code>	Create from JSON string

WireTarget

Constructor Options

Option	Type	Description
<code>endpoint</code>	<code>string</code>	URL of the SMTP service endpoint
<code>authToken</code>	<code>string</code>	Optional authentication token

Methods

Method	Returns	Description
<code>sendEmail(email)</code>	<code>Promise<IMailSendResponse></code>	Send an email through this target
<code>updateSettings(settings)</code>	<code>Promise<ISettingsUpdateResponse></code>	Update settings on the target
<code>listMailbox(mailbox, options?)</code>	<code>Promise<IMailboxListResponse></code>	List emails in a mailbox
<code>fetchEmail(mailbox, emailId)</code>	<code>Promise<Smartmail null></code>	Fetch a specific email
<code>getStatus(deliveryId)</code>	<code>Promise<IMailStatusResponse></code>	Check delivery status

WireParser

Constructor

```
new WireParser(handlers: IWireHandlers)
```

Handler Interface

```
interface IWireHandlers {  
    onMailSend?: (email: Smartmail, options?) => Promise<IMailSendResponse>;  
    onMailboxList?: (mailbox: string, options?) => Promise<IMailboxListResponse>;  
    onMailFetch?: (mailbox: string, emailId: string) => Promise<IMailFetchResponse>;  
    onMailStatus?: (deliveryId: string) => Promise<IMailStatusResponse>;  
    onSettingsUpdate?: (settings: IWireSettings) => Promise<ISettingsUpdateResponse>;  
}
```

Methods

Method	Returns	Description
<code>parse(json)</code>	<code>WireMessage</code>	Parse a wire message from JSON string
<code>handle(message)</code>	<code>Promise<WireMessage></code>	Handle a wire message and return response
<code>parseAndHandle(json)</code>	<code>Promise<string></code>	Parse and handle in one step

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changelog.md for @push.rocks/smartmail

2025-11-29 - 2.2.0 - feat(wire)

Add wire protocol, WireTarget & WireParser, Smartmail JSON serialization; refactor plugins and update dependencies

- Introduce a wire protocol (ts/smartmail.wire.ts) with typed message interfaces and helper utils (createMessageId, createTimestamp) for microservice communication.
- Add WireTarget (ts/smartmail.classes.wiretarget.ts) to send wire messages to an endpoint (sendEmail, updateSettings, listMailbox, fetchEmail, getStatus).
- Add WireParser (ts/smartmail.classes.wireparser.ts) to parse and handle incoming wire messages on the SMTP/service side with handler callbacks.
- Add Smartmail JSON serialization/deserialization and transmission helpers (toObject, toJson, fromObject, fromJson, sendTo) and attachment base64 handling in Smartmail (ts/smartmail.classes.smartmail.ts).
- Refactor plugin exports (ts/smartmail.plugins.ts) to export node fs/path and to use SmartRequest default export (SmartRequest.create()).
- Update EmailAddressValidator.fetchDomains to use plugins.fs.readFileSync with encoding and the new SmartRequest create()/get().json() flow, falling back to local domains file on error.
- Bump devDependencies and dependencies in package.json to newer versions and change test script to be verbose.
- Adjust tsconfig.json: disable sourceMap and enable skipLibCheck (skipLibCheck: true).
- Export newly added wire modules from package index (ts/index.ts).

2025-05-07 - 2.1.0 - feat(smartmail)

Add new email validation helper methods (getMxRecords, isDisposableEmail, isRoleAccount) and an applyVariables method to Smartmail for dynamic templating.

- Introduced getMxRecords in EmailAddressValidator to extract MX records from DNS responses.
- Added isDisposableEmail to determine if an email is from a disposable domain.
- Added isRoleAccount to identify role-based email addresses.
- Implemented applyVariables in Smartmail to update subject, body, and htmlBody templates with provided data.

2025-05-07 - 2.0.1 - fix(readme)

Update documentation to include usage of creation object reference and update API details.

- Added a new section explaining how to use the creationObjectRef in Smartmail.
- Included detailed examples on retrieving and using the creation object reference.
- Updated the API reference to document the getCreationObject method.

2025-05-07 - 2.0.0 - BREAKING CHANGE(smarmail)

Improve email validation and Smartmail features: add detailed validation for email parts, caching for MX lookups, multi-recipient support, custom headers, and update dependency imports and build scripts.

- Updated dependency references from '@gitzone/' to '@git.zone/'
- Enhanced EmailAddressValidator with RFC 5322 compliance, local part, domain part validation, and detailed result fields
- Implemented caching mechanism for MX record lookups
- Expanded Smartmail class: added support for multiple recipients, reply-to, custom headers, and MIME formatting
- Updated build scripts, package configuration, and documentation with more comprehensive usage examples and tests

2024-05-29 - 1.0.24 - misc

This release improved several project configurations and documentation details.

- docs: Updated the project description.
- config: Revised tsconfig settings.

- npmextra: Adjusted npmextra.json with updated githost values (applied on multiple commits).

2023-07-28 - 1.0.23 - misc

A couple of targeted fixes and organizational changes were introduced.

- core: Applied a core fix update.
- org: Switched to the new organization scheme.

2023-06-13 - 1.0.22 - core

Over a longer period (versions 1.0.22 down to 1.0.4), a series of minor core fixes were rolled out to improve stability and maintainability.

These commits—which, aside from their version-marking commits, were solely “fix(core): update”—were consolidated into this summary.

2018-09-29 - 1.0.1 - initial

In the very early releases (from versions 1.0.3 to 1.0.1), the initial stabilization work set the stage for the project.

- npm: Adjusted access level (fix(npm): access level in 1.0.3).
- packagename: Updated package name details (fix(packagename): update in 1.0.2).
- core: Laid the groundwork with the initial core fix (fix(core): initial in 1.0.1).