



E-Procurement Hub Service Technical Requirements

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Release for Hub Services RFP

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Executive Summary

This document is part of technical perspective of the E-Procurement Architecture and it describes the technical requirements for the E-Procurement Hub Service.

This document is intended to be a living document and the requirements will be updated as requirements are refined and revised through the process of consultation and further planning. In time, the document will be used as input into the set of conditions to be enforced by a future E-Procurement Certification Authority. It may also form a template for Service Level Agreements entered into by hubs and their clients. Initially, this document will be reviewed by NEHTA Staff, Jurisdictional Representatives and NEHTA Reference Groups.

The technical requirements cover the following areas:

- An overview of the *Context* of the relationship of the E-Procurement Hub Service with other roles involved in Health Supply Chain;
- *Scalability requirements*, which covers the anticipated size of the system required to support some subset of national health e-procurement;
- *Performance requirements*, which describes the required support for transaction rates and performance response times for some subset of national health e-procurement. This version of the document assumes the existence of several complimentary E-Procurement Hubs, each with the ability to forward messages via other hubs to the appropriate end party;
- *Availability requirements*, which defines the reliability requirements, such as the hours of operation and percentage of time available;
- *Security requirements*, which outline requirements for authentication, authorization/access control, auditing, etc.

1 Introduction

1.1 Purpose

This document is part of a series of documents describing the technical architecture of health e-procurement, and it describes the technical requirements. The document is intended to be used as input into the governance of e-procurement testing, and to terms of Service Level Agreements or other commercial arrangements between Hub providers and their clients (the jurisdictions and their suppliers).

1.2 Document Context

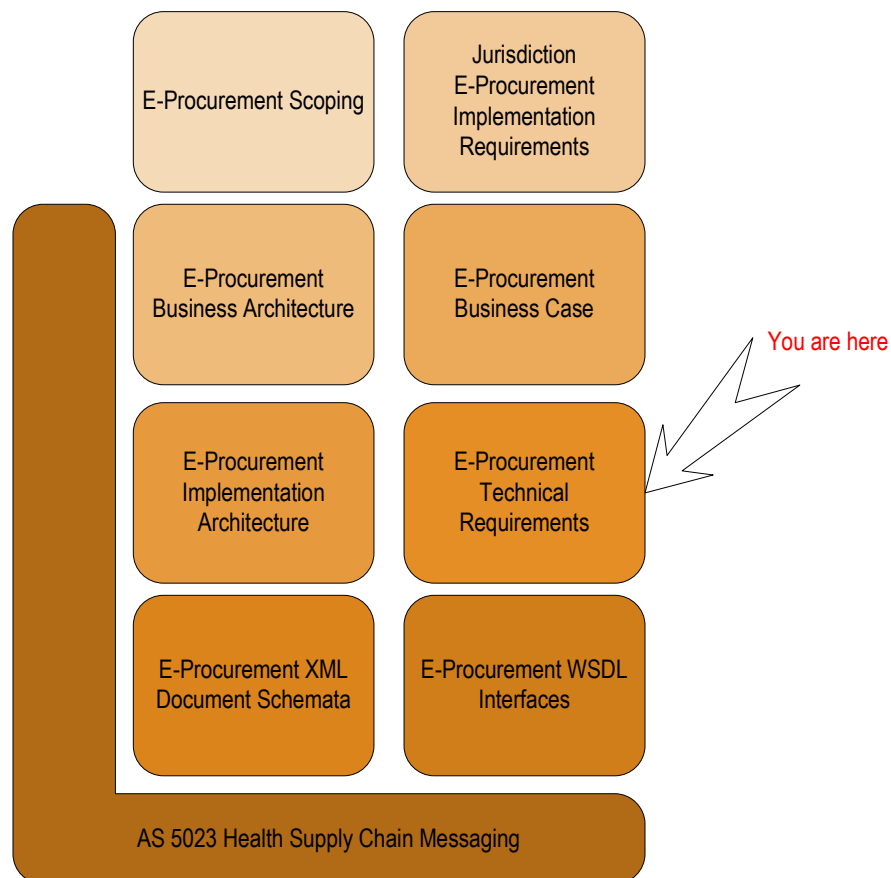


Figure 1: Document Roadmap

The documents shown in Figure 1 are being produced in top to bottom order, with the AS 5023 standard underpinning all of the technical documents.

1.3 Intended Audience

This document is intended for:

- Jurisdictional Representatives; and
- NEHTA Supply Chain Initiative Project Reference Group Members

This document assumes the reader is familiar with the following:

- NEHTA's E-Procurement Scope

- E-Procurement Business Architecture

As the key focus of this document is technical requirements, there will be elements of the requirements that are written for a more technical audience.

1.4 Scope

This document is to provide technical requirements for:

- E-Procurement Hub Service.

In addition to this, this document also provides technical requirements for:

- Clients of E-Procurement Hubs

1.4.1 Out of Scope Requirements

This document is not intended to provide:

- Detailed system requirements. These will be provided later as part of a governance framework for e-procurement.
- Requirements for authentication and authorisation services.
- Organisational and informational requirements.

1.5 Sources of Requirements

The key requirements in this document have been drawn from NEHTA's E-Procurement Technical Architecture.

In order to ensure that the requirements are comprehensive, a number of other sources have been consulted. These include:

- HealthConnect Business Architecture Specification of Business Requirements, Version 1.9g Attachment
- HL7 EHR System Functional Model: A Major Development Towards Consensus on Electronic Health Record System Functionality, 2004.

1.6 Limitations

This document is intended to be a living document and the requirements will be updated as requirements are refined and revised through the process of consultation and further planning.

There are two key requirements areas, scalability and performance, which are dependent on the implementations of e-procurement hubs.

Similarly, the priority assigned to each requirement will be dependent on various governance and commercial arrangements between the hubs and their clients. Therefore this document does not assign priorities to requirements until the governance framework is in place.

1.7 Requirements Identification

The requirements in this document are uniquely identified using the following format:

<Requirements category>.<requirement#>.<sub-requirement#>

Each of the requirements comes from one of the following categories:

Requirements Group	Title
AVL	Availability
CLS	Compatible Local System
DOC	Documentation
INT	Interfacing
PER	Performance
SAO	System Administration and Operational Requirements
SCA	Scalability
SEC	Security
SUP	Support
TRA	Training
USE	Useability

1.8 Definition of Terms

When the following terms are used in this document, they are used assuming the following document specific definitions:

Distributed	The dividing and spreading out of hardware and software, usually geographically, to avoid concentrating the system into a single unit. This is commonly desirable for availability and scalability purposes.
Failover	The automatic and transparent use of redundant hardware and/or software when a component fails, to ensure normal processing continues. Ideally, the users of the system will not become aware of the failure, that is they will perceive that the system is working normally.
Instance	A single physical occurrence of a system. The following are examples relevant to this document: <ul style="list-style-type: none"> – a distributed system is made up of multiple instances working together, or – the failure of one instance will trigger the failover to another instance to continue the processing.
Persistent	A property of data that guarantees it will be preserved. This property normally refers to the difference between data that has been saved to disk and data that is held in volatile memory. Data will be persistent after it has been saved, but before it is saved it can be lost if the computer crashes. An example relevant to this document is the persistence of auditing data access. The system needs to guarantee that if transmits or receives a business document then immediately crashes, that the audit trail will still contain a record of the transmission.
Redundant	Additional capacity (hardware or software resources) that is not used to satisfy normal system requirements. This capacity can be used in a failover situation to maintain system availability. An example relevant to this document is the need for redundant servers, networks and software instances such that the failure of any one will not stop buyers and sellers exchanging business documents.
Throughput	The quantity of work processed by the system. An example relevant to this document is the number of event summaries being stored per day. This is distinct from the response of the system which is how fast each request is processed.

2 Context

As illustrated in Figure 2, the E-Procurement Hub Service sits between buyers and suppliers, with the ability to forward messages via other hubs to parties connected to those hubs.

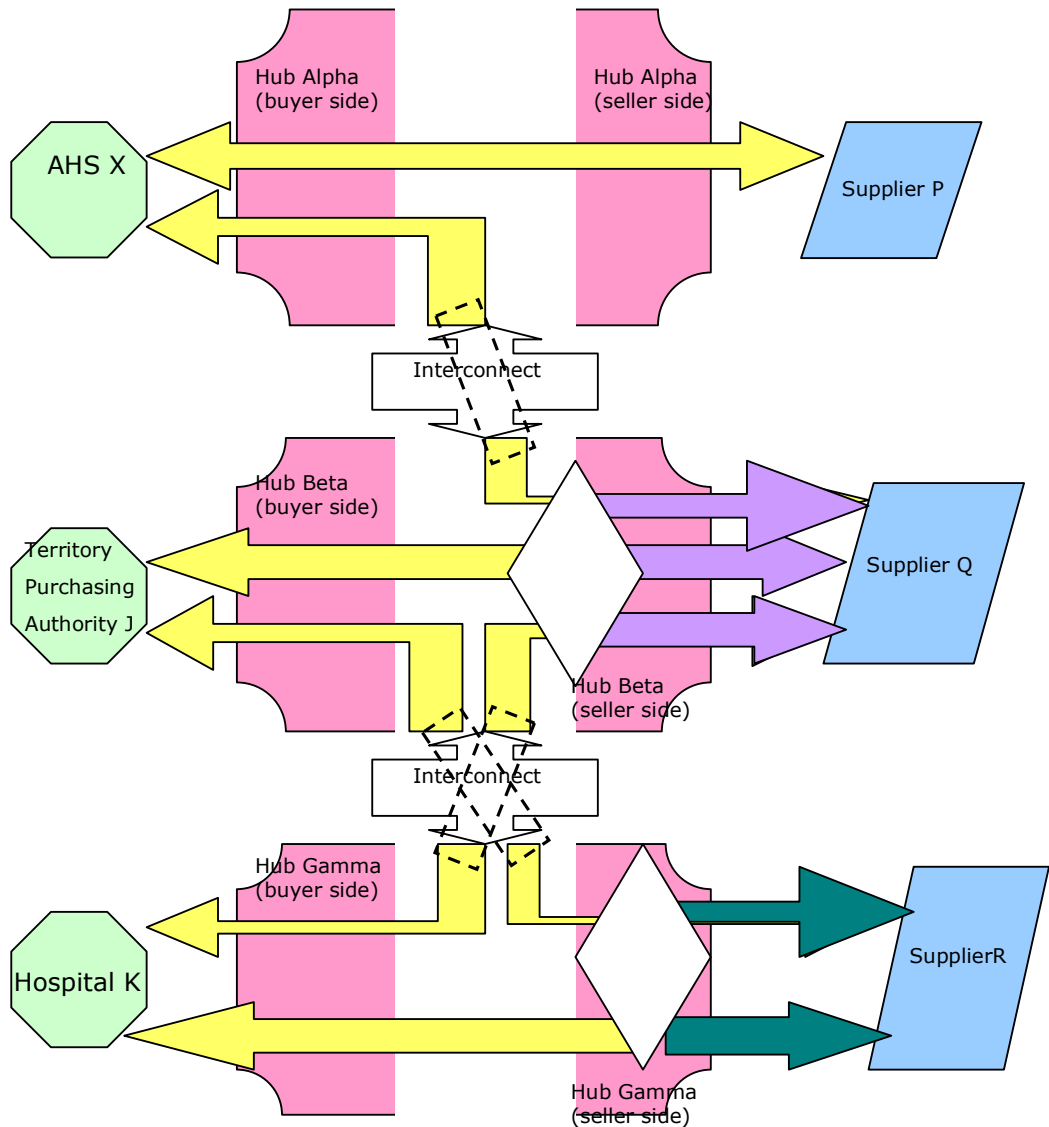


Figure 2: Architectural Context

3 Performance Requirements

The requirements in this section apply to the E-Procurement Hub Service(s).

3.1 Transaction Rates

- PER.01.01** Each E-Procurement Hub Service will be required to handle the normal and peak loads for Business Document transmission as well as meeting the response time targets.
- PER.01.02** Each E-Procurement Hub Service will be required to handle a sustained transaction rate. There are several different types of transactions that the E-Procurement Hub Service must handle. Each transaction type has the same response time and throughput targets.
- PER.01.03** Each E-Procurement Hub Service will be required to handle a peak load over a specified window.
Peak loads will often occur at a known busy time but the E-Procurement Hub Service will be required to handle the peak load at any time. During the window the normal requirements for response time is relaxed. The window for handling a peak load is the amount of time the E-Procurement Hub Service will be required to maintain the peak throughput and response times. If a peak period lasts longer than the peak window the E-Procurement Hub Service may further degrade.
- PER.01.04** Each E-Procurement Hub Service will be required to handle the following transaction response times for sustained throughput (off peak) and peak loads.

Transaction Type	Off-Peak Times (seconds)	Peak Times (seconds)	Assumed Peak Window
Time to receive document of less than 1Mb, translate if necessary, and make available for pickup by receiving party – 90% case	180	360	0.5 hours
Time to receive document of less than 1Mb, translate if necessary, and make available for pickup by receiving party – 10% case	600	600	0.5 hours
Time to receive document of between 1Mb and 10Mb, translate if necessary, and make available for pickup by receiving party – 90% case	300	600	0.5 hours
Time to receive document of between 1Mb and 10Mb, translate	600	900	0.5 hours

if necessary, and make available for pickup by receiving party – 10% case			
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3.2 Queuing Characteristics

PER.02.01 Each E-Procurement Hub Service will be required to buffer and queue a set of business documents, as high availability of recipients for these documents is not assumed. A Hub accepting a business document is expected to store this document in multiply redundant storage until such time as the recipient is available to receive a copy.

PER.02.02 Buyers shall be provided with a capability by the hub to set per-Supplier non-receipt notification thresholds with a granularity of no less than 15 minutes.

4 Scalability Requirements

The requirements in this section apply to the E-Procurement Hub Service.

SCA.01.01 The E-Procurement Hub Service will be required to scale in terms of:

- Throughput, and
- Response time

SCA.01.02 As the transaction load on the E-Procurement Hub Service increases, the throughput will be required to increase. Otherwise the transactions will eventually become backlogged.

SCA.01.03 The E-Procurement Hub Service will be required to maintain the response time targets (see section 3.1 Transaction Rates) as the load grows.

4.1 Number of Users

4.1.1 Concurrent Users

SCA.02.01 The E-Procurement Hub Service will be required to handle the volume of concurrent Buyers and Sellers accessing the system. It is expected that use of the system will increase over time. The following are estimates at the 3 year point. (Note that the numbers are across all jurisdictions, and these logins are expected to be distributed across a number of hub providers.)

	Number of Buyers Expected at 3 years	Concurrent logins (20% of total)	Peak Concurrent logins (75% of total)
Buyers	300 ¹	60	225
Sellers	400	80	300

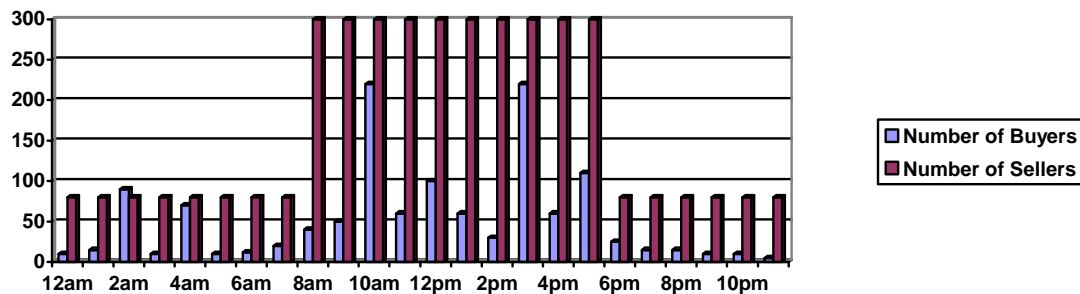


Figure 3: Estimated Distribution of Concurrent Logins

The graph in **Error! Reference source not found.** shows the expected number of logins during a typical 24 hour weekday period.

The number of buyers is based on the total number of purchasing centres across the jurisdictions, each represented by a single authorised user. The work patterns show two small spikes in activity at 2am and 4am to represent batched consolidated orders being made automatically overnight, with some variance based on the time zone of the jurisdiction. The other peaks are at

¹ This figure is based on the total number of procurement centres as reported by jurisdictions in their procurement landscape questionnaire.

10am, when much of the first ordering of the day will occur on the east coast, with a smaller spike two hours later to represent the equivalent time of day in Western Australia. Similarly there two peaks at 3pm and 5pm to represent post-lunchtime purchasing on east and west coasts respectively.

The number of Sellers logged in at any time is unknown, so a simplifying assumption has been made that during business hours, a peak of up to 75% of Sellers may be logged in, and outside of business hours 20% will be logged in. This assumption may be replaced by more realistic figures in a future draft.

5 Availability Requirements

The requirements in this section apply to the E-Procurement Hub Service.

It is expected that once the E-Procurement Hub Services are in common use, their extended unavailability would cause material disruption to the provision of health care.

The E-Procurement Hub Service will be required to maintain availability of core document transmission services. From the perspective of the end users, the system will interact with them and function correctly. This does not mean that parts of the E-Procurement Hub Service cannot fail, it specifically means that the failure of the core services will not be noticed by the end user. This generally involves an alternative component (usually with identical functionality) taking over from a component that, for any reason (bottlenecked or crashed), cannot service a user's request. This requires redundant capacity to be available.

5.1 Availability Characteristics

AVL.01.01 The E-Procurement Hub Service will be required to deliver availability of the core business document transmission services for at least 98% of the time over any monthly period. This equates to a combined total of 14.4 hours each month where Buyers *could* experience loss of service.

Availability percentage	98%
Total hours per month where user's can experience loss of service	14.4 hrs/month
Maximum unavailability in a single business day (5% of month tot)	43 minutes
Maximum unavailability in a single period out of business hours (20% of month tot)	90 minutes

It would be undesirable if the system was not available for use for a single period of 14.4 hours in a month – especially if this overlapped significantly with a business day. During business hours (9am to 5pm in the time zone of the Buyer), any one period of unavailability shall be limited to 3% of the monthly total. This requires no more than 26 minutes of unavailability during a single business day. In addition, the total time unavailable for a single period of downtime out of business hours should not exceed 90 minutes (approx 10% of the monthly total).

AVL.01.02 The availability target in **AVL.01.01** is for the core service of transmitting business documents, including:

- Accepting documents from Buyers and Sellers.
- Translation of formats between those used by buyers and sellers (e.g. NEHTA XML, and legacy EDI, or CSV files)
- Forwarding of documents to their intended recipient, or to another hub.

AVL.01.03 The availability target in **AVL.01.01** does not include:

- Uploading of consolidated transactions (or other non-core services)
- Running and viewing reports
- Administration and operation functions

- AVL.01.04** Disaster recovery is completely excluded from the availability target in **AVL.01.01**. See section 5.4 Disaster Recovery for the requirements to address a disaster. A disaster will cause disruption to the user and loss of service is expected for an extended period of time.

5.2 Hours of Operation

- AVL.02.01** The E-Procurement Hub Service will need to support business document delivery 24 hours of the day. However, it is expected that the bulk of transactions will occur during business hours. Therefore the capacity of the system may reduce outside those peak hours, and resources may be directed to other activities such as backups and maintenance.

5.3 Failover Characteristics

The requirements in this section apply to the selected core services as specified in 5.1 Scope of Availability Characteristics.

- AVL.03.01** As far as practical, the E-Procurement Hub Service is required to ensure that unplanned failures are handled without the Hub's clients having to deal with the failure. This implies failing over to redundant services if the primary service fails.

5.3.1 Unplanned Failover

- AVL.03.02** The E-Procurement Hub Service will monitor and detect failures in components and automatically route requests to functioning components to maintain continuity of service.

- AVL.03.03** An unplanned failover will preserve business documents which have received positive technical acknowledgements, and deliver these to their intended destinations, but it is not required to preserve user sessions. New requests for user sessions will be processed to allow users to re-connect and continue working.

5.3.2 Planned Failover

- AVL.03.04** The E-Procurement Hub Service will support planned failovers to allow for administration, and maintenance (including upgrades) of the system. Planned failovers allow components to be taken offline without causing any disruption to service. This should be transparent to users.

5.4 Disaster Recovery

A disaster is a severe, infrequent and unexpected event that affects the availability of the E-Procurement Hub Service. Without appropriate disaster recovery planning, a disaster can easily cause the system to completely fail and recovery may take an unacceptably long period of time. It is impossible to protect against all possible events and a disaster recovery strategy based on a comprehensive risk assessment is required in the event of a catastrophic disaster.

- AVL.04.01** A disaster recovery strategy needs to be developed on the basis of a comprehensive risk assessment.
- AVL.04.02** The disaster recovery strategy must be available for perusal by clients of an E-Procurement Hub Service.

6 Security Requirements

6.1 General Security

The requirements in this section apply to the E-Procurement Hub Service.

- SEC.01.01** The E-Procurement Hub Service will be required to appropriately identify who is requesting use of the service (Authentication), and who is responsible for transmission of business documents (Attribution).
- SEC.01.02** The E-Procurement Hub Service will be required to enforce who has access to what functions and data (Access Control).
- SEC.01.03** The E-Procurement Hub Service will be required to ensure data is appropriately secured when it is sent externally such that only the intended recipient can access the data (Protected Data Exchange).
- SEC.01.04** The E-Procurement Hub Service will be required to keep a record of all system uses such that system administrators can trace who did what and when (Audit).

The combination of Authentication, Attribution and Access Control assists in protecting the E-Procurement Hub Service against malicious destruction and forged business document transmission by ensuring that access to the system interfaces is granted only to appropriate users and all transactions can be traced back to those users.

6.2 Attribution

- SEC.02.01** The E-Procurement Hub Service will attribute all transmissions and receptions of business documents to a single user or system, accurately and persistently. The E-Procurement Hub Service will retain the necessary attribution data that a user or system transmitted a document at a specific date and time.

For example, a Purchasing Officer sent a Purchase Order, or a Seller received a Remittance Advice, or a hub forwarded an Invoice to another hub.
- SEC.02.02** The E-Procurement Hub will not transmit a document to, or accept a document that cannot be attributed to a single user or system. This means that the Hub will be able to identify who is responsible for each document transmitted through its systems.

6.3 Access Control

- SEC.03.01** The E-Procurement Hub Service will only allow access to authenticated users and systems.
- SEC.03.02** The user attribution associated by an E-Procurement Hub Service to an organisation to for administrative and other functions, and the access control policies afforded those users, is outside the scope of this specification.

6.4 Audit

- SEC.04.01** The E-Procurement Hub Service will not process document transmission or administrative requests if for any reason a record of the access cannot be kept persistently.