



# National Infrastructure Platform Services

## Architecture Principles

### **Purpose**

The Architecture Principles document clarifies the key principles established as part of the Architecture Strategy.

The principles guide the selection, creation and implementation of architectural solutions that meet the needs of the enterprise.

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## Document Control

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## Executive Overview

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### Background

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The Health Sector is a complex, multi-faceted business that services a geographically dispersed catchment across the whole of New Zealand. This profile means that there is heavy reliance on technology to support business services and processes.

The technology that supports these business services has historically been delivered in a piecemeal, fragmented manner, without adherence to overall guiding frameworks, or as part of a cohesive sector strategy. Typically investment occurs driven at local levels, with little or no alignment to national objectives, or the ability to derive value from scale.

With the advent of a national and regional focus in the health sector, and a move away from the historically fragmented approach, there is a key requirement to understand the potential impacts associated with the move to a regional or national approach, the viability of such a move and the value proposition that this strategy does or does not deliver.

A feasibility study has been prepared to allow for an informed assessment by the primary stakeholders in a national infrastructure, Health Benefits Limited, the National Health IT Board and the 20 DHB's.

Subsequent to this study, it has been decided to continue pursuing this initiative and HBL has been tasked with preparing a "Case for Change" for the National Infrastructure Platform Services. These Architecture Principles provides the basis for decision making for the on-going development of the National Infrastructure Platform Services.

### Context Reference

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The National Health IT Plan sets strategic direction for health sector ICT investment through a portfolio of workstreams. HBL, ITHB, DHBs and the Bipartite Action Group (responsible for change management arising from DHB restructures or service changes) have agreed to the following activities and scope for the National Infrastructure Programme (aligned with the Health IT Plan workstream 8):

1. Prepare a baseline operating cost and resource profile for Information Services (IS) functions.
2. Understand the current state of ICT activity across the DHBs and Regions
3. Identify options for cost savings and benefits across the sector, for sector reinvestment, through optimising process, people and systems
4. Work with the Sector's established IS groups, DHBs and Central Government, to identify preferred options and to provide these to DHBs for consultation with staff and unions.
5. Subject to consultation; detailed planning activity; further evaluation of the options and finalisation of any business cases; lead and develop projects to implement the business cases
6. Lead and support the development of national standards, procurement and governance for the National Infrastructure Programme.

The National Infrastructure Programme is working closely with other HBL Programmes to design and deliver common supporting Infrastructure, Services and Platforms to enable the delivery of the sector benefits attributable to those workstreams (FPSC, HRIS, FMSS).

A key focus for the Programme is to support and enable greater levels of clinical integration of health care services via the provision of national information systems, common platforms and services, available to the whole sector, regardless of where patient health care is provided. Other areas being contemplated include supporting local, regional and national collaboration between health care professionals across and beyond what have been traditional DHB boundaries. Reducing duplication of effort, and the consolidation of common requirements, to deliver efficiencies of scale are also of importance.

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## The role of Principles

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To meet business need and principles articulated in business cases and to ensure that information technology alignment occurs, Sector Architecture develops solutions by following industry best practise frameworks in the Architecture, Business Requirements, Project Management and Service Delivery Domains.

In the Architecture Domain, this is achieved by the Health Sector using an Enterprise Architecture Framework, based on industry “best practice” TOGAF methodology and it is aligned with the national architectures being developed by the Health Sector Architects Working Group and HealthBase.

This alignment increases the ability to make informed investment decisions through the increased use of standards whilst maintaining flexibility through a reduced dependence on localised specialist skill sets. HealthBase further facilitates sharing of information and knowledge between organisations across the health sector.

The principles will be used to guide the selection, creation, and implementation of technology solutions that will ensure the proposed solution benefits are achieved.

The characteristics of the principles in this document are descriptive rather than prescriptive. This feature allows the principles to be decoupled from any specific technologies enabling the benefit of on-going reuse.

A further characteristic is that the principles maintain product/vendor competitiveness. This will maximise the Health Sector’s current investment whilst providing a viable transition path to targeted technologies.

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### What are Principles?

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Principles are critical to achieving the goals and objectives of the Health Sector.

- Architecture Principles define the underlying general rules and guidelines for the use and deployment of all information technology resources and assets across the Sector
- They reflect a level of consensus among the various stakeholders, and form the basis for making future IT decisions.
- Are long-term statements that are simple and direct, and frame how an organisation intends to make decisions relating to information technology.

This Platform Principles document defines the key principles which will inform the vision and reference architecture for National Infrastructure Platform Principles

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### Why are Principles Important

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- Principles allow us to make decisions without revisiting the fundamentals of what we are trying to achieve.
- They allow us to make strategic decisions without reinventing strategy
- By basing decisions on previously agreed Architecture Principles instead of working from first principles, we can make difficult decisions on Information and Communications Technology (ICT) architecture and solutions consistently, easier and faster.
- In an organisation as large and complex as the Health Sector, a set of widely understood decision making principles is a powerful technique to build a cohesive ICT architecture

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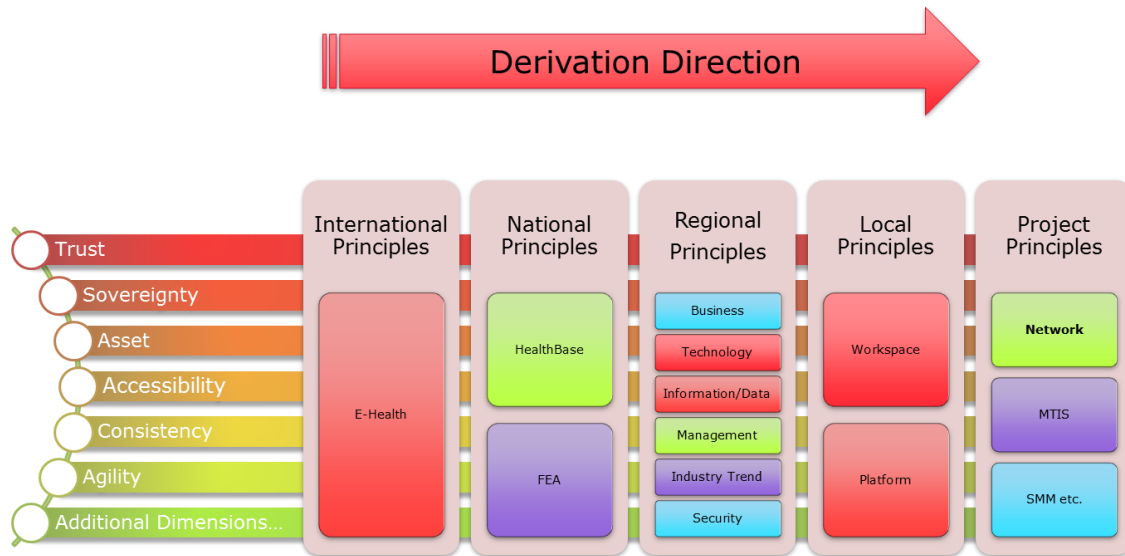
### Derivation of the Platform Principles

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Derivation and creation of the Platform principles is achieved by applying established international, national, regional, and principles to the specific requirements of a particular project.

This ensures that there is inheritance and traceability in place to anchor project level principles to the overall architecture and ensures alignment and compliance at all levels of the Enterprise Architecture.

The diagram below shows the mapping of Principles through to local project principles.



This derivation is more fully described in the remainder of this document. This process however gives rise to the Architecture Platform Principles, that are to be ratified as the Principles for the National Infrastructure Platform Services stream of work.

### Resultant Platform Architecture Principles

The following table provides a summary of the principles that will govern National Infrastructure Platform Services architecture and change plan.

Principle	Name	Statement
1	Secure by design	The architecture shall ensure security considerations are commenced from the requirements phase of development and are treated as an integral part of the overall system architecture.
2	Accessibility	The architecture shall provide users the necessary role based access to systems and data to perform their duties, function or task but shall have no other access
3	Reuse of Capabilities	The architecture shall ensure the reuse of suitable existing capabilities, within the Health Sector. Reuse is mandated over the development or acquisition of duplicative capabilities.
4	Performance and Functionality	The architecture shall ensure that the level of functionality is appropriate for the purpose that is being attained and shall provide sufficient capacity to allow the supported systems to perform as required.
5	Simplicity	The architecture shall be kept as simple as possible whilst still meeting the requirements of the business.
6	Innovative and Agile	The architecture will be innovative and agile, and shall support the incorporation of new technologies to support business and technology innovation.

		Architectures that increase agility & scalability shall be preferred.
7	Compliance	The architecture shall ensure information systems and processes comply with all relevant laws, policies, standards, guidelines and regulations.
8	Supportability	The architecture shall be supportable individually and as a whole.
9	Mobility	The architecture shall provide secure access to the required data and applications regardless of location or device.
10	Support for Changing Requirements	The architecture shall provide for the evolution of immediate and long term requirements.
11	Sustainable	The architecture will endorse and encourage the adoption of solutions that are designed to reduce waste and minimise the use of resources
12	User-centric	The architecture shall recognise the importance of the user, so that services and processes are effective and efficient both for the user and the system.
13	Testability	The architecture shall be designed to allow testing by simulation of the production environment to a degree appropriate for the level and type of testing.
14	Affordability	Affordability both in Capital and Operating Expenditure is a requirement of all projects and initiatives, and a core requirement for the Sector
15	Open Standards	The architecture shall provide for open standards where appropriate.

## Purpose of this Document

This document defines the key principles which have been established as part of the National Infrastructure Platform Services architecture function, and details the specific principles that relate to the ICT requirements for the National Infrastructure Platform Services.

- The principles will guide the selection, creation, and implementation of technology solutions that meet the needs of the Health Sector.
- The content of these principles have been designed to be descriptive rather than prescriptive in nature. This decouples the principles from any specific technologies/solutions and gives them an enduring, and seldom amended, property that the Sector can re-use.
- The principles are intentionally designed to be as product/vendor agnostic as possible to maximise current investments in technology, provide a workable transition path to targeted technologies, maintain flexibility, enhance interoperability and sharing, and to promote fair competition.

## Approach

A systematic approach was taken to develop cohesive principles to guide the architecture of the ICT requirements for National Infrastructure Platform Services.



Principles that are in force at National, regional and local levels across multiple dimensions have been aligned. Principle dimensions of Business, Information, Management, Industry trends, Security and Testing have been added.

## Definition of Terms

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This section of the document provides a definition of terms used within this, and other, documentation related to Platform architecture principles. A consistent definition of terms (vocabulary) is critical and is defined as a key architecture principle.

**Enterprise** refers to the New Zealand Public Health Sector in its entirety. In this context, “Enterprise” includes DHB’s HBL, HealthBase and other sector participants.

**Organisation** refers to a single entity or a defined portion of an entity (such as a department or facility). The distinction between ‘Enterprise’ and ‘Organisation’ is intended to support architecture principles as a collaborative framework and both traditional and federated business models.

**Enterprise Architecture** is defined as “the description of the current and/or future structure and behaviour of the enterprise’s processes, information systems, personnel and organisations, aligned with the Enterprise’s core goals and strategic direction. Although often associated strictly with information technology, it relates more broadly to the practice of business optimisation in that it addresses business architecture, performance management, organisational structure and process architecture as well.”

**Architecture Principles** define the underlying general rules and guidelines for the use and deployment of all information technology resources and assets across the Enterprise. They reflect a level of consensus among the various elements of the Enterprise, and form the basis for making future IT decisions.

**Key Architecture Principles** are those architecture principles which apply across the Enterprise and all domains. Domain specific principles are defined within other Sector architecture principles to complement the key architecture principles.

## Principle Structure Definition and Effectiveness Criteria

### Principle Structure Definition

National Infrastructure Platform Services architecture principles are based on The Open Group Architecture Framework (TOGAF).

The following is the recommended (TOGAF) structure for the definition of architecture principles, and is the form that all principles in this document take.

<b>Name</b>	Should both represent the essence of the principle as well as be easy to remember. No prescriptive references (e.g. technology names) should be included in the principle name.
<b>Statement</b>	Should succinctly and unambiguously communicate the fundamental rule. For the most part, the principles statements for managing information are similar from one organisation to the next. It is vital that the principles statement be unambiguous.
<b>Rationale</b>	Should highlight the business benefits of adhering to the principle, using business terminology. Point to the similarity of information and technology principles to the principles governing business operations. Also describe the relationship to other principles, and the intentions regarding a balanced interpretation.
<b>Implications</b>	Should highlight the requirements, both for the business and IT, for carrying out the principle - in terms of resources, costs, and activities/tasks. It will often be apparent that current systems, standards, or practices would be incongruent with the principle upon adoption. The impact to the business and consequences of adopting a principle should be clearly stated. The reader should readily discern the answer to: "How does this affect me?" It is important not to oversimplify, trivialise, or judge the merit of the impact. Some of the implications will be identified as potential impacts only, and may be speculative rather than fully analysed.

## Principle Effectiveness Criteria

There are five (5) criteria that distinguish effective principles:

<b>Understandable</b>	The intentions of the principles are clear and unambiguous so that violations, whether intentional or not, are minimised. The underlying tenets of the principles can be quickly grasped and understood by individuals throughout the enterprise.
<b>Robust</b>	Enforceable policies and standards can be created from the principles. Each set of principles should be sufficiently definitive and precise for deciding a wide range of potentially controversial situations.
<b>Complete</b>	Every potentially important principle governing the management of information and technology for the enterprise has been defined, albeit at a high level. The principles are applicable to every perceived situation.
<b>Consistent</b>	Every word in a principle statement should be carefully chosen to ensure consistent interpretation. There may be times, however, when strict adherence to one principle may require a loose interpretation of another principle. There must be a balance of interpretations of the principles. Principles should not be contradictory to the point where adhering to one principle would violate the spirit of another.
<b>Stable</b>	Principles should have a "timeless" quality about them, and be able to transcend all foreseeable changes that could occur. The principles for information and technology management need not be changed to keep pace with technology advances.

Over and above these criteria, it is essential that principles are widely and clearly communicated across the enterprise.

Ideally, the spirit the principles represented should become part of the 'foundation for execution' within the Health Sector. Foundation for execution relates to the automation of routine business functions.

This allows the business to concentrate on innovation rather spending money on resources to simply maintain business as usual operations.

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## Grouping of Principles

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Best Practice recommends limiting of the number of principles so as not to overwhelm the person trying to understand them. A general rule is to keep it to 20 or less. This number will be higher if developing a reference architecture that is enterprise wide.

This document deals with the grouping of Principles in the following manner:

- The National Enterprise Architecture for Government; Federated Enterprise Architecture (FEA) Principles is used to create the master group structure. This produces the following Principle Groups:
  - Trust
  - Sovereignty
  - Asset
  - Accessibility
  - Consistency
  - Agility
  - User-Centric
  - Harm-minimisation
  - Value for money
- A final group, Additional Principles is used to capture principles that fall outside of these 7 principle Groups.

Additionally, it is clear that there are some natural groupings that re-occur and it makes sense to align these into their individual groups. Principles from the following groups have been aligned to the above groups to produce the National Infrastructure Platform Services Architecture Principles.

- General Architecture (Healthbase)
- E-Health
- Interoperability Architecture (Healthbase)
- Network
- Business
- Technology
- Information/data
- Management
- Industry trends
- Security
- Testing

The HealthBase and e-Health Principles as well as the natural groupings are mapped to the above, to avoid duplication and to provide traceability and establish hierarchy of the Platform Principles.

The above Principles are only described in this document at the Name and Statement level.

## Principles Summary

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### FEA Summary

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This table provides a summary of the all of government FEA architecture principles that provide input to the NIPS Principles.

Principle	Name	Statement
1	Trust	Trust in government will be strengthened.
2	Sovereignty	New Zealand's sovereignty and national identity will be supported and maintained
3	Asset	Information will be recognised as an asset that has value to the government and will be managed accordingly.
4	Accessibility	Information and services will be made available easily, widely and equitably for the benefit of the people of New Zealand.
5	Consistency	A common-and-consistent approach will be followed.
6	Agility	Approaches that increase agility will be adopted
7	User-centric	Services and processes will be designed from the perspective of the service user.
8	Harm-minimisation	Harmful effects of change will be minimised.
9	Value-for-money	Decisions will be made to provide optimal benefit to the government as a whole

## General Architecture (HealthBase) Principle Summary

This table provides a summary of the HealthBase architecture principles that provide input to the NIPS architecture principles.

Principle	Name	Statement
1	Primacy of principles	The principles apply to all organisations, and in turn to all individuals, within the Health Sector.
2	Requirements based change aligned with architecture	Information systems changes are made only in response to clear and agreed business change requirements and must be aligned with Health Sector architecture.
3	Controlled diversity	Diversity should be controlled to minimise the non-trivial cost of maintaining expertise in, and connectivity between, multiple operating environments.
4	Maximising benefit to the Health Sector	Information management decisions are made to provide maximum benefit to the Health Sector as a whole, driven by business strategies and aligned with Health Sector architecture.
5	Reuse of capabilities	The reuse of suitable existing capabilities already in place, within the Health Sector, is mandated over the development or acquisition of similar or duplicative capabilities.
6	Common vocabulary	Terminology is defined consistently throughout the Health Sector, and the definitions are well communicated, understandable and used.
7	Systems responsibility and ownership	Business owners are responsible for owning and governing their information technology processes and systems.
8	Information is an asset	Information must be managed as an asset; the underlying data must be of high quality being accurate, complete, timely, relevant and available to enable sound decision making and service delivery.
9	Platform and delivery channel independence	Systems are to be independent of specific technology choices and therefore can operate on a variety of organisational and technology platforms.
10	Business continuity	The information management environment will be continually monitored, maintained, upgraded as appropriate to ensure its on-going capability to meet the Health Sectors operational and strategic needs.
11	Compliance	Information systems and processes must comply with all relevant laws, policies, guidelines and regulations.
12	Information security	Information assets must be protected from unauthorised disclosure, destruction and intentional or accidental alteration.
13	Total cost and value of ownership	The cost and value (benefits) of ownership need to be evaluated across the entire expected lifespan of a system and in the context of the wider Health Sector.
14	Strategic use of relationships	The Health Sector will leverage strategic relationships between organisations and with other organisations and vendors to facilitate the development and evolution of capabilities.
15	Simplicity	The information technology systems should be kept as simple as possible whilst still meeting the requirements of the business and Health Sector. Where complexity is needed, it should be encapsulated to promote simplicity.

## e-Health Principle Summary

This table provides a summary of e-Health architecture principles that provide input to the NIPS Principles.

Principle	Name	Statement
1	Adhering to the Architecture Principles	NIPS will adhere to the Architecture Principles.
2	Solutions are based on the e-Health reference architecture	The e-Health reference architecture guides the design and delivery of all solutions.
3	The architecture supports the organisation structure	The target architecture supports the structure of NIPS and local variations in clinical and business priorities.
4	Agile architecture and solutions	NIPS implements agile architecture and solutions composed of reusable modular components and services, based on Service Oriented Architecture wherever possible.
5	Complying with standards	The architecture and solutions comply with relevant standards published within the e-Health standards library.
6	Leveraging existing national applications	NIPS architecture leverages maximum benefit from existing e-Health investments.
7	Information is governed	The architecture and solutions adhere to NIPS standards for information governance.
8	Information is accessible	Information is available and accessible to authorised individuals and groups across NIPS.
9	Information is secure	All information is secured against unauthorised access, modification or loss in accordance with NIPS information security policy.
10	Common vocabulary and data definitions	Data is defined consistently throughout NIPS, and the definitions are understandable and available to all users and systems.
11	Application usability and delivery	Consistency is applied to presentation mechanisms for delivering and presenting applications and information to end-users.
12	e-Health solutions will be cost efficient – 'Reuse over buy' and 'buy over build'	Where approved standard solutions and technology platforms exist in NIPS, they will be considered for reuse. Where they do not exist in NIPS, but are externally available either via open source or from software vendors, they will be selected. Only where NIPS requirements are substantially unique, or where specific constraints arise, will development be considered.
13	Controlling technology diversity	Technology diversity is controlled to minimise the cost of maintaining expertise in, and connectivity between, multiple platforms.
14	Critical services are maintained	The architecture is capable of supporting and maintaining critical business and clinical processes.
15	Compliance with Laws and Regulations	Solutions will comply with all relevant laws and regulations, and should be able to take account of changes to these.

## Interoperability Principle Summary

This table provides a summary of Interoperability architecture principles that provide input to the NIPS Principles.

Principle	Name	Statement
1	Align to national strategy	The Reference Architecture will align with national standards and business strategies, with priorities defined by national and regional IT plans
2	Invest in Information	We will represent health data for exchange as detailed clinical models that can be represented in different ways independently of any particular information model or serialized representation (structure) and derived directly from business requirements with clinical input. These models may be represented in different ways for different audiences.
3	Use single content mode	Information for exchange will be defined and represented in a single consistent way at the information model level. Where possible, it will align with national and international standards.
4	Work with sector	The development of the Reference Architecture will be in partnership with the sector as represented core groups including: Clinical leadership group, Sector Architecture Group, HISO, National Health IT Board, vendors, PHO, consumer groups and other affected agencies
5	Align to business needs	Development of the details of the Reference Architecture will be in conjunction with the prioritized business projects. Prioritization will be set by IT plans embodying those needs. The intent is to ensure clinical and other business engagement.
6	Use proven standards	Where there is a relevant national or international standard that is compliant with the overall direction of the Reference Architecture, will meet a particular business/technology requirement and is widely used, we will use that standard. If modifications are required, we will work with the relevant SDO to make the modifications. This approach applies at all levels of the interoperability stack including workflow, payload, security, terminology and transport.
7	Adopt services approach	To define the behavioural aspects of interoperability we will use a services approach, where a service can be thought of as a method of encapsulating business functionality behind a clearly defined interface that is technology agnostic and conforms to accepted practices.



## Network Principle Summary

This table provides a summary of global network architecture principles that provide input to the Network Domain Principles.

The majority of these principles align closely with other relevant principles and are already incorporated in various domain principles.

Principle	Name	Statement
1	Simplicity	Networks provide the infrastructure to support agency business and administrative processes.
2	Functional Adequacy	The architecture should meet the basic client service objectives without imposing additional qualifications or constraints.
3	Reliability	Networks must be operational, reliable, and available (24x7x365) for essential business processes and mission-critical business operations.
4	Scalability	Networks must be designed for growth, flexibility, and adaptability.
5	Controlled diversity	Networks must use industry-proven, mainstream technologies based on industry-wide, open standards, and open architecture.
6	Security	Networks must be designed with confidentiality and security of data as a high priority.
7	Access	Network access must be a function of authentication and authorization, not of location.
8	Convergence	Networks should be designed to support converged services while accommodating traditional data, voice, and video services and to be "application aware" in the delivery of business-critical application systems.
9	Affordability	Affordability is perhaps implied within any architecture, but it is explicitly stated here simply to note that any network architecture which is not affordable within available resources will never be implemented.
10	Implementable today	Technical feasibility is also a principle which is effectively implied within any architecture, but again it is perhaps worth explicitly noting within the set of architectural principles, that if a network architecture relies on technologies which cannot be purchased and deployed today, then the architecture cannot be used as the basis of subsequent implementation engineering, and accordingly such an architecture specification is functionally irrelevant for any other purpose than a vision statement of potential future service objectives.
11	Designed to meet actual end client requirements	Networks are service structures, and the architecture of a network should accordingly be designed to meet actual end client needs, rather than impose additional constraints and conditions on the client base. This implies that a network should provide service to the end user application services and protocols which are being deployed by the user base, rather than implement a service environment which forces clients to deploy new services and protocols.
12	Application Response Times	The single NIH network will provide application response times acceptable to support the business need, and cost effective bandwidth to satisfy the current and future networking needs of NIH users and external partners.
13	Network Connectivity	The network will provide high-quality, reliable, scalable and measurable network connectivity to all sites. All mission critical sites will be engineered with fault tolerance.
14	Service Level Agreements ( SLA )	The network will meet the network service level objectives agreed upon by IT management and NIH users and external partners. The network management systems will have the capability to measure and report end-to-end network service level statistics.
15	Open System Standards	Open system standards should be used for communication both within the Health Sector and with suppliers and clients. Standard network interfaces and protocols will be defined, maintained and implemented.
16	Remote Access	The remote access network will consist of a defined set of technical options for the delivery of reliable, cost-effective, secure and ubiquitous remote access capabilities.

## Business Architecture Principles Summary

The following represents the Business architecture principles that provide input to the NIPS Principles.

Principle	Name	Statement
1	Speed and quality	Architectural decisions will be made with an emphasis on accelerating time to delivery for solutions, while still maintaining quality.
2	Flexibility	The IT architecture will incorporate flexibility to support changing business needs and enable evolution of the architecture and the solutions built upon it.
3	Technology risk	Stability of business systems will be preserved through controlled usage and management of technology across its life cycle.
4	Integrated solutions	The IT architecture will support the delivery of business solutions composed of integrated application and infrastructure components.
5	Alignment of IT to business	The IT architecture will be aligned with the business vision, objectives, and strategies and will support the business operations.
6	Strategic use of relationships	The IT architecture will leverage strategic relationships with other businesses and vendors to facilitate building and evolution of the IT architecture.
7	Optimise IT infrastructure	The IT infrastructure will be optimised based on business requirements and technology capabilities.

## Technology Principle Summary

This table provides a summary of Technology architecture principles that provide input to the NIPS Principles.

Principle	Name	Statement
1	Innovative and agile	The IT architecture will readily support incorporation of new technologies to support business and technology innovation.
2	Technology- and vendor-independence	The IT architecture will be designed to reduce the impact of technology changes on the business, as well as be resilient to change.

## Information / Data Principle Summary

This table provides a summary of Information /Data architecture principles that provide input to the NIPS Principles.

Principle	Name	Statement
1	Data is an Asset	Data is an asset that has value to the Health Sector and is managed accordingly.
2	Data is Shared	Users have access to the data necessary to perform their duties; therefore, data is shared across Health Sector functions and organisations.
3	Common Vocabulary and Data Definitions	Data is defined consistently throughout the Health Sector, and the definitions are understandable and available to all users.
4	Data Security	Data is protected from unauthorised use and disclosure. In addition to the traditional aspects of national security classification, this includes, but is not limited to, protection of pre-decisional, sensitive, source selection-sensitive, and proprietary information.
5	Responsive Change Management	Changes to the Health Sector information environment are implemented in a timely manner.
6	Interoperability	Software and hardware should conform to defined standards that promote interoperability for data, applications, and technology.

## Management Principle Summary

This table provides a summary of Management architecture principles that provide input to the NIPS Principles.

Principle	Name	Statement
1	General governance	Compliance to and evolution of the architecture will be managed through controlled governance processes.
2	Cost performance	The IT architecture will be managed to ensure the cost effectiveness of the information and technology environment.
3	Applications and infrastructure components	These elements will be designed and implemented to facilitate monitoring and measurement.
4	Service Level management	The IT architecture will support operation of business processes as defined by Service Level management and agreements.

## Industry Trend Principle Summary

This table provides a summary of Industry Trend architecture principles that provide input to the NIPS Principles.

Principle	Name	Statement
1	Open standards	The IT architecture will use open industry standards.
2	Leverage industry knowledge	The IT architecture will leverage industry best practices.
3	Service Oriented	The IT architecture and components built upon it should be viewed as a set of independent services that can be composed to provide a solution.
4	Separation of concerns	The IT architecture will support clearly defined, well partitioned, and loosely coupled components, processes, and roles.
5	Reuse	Common components in the IT architecture should be used while balancing application and Health Sector requirements.

## Security Principle Summary

Principle	Name	Statement
1	Defence in depth	Greater security will be obtained by layering defences.
2	Managed risk	Risk and security controls should be balanced according to business objectives - security controls should be proportionate to risk.
3	Security by design	Security should not be an afterthought nor an add-on. Security considerations should begin with the requirements phase of development and be treated as an integral part of the overall system design.
4	Role based access	A user (human or computer) should only be given enough privileges to do those tasks needed to perform a specified job activity, function, or task; no more, no less.
5	Transparency	Security should be user transparent and not cause users undue extra effort. Administration and configuration of security components should not be overly complex, arduous or obscure.
6	Resilience in response	Design and operate IT systems to limit vulnerability and to be resilient in response.
7	Enforced policy	Implement processes, procedures, and systems that promote enforcement of organisational security policies.

## Testing Principle Summary

Principle	Name	Statement
1	Testability	IT architecture should be designed for testing. Test environments will provide simulation of the production environment to a degree appropriate for the level and type of testing.

## Key Architecture Principles

This table provides a summary of the overarching architecture principles that apply to NIPS.

Principle	Name	Statement
1	Secure by design	The architecture shall ensure security considerations are commenced from the requirements phase of development and are treated as an integral part of the overall system architecture.
2	Accessibility	The architecture shall provide users the necessary role based access to systems and data to perform their duties, function or task but shall have no other access
3	Reuse of Capabilities	The architecture shall ensure the reuse of suitable existing capabilities, within the Health Sector. Reuse is mandated over the development or acquisition of duplicative capabilities.
4	Performance and Functionality	The architecture shall ensure that the level of functionality is appropriate for the purpose that is being attained and shall provide sufficient capacity to allow the supported systems to perform as required.
5	Simplicity	The architecture shall be kept as simple as possible whilst still meeting the requirements of the business.
6	Innovative and Agile	The architecture will be innovative and agile, and shall support the incorporation of new technologies to support business and technology innovation. Architectures that increase agility & scalability shall be preferred.
7	Compliance	The architecture shall ensure information systems and processes comply with all relevant laws, policies, standards, guidelines and regulations.
8	Supportability	The architecture shall be supportable individually and as a whole.
9	Mobility	The architecture shall provide secure access to the required data and applications regardless of location or device.
10	Support for Changing Requirements	The architecture shall provide for the evolution of immediate and long term requirements.
11	Sustainable	The architecture will endorse and encourage the adoption of solutions that are designed to reduce waste and minimise the use of resources
12	User-centric	The architecture shall recognise the importance of the user, so that services and processes are effective and efficient both for the user and the system.
13	Testability	The architecture shall be designed to allow testing by simulation of the production environment to a degree appropriate for the level and type of testing.
14	Affordability	Affordability both in Capital and Operating Expenditure is a requirement of all projects and initiatives, and a core requirement for the Sector
15	Open Standards	The architecture shall provide for open standards where appropriate.

## Architecture Principles Defined

The following represents the key architecture principles. The principles are provided in the order given in the Principles Summary section (above).

More specific, domain based, principles will be defined as part of specific development exercises however this section represents the set of over-arching architecture principles which apply across the sector.

### Secure by Design

Name	Secure by Design
Statement	The architecture shall ensure security considerations are commenced from the requirements phase of development and are treated as an integral part of the overall system architecture.
Rationale	The architecture will deliver the required functionality without imposing unacceptable risk on any part of the organisation. The architecture shall be sufficiently flexible to accommodate future legislative restraints and the increased need to exchange information with other providers. The architecture shall be designed with privacy and security of data as a core component.
Implications	All architecture elements introduced by the architecture will be secure by design. The architecture will ensure that the technical configurations and measures are in place to enforce compliance to NIPS information security policy. The architecture shall ensure that such configurations and measures are in proportion to the level of security risk. NIPS Health Sector security standards will need to be reviewed periodically to ensure they continue to be appropriate and may accommodate new and emerging environments.

### Accessibility

Name	Accessibility
Statement	The architecture shall provide users the necessary access to systems and data to perform their duties, function or task but shall have no other access.
Rationale	Appropriate access to information leads to efficiency and effectiveness in decision-making and affords timely response to service delivery.
Implications	An education process is required to ensure users' understand the implications of the access they have and how to protect it. Accessibility involves the ease with which users obtain access to appropriate information. To provide appropriate access to information and resources in an organisation the size of NIPS, identity management and access allocation methods need to be fully automated.

### Reuse of Capabilities

Name	Reuse of Capabilities
Statement	The architecture shall ensure the reuse of suitable existing capabilities, within the Health Sector. Reuse is mandated over the development or acquisition of duplicative capabilities.
Rationale	The provision of duplicative capability is expensive where it proliferates information duplication without appropriate justification. This introduces not only additional cost but also significant risk to the Health Sector.
Implications	Business units which depend on existing capability that may be provided by an equivalent Health Sector-wide capability shall be subject to a review process to determine if the rationale for the individual capability remains. This review may be undertaken whenever new funding is requested. New funding requests from business units shall be reviewed to ensure that existing infrastructure is utilised most effectively. Scarce resources will be deployed appropriately.

## Performance and Functionality

Name	Performance and Functionality
Statement	The architecture shall ensure that the level of functionality is appropriate for the purpose that is being attained and shall provide sufficient capacity to allow the supported systems to perform as required.
Rationale	All systems that are running on the platform will have their own resource requirements. The solution must have enough capacity to meet these requirements as well as allowing for growth and peaks.
Implications	<p>The architecture will attain the client service objectives without imposing additional qualifications or constraints.</p> <p>The requirements of the delivered services need to be clearly understood during the design phase.</p> <p>Unknown growth implications can be mitigated by designing a scalable platform.</p> <p>Highly sophisticated monitoring will be essential to ensuring the required performance and capacity is maintained and can be reported on.</p> <p>Actual performance metrics need to be defined so that they can be measured.</p>

## Simplicity

Name	Simplicity
Statement	The architecture shall be kept as simple as possible whilst still meeting the requirements of the business.
Rationale	<p>A simple architecture has been shown to often have the lowest lifetime cost of ownership.</p> <p>Complex process and solutions often result in the introduction of unnecessary costs and risks. The reduction of this complexity makes the Health Sector more dynamic.</p>
Implications	<p>The preferred option will be the solution to the business requirement which is the most simple.</p> <p>Solutions which rely on specialised skills or knowledge, which do not exist widely within the Health Sector may be seen as undesirable.</p>

## Innovative and Agile

Name	Innovative and Agile
Statement	The architecture will be innovative and agile, and shall support the incorporation of new technologies to support business and technology innovation. Architectures that increase agility & scalability shall be preferred.
Rationale	NIPS operates in an environment of considerable change and complexity with increasing expectations from the business for better performance, responsiveness and the use of innovative solutions.
Implications	<p>The architecture must be robust enough to be changed and extended over time.</p> <p>The architecture may allow individual business units to innovate safely in their pursuit of clinical advantage as a component of the integrated IT strategy of the Health Sector.</p> <p>There will be cases where users will have access to newer technologies within different areas of the Health Sector. The architecture should ensure backward compatibility and considerations around training.</p> <p>Creating flexible, adaptable and scalable systems maybe slower and more expensive than creating specific or rigid systems.</p> <p>The architecture shall incorporate agility in designing and integrating applications / processes.</p> <p>The agility may be obtained through a collection of shared business services provided by modular pieces of the architecture.</p>

## Compliance

Name	Compliance
Statement	The architecture shall ensure information systems and processes comply with all relevant laws, policies, standards, guidelines and regulations.
Rationale	The Health Sector policy is to abide by relevant laws, policies, guidelines and regulations. This principle should not preclude business process improvements which result in changes to policies and regulations.
Implications	NIPS will be compliant with relevant laws, regulations, and external policies regarding the collection,

	<p>retention, and management of data.</p> <p>All relevant laws, policies and regulatory information need to be clearly communicated across the Health Sector.</p> <p>Mechanisms for confirming compliance need to be put in place to allow changes in the compliance requirements that may drive changes in processes and/or applications.</p>
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## Supportability

Name	Supportability
Statement	The architecture shall be supportable individually and as a whole.
Rationale	Supportability is required to ensure services can be delivered without interruption and to keep the costs of maintaining the platform down.
Implications	<p>The solution must be capable of supporting the business needs for the next 4 years.</p> <p>Roadmaps for each of the components must be known to ensure support is available for at least 4 years.</p> <p>Support levels for each of the components must be known along with the cost and method of support.</p>

## Mobility

Name	Mobility
Statement	The architecture shall provide secure access to the required data and applications regardless of location or device.
Rationale	Users can work more effectively if they can get access to the information they require when they need it. This in turn has the potential to benefit the quality of healthcare / education that can be provided.
Implications	<p>There will be implications in the services that can be delivered to certain form factor devices purely because of physical constraints.</p> <p>The implementation of endpoint analysis must be in-place before any non-controlled devices can be used in everyday scenarios.</p> <p>Mobility always increases the security considerations of the solution.</p>

## Support for Changing Requirements

Name	Support for Changing Requirements
Statement	The architecture shall provide for the evolution of immediate and long term requirements.
Rationale	To enable an architecture that can accommodate the changing needs of the organisation, the future vision must be continually adapted to meet evolving demand.
Implications	<p>The future vision must be embraced by all stakeholders and become part of the Information Services Strategic Plan to ensure it is realised and enhanced.</p> <p>Continuous testing and measuring of the vision against active programmes of work will ensure the future vision is being realised.</p>

## Sustainable

Name	Sustainable
Statement	The architecture will endorse and encourage the adoption of solutions that are designed to reduce waste and minimise the use of resources
Rationale	Technology is available to reduce cost and waste. There is a public benefit obligation to take advantage of this technology to produce a responsible outcome.
Implications	<p>Additional resources may be required to enable these functions.</p> <p>In some instances there may be requirements for additional infrastructure to support these technologies. For example, proximity printing may require ID badges if swiping for print jobs is being implemented.</p>



## User-centric

Name	User-centric
Statement	The architecture shall recognise the importance of the user, so that services and processes are effective and efficient both for the user and the system.
Rationale	The architecture should ensure users are able to access all of the systems and information they require, regardless of the underlying solution that delivers them. Access to systems should be seamless from a user's point of view.
Implications	Users accessing services want to be able to do so regardless of existing institutional and role boundaries. A challenge for the system as a whole is to link together access to information, retention of information and provisioning of services, in such a way to maximise timeliness and benefit to the user.

## Testability

Name	Testability
Statement	The architecture shall be designed to allow testing by simulation of the production environment to a degree appropriate for the level and type of testing.
Rationale	The architecture should not preclude simulating the production environment due to cost or complexity. The architecture should support test efforts that are able to work independently, without excessive coordination or scheduling.
Implications	The only way to get assurance that a change will be successful is to test the change in a suitable test environment. The test system requirements for each system will need to be defined based on their criticality, risk, architecture and the components that need to be tested. Lower priority test environments may need to be created based on demand rather than having a test environment on standby all of the time. Lower priority test environments may be accommodated on lower cost / availability systems.

## Affordability

Name	Affordability
Statement	The architecture shall provide for affordability both immediately and in the long term. Economies of scale are to be used to provide overall savings in the long term.
Rationale	Affordability both in Capital and Operating Expenditure is a requirement of all projects and initiatives, and a core requirement for the Sector
Implications	Business case approval must be gained before project start. Lifecycle costs are to be assessed prior to any investment

## Open Standards

Name	Open Standards
Statement	The architecture shall provide for open standards where appropriate.
Rationale	Open Standards encourage interoperability and competition
Implications	Open standards are preferred where appropriate.