Publishing service and chain specifications

Introduction

This document describes the basic functionality *Publishing service and chain specifications* of the *TIP-ecosystem*.

Words printed in italic refer to definitions described in the document basic functions and definitions for the TIP-ecosystem. Note: This document is published for consultation purposes and can be updated to a 1.0 version after implementation by TIP Partners. Comments on this document are appreciated via a message on our LinkedIn account.

The functionality is described in below in the following categories.

Description

This document describes the basic function of *Publishing Service or chain specifications* in the *TIP-ecosystem.* All parties within the *TIP-ecosystem* need to have certainty about which *Chain specifications* are available and which set of agreements is valid within the chain specifications.

Various specifications need to be published in order to enable Qualified information Exchange. We define 4 specification levels:

- Level 1: Embedded trust services
    - Specifications of how to connect with services providing basic functions to *Acting spaces*: e.g. signing data, validating signatures etc.
    - Every *Actor* interacts with the TIP-ecosystem using an *Acting space* of their choice. Each *Acting space* includes a set of embedded trust services necessary for basic interaction. These specifications allow providers of *Acting spaces* to include these embedded trust services in their offering.
    - While other systems than *Acting spaces* may connect with these services directly as well, the specifications for such connections are out of scope for this document.
- Level 2: *Service specifications (see figure 1)*
    - Specifications of how to connect to value added services specific for a chain: e.g. content schema validation.
    - Service specifications are published and governed by service providers, often in accordance with guidelines set by domain owners of chain specifications.
- Level 3: *Chain specifications (see figure 1)*
    - Specifications of what input is required, which services and interfaces (level 2) are used and what the output is of a certain chain.
    - Chain specifications are always governed and published by a domain owner.
- Level 4: *Customer process specifications* (*see figure 2*)
    - Specifications of which chain specifications (level 3) can be combined for a specific use case, providing an understanding of the customer process.
    - Customer process specifications can be published and governed by partnerships of multiple domains, ensuring their chain specifications are compatible.

A *Chain responsible, e.g. a* "domain owner" MUST publish *Chain specifications* in such a way that users can easily find the *Chain specifications*, have certainty about the source of the publisher and can automatically import the specifications for use.

The *chain specifications* are the overall specifications with the requirements for enabling data exchange. The chain specifications in itself can refer to sub specifications which also needs to be published. This can be:

- Schema specifications (taxonomy)
- *Signature* policies

- *Authorisation* policies
- *Service specifications*

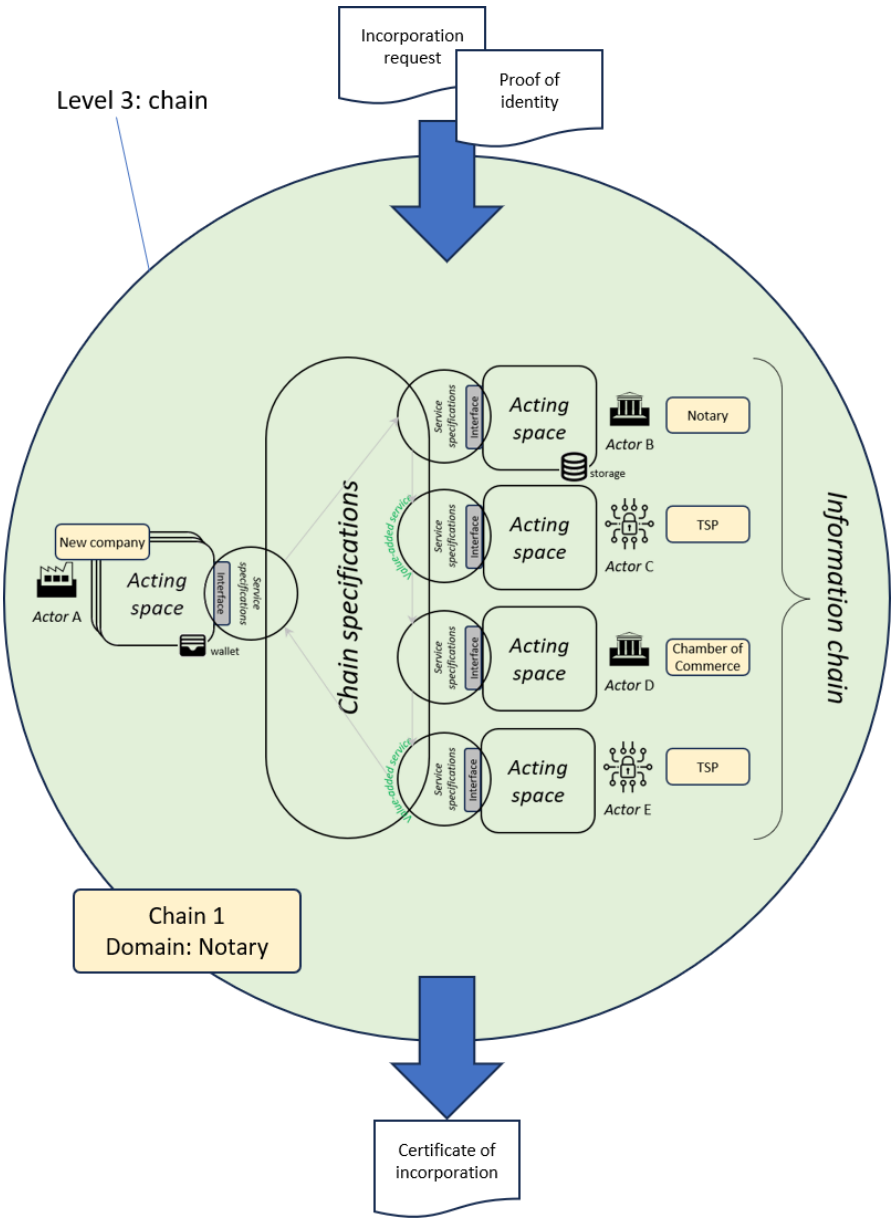

Figure 1: The relationship between *Chain specifications* and *Service specifications* in a notary domain regarding starting a new company

Legal context and requirements

For publication of *Information chain* specifications government bodies in the Netherlands must adhere to the provisions in "Algemene wet bestuursrecht". When drafting this document, we have

taken into account the provisions set out in articles 2.15, 2.16 and 2.17 “Afdeling 2.3. Verkeer langs elektronische weg”. Although these provisions only have legal effect for government bodies, the line of thought makes sense and is both beneficial for and compatible with any kind of formal digital social interaction.

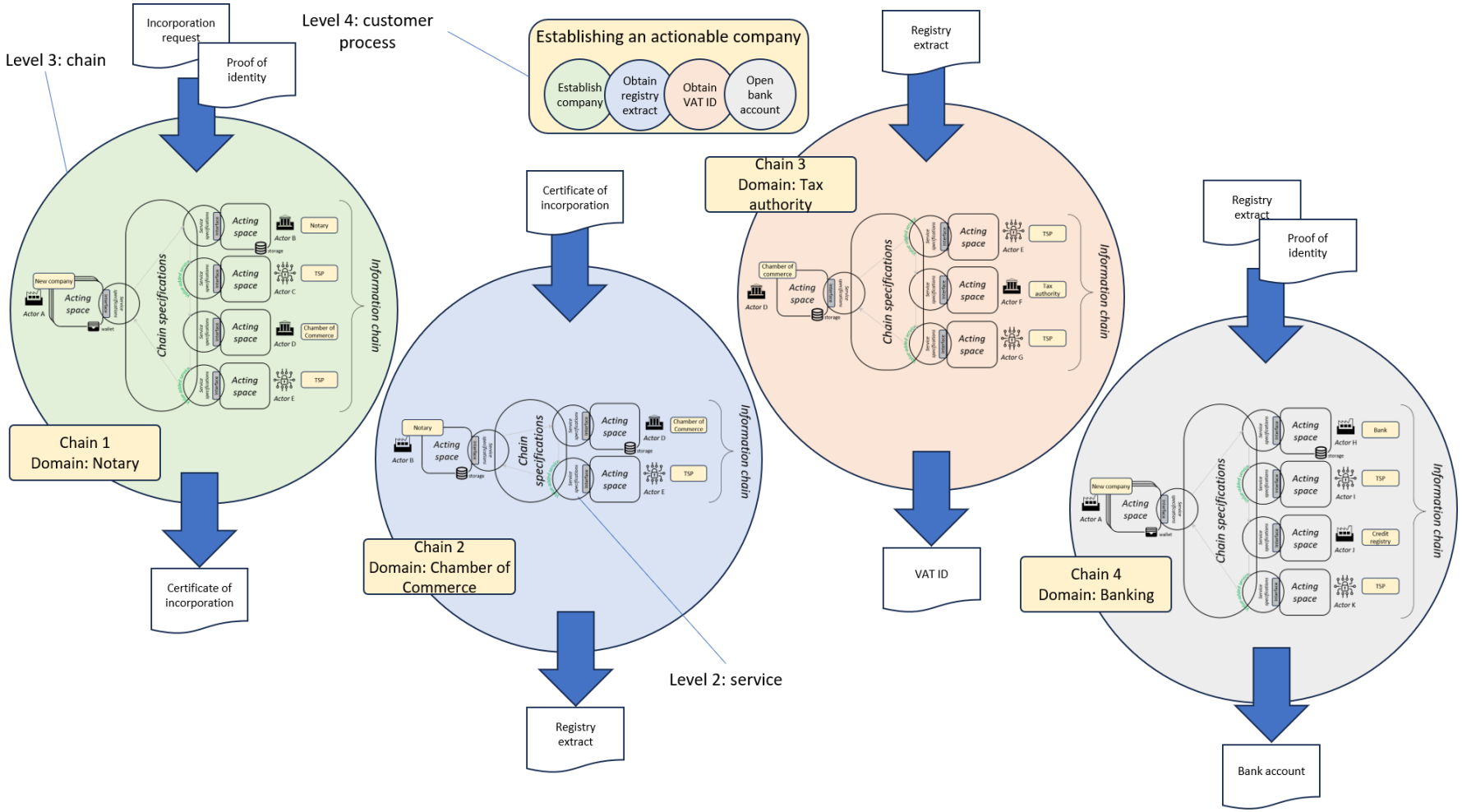

Figure 2: The relationship between a *Customer process*, an *Information chain* and *Chain and Service specifications*

Customer Process chain specifications

Table 1 provides an overview of the specifications to be published for a *Customer process chain*.

Specification	**Description**
Name	Logical name describing the *Customer process chain*
ID	A global unique identifier (URI)
Version	Version of the Customer Process chain specifications, unique within the version history of this *specification*
Validity from	An indication in a well-defined, unambiguous format, up to second-level precision, for the moment in time when the customer process chain becomes valid
Validity until	Reference to an external authorative and signed list in which end date is published. This allows the governance to publish or alter the end data without breaking the signature for the chain specifications. An implementation would be an URL to the REST API that provides the time stamp for the moment in time when the Information chain becomes invalid.
Description of the Customer process	URL to documentation that describes the *Customer process chain* in a way that those who implement it understand the business process and how that is captured. Such documentation often includes: - Interaction diagrams - Happy and error flows - Demarcation of (legal) responsibilities between *Actors* - Version history of the specifications - Contact information in case of disturbance/issues
Governance reference	URI reference to the governance and publication process for the *Customer process chain specifications*

Governance seal	Qualified electronic seal proving the provenance and authenticity of the *Customer process chain specifications*
Information chains	The *TIP ecosystem* wide unique identifiers of the *Information chains* in the order in which they appear in the *Customer process chain*, a precise machine-readable reference to a specific version of chain specifications, including a hash value.
Orchestration data	Optional reference to the process flow notation that describes the coherence and interdependence of *Information chains*, allowing automation of the *Customer process chain* based on the required inputs and outputs defined on the *Information chain* level.
Hash	Hash algorithm and digest value of the Customer Process chain specifications

Table 1: The required standard elements of *Customer process chain specifications*

(Information) Chain specifications

Table 2 provides an overview of specifications to be published. Many of these items refer to other TIP Basic functions that provide further detail on the content that is to be published.

Specification	**Description**
Name	Logical name describing the *Information Chain*
ID	A *TIP ecosystem* wide unique identifier (URI)
Version	Version of the information chain specifications, unique within the version history of this *Information chain*
Requesting party	*TIP ecosystem* address for the requesting party
Description of the chain	Documentation that describes the *information chain* in a way that those who implement it understand the business process and how that is captured in IT-services. Such documentation often includes: - Interaction diagrams

	- Happy and error flows - Demarcation of (legal) responsibilities between *Actors* - Version history of the specifications - Contact information in case of disturbance/issues
Validity from	Valid from
Validity until	Reference to an external authorative and signed list in which end date is published. This allows the governance to publish or alter the end data without breaking the signature for the chain specifications. An implementation would be an URL to the REST API that provides the Unix time stamp for the moment in time when the Information chain becomes invalid.
Governance reference	URI reference to the *Information chain* governance and publication process for the *Chain specifications*
Governance signature	Digital signature proving the provenance and authenticity of the chain specifications
Inputs	The products/documents required to start the *Information chain*
Outputs	The products/documents originating from an *Information chain* (and sometimes serving as input for the next *Information chain* in a *Customer process chain*).
Signature policy	A reference to one or more signature (or sealing) policies applicable in the chain specifications. See ETSI TR 102 041 V1.1.1 (2002-02) (TR 102 041 - V1.1.1 - Signature Policies Report (etsi.org))
Authorization policy	Provides “context” to the authorization, such as a human readable description of scope and legal consequences. A similar schema as used in the signature policy can be applicable here.
Authorization template	Template (technical schema in JSON or XML) for the TIP Basic function *Authorizing Actor*.

Attestation of attribute requirements	Reference to a sufficiently specific rulebook.
Interface specifications	submit-accept, endpoint, value added services, enddate of individual interface specification
Content specifications	XSD, XBRL taxonomy (entrypoint), JSON schema? Allowed attachments, signatures on content. Best practice is to publish both the technical format and associated example messages.
Identity LOA requirements	Required attributes of the identities of *Actors* and policies regarding the recognised sources of these attributes and the required levels of assurance
Reference to the Rulebook	Reference to the applicable Rulebook(s) which describes the authentic source for a credential, the issuing trusted service providers and the structure of the attestation with agreements on how the attestations can be exchanged
Value-added service restrictions	If certain restrictions apply to which *Value-added services* may be used in the *Information chain* these restrictions are specified. An example is a limitation to use only notified/certified services for validating certain documents.
Chain Level Agreement	Agreements (per domain/*Information chain*) concerning typical use of the chain (e.g. throughput times and volumes) from which the Service Level Agreements (SLAs) for the corresponding services can be deducted.
Hash	Hash value of the (Information) chain specifications

Table 2: The required standard elements of a *Chain specification* in the *TIP ecosystem*

Service specifications

Specification	**Description**
Name	Logical name describing the service
ID	Ecosystem wide identifier (e.g. end point)
Version	Version number (including build)
Owner	URI to one organization responsible for service

Owner signature	Digital signature proving origin and authenticity of the Service specifications
Description	URL to a clear description of the offering provided with the service. This includes prerequisites for usage and pointers to subscription forms (if required). Described in markdown.
Costs (optional)	URI to clear description of the costs and payment options for the service. Described in markdown.
Information objects (request, reply)	XML-schema, JSON Schema, etc.
SLA (optional)	URI to the applicable SLA published in markdown.
QoS (optional)	URI describing available QoS options described in markdown.
Standards	“OAuth 2.0”, “XBRLJSON”, etc.
Authentication schemes	The supported authentication schemes (e.g. "nl.digid”, “eu.europe.eudi”)
Privacy policy	URL to the applicable privacy policy, described in markdown.
Trust requirements	Which root of trust is required to use the service e.g. “Staat der Nederlanden - G3”
Documentation	URL to information on how to establish a connection and use the service. Described in markdown.
Sample code	URL to a git with sample code for using the service
Hash	Hash value of the Service Specifications
RSS-feed	The URL of the RSS-feed with announcements about new versions or maintenance outages

Table 3: The required standard elements of a *Service specification* in the *TIP ecosystem*

Area of applicability

Chain specifications are mandatory for exchanging data within the TIP ecosystem. *Service specifications* are mandatory for relying parties and providers of an *Acting space*. *Customer Process chain specifications* are optional.

Agreements

Responsibilities and publications of specifications

Domain governance is responsible for customer process specifications and information chain specifications. Each domain must describe and publish their governance structure for publishing specifications. Elements that should be described include publication frequency, decision making procedures, options for consultation, consultation timelines, etc.

Providers of services are responsible for the service specifications.

TIP provides a framework for publishing customer process, information chain and service specifications, but is not substantively responsible for the content or accuracy of the specifications.

Standards

Chain and service specifications comprise of both human readable and machine-readable components.

Level	Target audience	Goal
Level 4: Customer process	Business architect, business owner/manager, ..., lawyer, regulator	Providing an understanding of the customer process. Proof of compliance of laws and regulations.
Level 3: Chain specification	Architects, subject-matter experts, developers	Clear and concise description and specification of a chain, providing understanding for implementation and troubleshooting. This contains specified inputs and outputs for all activities within the chain relationships between Actors and Services.
Level 2: Service specification	Developers, architects, subject-matter experts	For implementing a working interface

Level 1: Embedded trust services	Specialist-developers,	For creating trust

The human readable helps subject-matter experts and software developers to understand and correctly implement the chain specifications in their organisation or IT-landscape.

The machine-readable components of the chain specifications enables automated processing after importing these components into *Acting spaces* or *Value-added services*.

Requirements & best practices

Markdown as good practice for content documentation and versioning.

Multiple standard setting organisations using, or moving towards, Markdown as markup language for describing and publishing chain and service specifications. These include Logius for new standardisation projects, Zorginstituut Nederland for the KIK-V standards, the EU for Architecture Reference Framework, IDSA for the Reference Architecture Model, and various others.

One of the reasons to use markdown is the widespread support for tooling to describe and publish text alongside machine-readable specifications and parameters. Version control of descriptive texts alongside technical specifications is a key aspect of our design. Version control is not only relevant for a high level of automation, but also for legal effect. For any timestamp the exact set of customer process specifications, chain specifications and service specifications can be retrieved. This is of value in case of troubleshooting or a legal dispute, making it one of the decisions that helps to bring additional trust in information exchange.

Markdown is meant for human-readable text only. This can be text (such as API documentation) to help out developers to implement specifications, but can also be used to publish texts of value to the end user of the information chain.

The machine-readable schemas and policies will use other formats than markdown, for instance JSON, XML, etc.

Publication lifecycle for chain specifications

A typical lifecycle for the publication of Chain specifications includes the phases of Draft, Published and Superseded.

Draft phase

- Draft versions of Chain specifications MUST be clearly marked as such.

- An open process for drafting new versions of Chain specifications SHOULD be in place. This allows all stakeholders the opportunity to observe proposed changes as early as possible.
- A methodology for registering and processing feedback from stakeholders SHOULD be in place.
- Publication timelines and process SHOULD be clearly described.

Publishing chain specifications

- Chain specifications MUST be published in accordance with the governance agreements set in that domain.
- Chain specifications MUST contain a reference to the publisher of the specifications and SHOULD include its authority to do so and the process in which the in which the specifications were established.
- Chain specifications SHOULD be publicly available, unless there are compelling reasons to limit access.
- Published Chain specifications MUST include the validity date(s) and scope of their application.
- Published Chain specifications MUST contain proof of origin and authenticity. A best practice is to use the TIP Basic function Signing data.
- The workflow for publication SHOULD include a compliance-by-design methodology to guarantee publication in accordance with agreements.

Superseded phase

- Superseded versions of the Chain specifications MUST be clearly marked as such.
- Superseded published versions of the Chain specifications MUST be retrievable for as long as these are relevant for interpretation of data exchanged with them. Such requirements may include the defined timelines in which legal disputes may arise.
- Superseded versions of the Chain specifications MUST be retained with their validity dates and associated proofs of authenticity.
- Retention of superseded versions of the Chain specifications SHOULD be archived using the TIP basic function Archiving data.

Human and machine access of chain specifications

- Chain specifications MUST also be retrievable by machine in order to function as guidance when drafting or validating documents such as signatures, seals, authorizations and substantive documents.
- A versioning process MUST be in place for human and machine to determine which version(s) are currently active, or whether they are historic or draft versions.

Supplier(s)

Domain governance is responsible for publishing the Customer process chain specifications and Information chain specifications.

Value added service providers and trust service providers are responsible for publishing the Service specifications of the services they provide.

A possibility for value-added services providers is to provide Domain governance and valued-added service providers with a managed publication platform for publishing their Customer process chain specifications, Information chain specifications and Service specifications.

Administrator(s)

TIP governance will provide a high-level overview of published specifications at the highest level available (customer process of chain specification). This serves merely as a root index to help TIP partners and others to navigate the landscape of TIP implementations.

Implementation of TIP is carried out by the individual TIP partners within the domain governance. Therefore, the TIP governance itself does not publish any implementation-specific specifications.

Regulator(s)

Unlike certain other TIP Basic Functions the *Publication of Chain and Service specifications* is not provided as a trust service as defined by eIDAS 2.0 regulation. As a result, there is not a regulator for this basic function in the Netherlands or at the European level. Domain governance is applicable as described in administrators.

Costs

Cost of publication of the chain specifications are covered by the individual TIP partners. The cost of the hosting and maintenance of the index should be paid centrally by TIP.