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NHS STU3 Capability Statement Profile Design

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Revision History

Version	Date	Summary of Changes
0.1	2017-09-19	Initial comments
0.2	2017-10-03	P14 Review comments
0.3	2017-12-13	Multiple 'capabilitystatement-expectation' extensions added to represent complete REST conformance context.
0.4	2018-01-02	HL7 'capabilitystatement-expectation' replaced by 'Extension- CapabilityStatement-Expectation-1' extension.

Reviewers

This document must be reviewed by the following people:

Reviewer name	Title / Responsibility	Date	Version
Richard Kavanagh	Head of Interoperability Standards Development		0.1
Programme 14 – Interoperability & Architecture			0.2

Approved by

This document must be approved by the following people:

Name	Signature	Title	Date	Version

Glossary of Terms

Term / Abbreviation	What it stands for

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1. Introduction

1.1. Purpose of Document

This document defines the best practice rules that must be followed by technical and interoperability architects when profiling NHS Digital national FHIR Capability Statements.

It is published as a 'work in progress' version and as such is subject to change.

It has been published to show the direction of travel and to serve as a discussion document for parties involved in the creation of NHS Digital national API Capability Statements and how these Capability Statements will be used in national NHS FHIR API Implementation Guides.

1.2. Background

The conformance layer¹ is used within FHIR implementation guides to provide a computable statement about how FHIR resources and FHIR exchange paradigms are used to solve particular healthcare interoperability use cases. The conformance layer is implemented using a number of key resources including StructureDefinition, CapabilityStatement and ImplementationGuide.

This document is only concerned with profiling the STU3 CapabilityStatement resource.

The long term objective of this document is to ensure a consistency in design of NHS Digital Capability Statements for use within NHS Digital FHIR API Implementation Guides.

1.3. In Scope

For this version of the NHS STU3 Capability Statement Profile Design the following is considered in scope:

- NHS Digital FHIR API projects delivered on Spine
- Capability Statement resource Metadata
- FHIR RESTful mode
- FHIR query mechanism

1.4. Out of Scope

For this version of the NHS STU3 Capability Statement Profile Design out of scope items include:

- Peer to Peer FHIR API projects e.g. CareConnect API
- Capability Statement elements:
 - CapabilityStatement.rest.mode 'Client'
 - o CapabilityStatement.rest.interaction
 - o CapabilityStatement.rest.operation
 - CapabilityStatement.rest.compartment
 - CapablityStatement.messaging
 - CapabilityStatement.document

¹ http://hI7.org/fhir/STU3/profiling.html

1.5. Target Audience

This document is intended for NHS Digital technical teams involved in the development of FHIR API Implementation Guides using the STU3 FHIR standard.

It is assumed that the reader is familiar with the FHIR standard and all of technologies detailed within this document.

1.6. References

#	Name	Version
1	https://nhsconnect.github.io/fhir-policy/index.html	1.2.0-alpha
2	http://hl7.org/fhir/STU3/capabilitystatement.html	FHIR Release 3 (STU)

2. CapabilityStatement

A FHIR STU3 Capability Statement documents a set of capabilities (behaviours) of a FHIR Server that may be used as a statement of actual server functionality or a statement of required or desired server implementation. The context of FHIR Server capability MUST not be confused with technical architecture solution capability.

2.1. Design Principles

A Capability Statement is a key part of the FHIR conformance framework. It is used as a statement of actual software capability features or as a set of conformance rules that a system should adhere to.

For NHS Digital there are 2 'relevant' ways to profile the Capability Statement:

- 1. A specification of 'requirements' profile describes a desired solution
- 2. An implementation 'instance' profile describes an actual implementation
 - **NOTE** An 'instance' profile is a statement of conformance to a 'requirements' profile.

FHIR restful solutions are expected to make available an 'instance' profile on invocation of the capabilities operation. It is also the type of statement that forms a basis for the testing, certification or commissioning of specific software installations.

The Capability Statement profile detailed in this section applies to all NHS Digital FHIR API development projects delivered on Spine. The only way to provide consistent and standard

FHIR API Definitions is if all FHIR API Implementation Guides abide by these common Capability Statement design principles.

2.2. NHSDigital-CapabilityStatement-1 Profile Design

The following table shows the NHSDigital-CapabilityStatement-1 StructureDefinition profile, which constrains the CapabilityStatement resource. Constraints applied to the CapabilityStatement base resource by this profile are shown in bold.

For some CapabilityStatement elements, the comments column details the expected 'instance' statement of conformance to a 'requirements' profile.

Name	Card.	Description & Constraints	Comments
CapabilityStatement		A statement of system capabilities	
CapabilityStatement.url	1 1	URL that is used to identify this capability statement when it is	This version of the profile requires a URL element.
		design or an instance. MUST be globally unique, and MUST	FHIR-CONF-01: All FHIR ReST endpoints MUST publish their conformance
		be an address at which this capability statement is (or will be) published. The URL MAY [TBC] include the	FHIR-VER-02: HL7 FHIR version in FHIR Endpoint URL
		major version of the capability statement.	FHIR-VER-04: Major Profile Version in Resource ID
			Capability statements of kind 'requirements' example [TBC]:
			https://fhir.nhs.uk/STU3/Capab ilityStatement/ODSAPI- CapabilityStatement-1
			Capability statements of kind 'instance' example [TBC]:
			https://directory.spineservices. nhs.uk /STU3/SpineDirectory- CapabilityStatement-1
CapabilityStatement.version	01	The identifier that is used to identify this version of the capability statement when it is referenced in a	FHIR-VER-05: Minor and Patch Profile Version will use FHIR versioning
		specification, model, design or instance.	The version element within the
		NB: This is a business versionId, not a resource version id.	resource will contain the full semantic version of the resource, and will look like this:
			<version value="1.1.3"></version>
CapabilityStatement.name	1 1	Name for this capability statement (computer friendly)	This version of the profile requires a name element.
			FHIR-VER-04: Major Profile Version in Resource ID
			FHIR-NAME-01: FHIR Profile names MUST follow an agreed format
			National NHS Digital capability statements MUST support the

			naming conventions for nationally defined FHIR profiles. Refer to: • https://nhsconnect.githu
			b.io/fhir- policy/naming.html
CapabilityStatement.title	01	Name for this capability statement (human friendly)	
CapabilityStatement.status	11	draft active retired unknown PublicationStatus (Required)	For all under development CapabilityStatement profiles the status MUST be 'draft'.
CapabilityStatement.experimental	01	For testing purposes, not real usage	
CapabilityStatement.date	11	Date this was last changed	
CapabilityStatement.publisher	1 1	Name of the publisher (organization or individual)	This version of the profile requires a publisher element.
			National Spine capability statements MUST populate this element with 'NHS Digital'.
CapabilityStatement.contact	1*	Contact details for the publisher	This version of the profile requires a contact details element.
CapabilityStatement.contact.name	11	Name of a service that would provide first line support.	This version of the profile requires a contact name element. National capability statements of kind 'requirements' MUST populate this element with 'Interoperability Team'. Capability statements of kind 'instance' SHOULD populate this element with relevant service desk details.
CapabilityStatement.contact.teleco m	1*	Contact details of the service	This version of the profile requires at least one telecom element. Capability statements of kind 'requirements' MUST populate the telecom child elements as follows: System: email Value: interoperabilityteam@nhs.net Use: work Capability statements of kind 'instance' MUST populate the telecom child elements with relevant service desk contact details.
CapabilityStatement.description	01	Natural language description of the capability statement	Capability statements of kind 'requirements' MUST support

			the description element.
			The description of the capability statement will be described and published within the NHS Digital Jekyll API Implementation Guide publication.
CapabilityStatement.useContext	0*	Context the content is intended to support	
CapabilityStatement.jurisdiction	0 *	Intended jurisdiction for capability statement (if applicable)	
		Jurisdiction ValueSet (Extensible)	
CapabilityStatement.purpose	01	Why this capability statement is defined	
CapabilityStatement.copyright	11	Use and/or publishing restrictions	All NHS Digital national capability statements of kind 'requirements' and server 'instances' MUST support the copyright element.
			Example:
			Copyright © 2017 NHS Digital.
CapabilityStatement.kind	11	instance capability requirements	The 'requirements' code MUST
		CapabilityStatementKind (Required)	be used for all capability statements profiles defined by national API IGs - it sets out what systems should do rather than what a particular system does do.
			A server implementation MUST use the code 'instance'. It describes what a particular system does do.
CapabilityStatement.instantiates	0 *	Canonical URL of another capability statement this implements	A server 'instance' of a national Capability Statement MUST reference the 'requirements' CapabilityStatement. [TBC]
CapabilityStatement.software	01	Software that is covered by this capability statement	cpb-2: Capability statements of kind 'requirements' do not have software or implementation elements.
CapabilityStatement.implementatio n	01	If this describes a specific instance	cpb-2: Capability statements of kind 'requirements' do not have software or implementation elements.
CapabilityStatement.fhirversion	11	FHIR Version the system uses	STU3 Capability Statements MUST support "3.0.1".
CapabilityStatement.acceptUnknow n	11	no extensions elements both UnknownContentCode (Required)	For this version of the profile both national 'requirements' profiles and server 'instance' profiles MUST use the code 'no'.
CapabilityStatement.format	1 *	formats supported (xml json ttl mime type)	National REST APIs MUST support one of JSON, XML or both formats.

		MimeType (Required)	This element MUST be populated to meet this requirement.
			Spine mime-type conformance:
			 Spine SHALL support the formal mime-type for STU3 XML + JSON FHIR resources: 'application/fhir+xml' or 'application/fhir+json' Spine MAY support the formal mime-types for DSTU2 XML +JSON FHIR resources: 'application/xml+fhir' or 'application/json+fhir' Spine MAY support generic mime- types e.g. 'text/html', 'xml', 'text/xml', 'applicat ion/xml', 'json' and 'application/json' Spine SHOULD support the FHIR STU3 implementation note: https://www.hl7.org/fhir/http.html
CapabilityStatement.patchFormat	0 *	Patch formats supported	
		MimeType (Required)	
CapabilityStatement.Implementatio nGuide	0 *	Implementation guides supported	A national 'requirements' profile MUST link to the NHS Developer site for FINAL releases of national Implementation Guides.
			A server 'instance' MUST list the implementation guides that the server does (or should) support in their entirety.
			Publication URLs should be assigned before Implementation Guides released.
CapabilityStatement.profile	0 *	Profiles for use cases supported.	A national 'requirements' profile MAY specify a list of
		This could include:	profiles that represent
		ExtensionsData typesValueSets	required to be supported by a system.
			A server 'instance' MAY list all profiles that represent different use cases that are required to be supported by a system.
CapabilityStatement.profile.profil e-link	0*	'Extension-NHSDigital-Profile-Link- 1' extension.	The 'Extension-NHSDigital- Profile-Link-1' extension links
		A code that references a resource listed in CapabilityStatement.rest.resource.	profiles to the resources they are based upon for the purpose of 'describing' profile specific capabilities such as

			specific search criteria or operations which are supported on a profile by profile bases. The 'Extension-NHSDigital- Profile-Link-1' extension binds to the HL7 'resource-types' value set. This value set includes codes from the following code systems:
			http://hl7.org/fhir/resource- types
CapabilityStatement.rest	0 *	A definition of the restful capabilities of the solution.	MUST be supported for all national Spine RESTful APIs
		Multiple repetitions allow definition of both client and/or server behaviours.	
		+ A given resource can only be described once per RESTful mode.	
CapabilityStatement.rest.mode	11	client server	This version of the profile MUST support 'server' mode.
		Identifies whether this portion of the statement is describing the ability to initiate or receive restful operations.	The Client mode is out of scope for this version of the profile.
CapabilityStatement.rest.document ation	01	General description of implementation	
CapabilityStatement.rest.security	01	Information about security of implementation	
CapabilityStatement.rest.security.c ors	1 1	Adds CORS Headers (http://enable- cors.org/)	This version of the profile MUST support 'cors' Boolean element
		MUST Mandate boolean value. [TBC]	All National API FHIR servers SHOULD support CORS.
			CORS support is highly recommended - mandatory if using SMART on FHIR.
CapabilityStatement.rest.security.s ervice	0 *	OAuth SMART-on-FHIR NTLM Basic Kerberos Certificates	
		RestfulSecurityService (Extensible)	
CapabilityStatement.rest.security.d escription	01	General description of how security works	
CapabilityStatement.rest.security.c ertificate	0 *	Certificates associated with security profiles	
CapabilityStatement.rest.security.c	01	Mime type for certificates	
		MimeType (Required)	
CapabilityStatement.rest.security.c ertificate.blob	01	Actual certificate	
CapabilityStatement.rest.resource	0 *	Resource served on the REST interface Max of one repetition per resource type.	A national 'requirements' profile MUST specify the restful capabilities of the solution for a specific resource type.

			support all resources served on the REST interface.
CapabilityStatement.rest.resourc e.capabilitystatement-search- parameter-combination	0 *	CapabilityStatement resource search combinations MUST be specified using the HL7 maintained 'capabilityStatement-search- parameter-combination' common extension which is a container for a single allowable parameter combination. The extension supports required and optional parameter combinations. http://hI7.org/fhir/STU3/extension- capabilitystatement-search- parameter-combination.html	If a search combination is specified, clients should expect that they must submit that required combination or the search will be unsuccessful. If multiple search parameter combinations are specified, a client may pick between them, and supply the minimal required parameters for any of the combinations.
CapabilityStatement.rest.resource.t ype	11	A type of resource exposed via the restful interface e.g. CarePlan	
		ResourceType (Required)	
CapabilityStatement.rest.resource.p rofile	01	Base System profile for all uses of resource The profile applies to all resources of this type - i.e. it is the superset of what is supported by the system.	A national 'requirements' profile MUST specify the profile that describes the solution's overall support for the resource. A server 'instance' MUST support the profile that describes the solution's overall support for the resource.
CapabilityStatement.rest.resource.d ocumentation	01	Additional information about the use of the resource type	
CapabilityStatement.rest.resource.i nteraction	1*	What operations are supported?	
CapabilityStatement.rest.resourc e.interaction. capabilityStatementExpectation	01	FHIR endpoint conformance must be specified within the CapabilityStatement resource using the NHSDigital maintained 'Extension-CapabilityStatement- Expectation-1' extension. It defines the level of expectation	The 'Extension- CapabilityStatement- Expectation-1' extension is bound to the HL7 'conformance-expectation' value set. This value set defines the
		associated with a given system capability. https://fhir.nhs.uk/STU3/StructureDefi	following codes which must be used when publishing a FHIR capability statement:
		nition/Extension-CapabilityStatement- Expectation-1	http://hl7.org/fhir/STU3/valueset- conformance-expectation.html
CapabilityStatement.rest.resource.i nteraction.code	11	read vread update patch delete history-instance history-type create search-type TypeRestfulInteraction (Required)	A national 'requirements' profile MUST specify coded identifiers of the interaction codes supported by the national system.
			A server 'instance' MUST support coded identifiers of the interaction codes supported by the national system.
CapabilityStatement.rest.resource.i nteraction.documentation	01	Anything special about operation behaviour	

CapabilityStatement.rest.resource.v ersioning	01	no-version versioned versioned- update ResourceVersionPolicy (Required)	NHS Digital national REST API Capability Statements of kind 'requirements' and server 'instances' MAY support versioning for a resource type.
			If the capability statement does not explicitly support this field the default code = 'no- version'. This indicates that the server does not support versioning for a resource type.
CapabilityStatement.rest.resource.r eadHistory	01	Whether vRead can return past versions	NHS Digital national REST API Capability Statements of kind 'requirements' and server 'instances' MAY support returning past versions of a resource as part of the vRead operation.
			If the capability statement does not explicitly support this field the default flag = 'false'. This indicates that the server is NOT able to return past versions of the resource as part of the vRead operation.
CapabilityStatement.rest.resource.u pdateCreate	01	If update can commit to a new identity	NHS Digital national REST API Capability Statements of kind 'requirements' and server 'instances' MAY allow clients to create new identities on the server using the updateCreate operation for a resource type.
			If the capability statement does not explicitly support this field the default flag = 'false'. This indicates that the server does NOT allow clients to create new identities on the server.
CapabilityStatement.rest.resource.c onditionalCreate	01	If allows/uses conditional create	NHS Digital national REST API Capability Statements of kind 'requirements' and server 'instances' MAY support the conditionalCreate operation for a resource type.
			If the capability statement does not explicitly support this field the default flag = 'false'. This indicates that the server does NOT support conditional create.
CapabilityStatement.rest.resource.c onditionalRead	01	not-supported modified-since not- match full-support ConditionalReadStatus (Required)	NHS Digital national REST API Capability Statements of kind 'requirements' and server 'instances' MAY support the conditionalRead operation for a resource type.
			If the capability statement does not explicitly support this field the default code = 'not- supported'. This indicates that the server does not support conditional read for a resource

			type.
CapabilityStatement.rest.resource.c onditionalUpdate	01	If allows/uses conditional update	NHS Digital national REST API Capability Statements of kind 'requirements' and server 'instances' MAY support the conditionalUpdate operation for a resource type.
			If the capability statement does not explicitly support this field the default flag = 'false'. This indicates that the server does NOT support conditional update.
CapabilityStatement.rest.resource.c onditionalDelete	01	not-supported single multiple - how conditional delete is supported ConditionalDeleteStatus (Required)	NHS Digital national REST API Capability Statements of kind 'requirements' and server 'instances' MAY support the conditionalDelete operation for a resource type.
			If the capability statement does not explicitly support this field the default code = 'not- supported'. This indicates that the server does not support conditional delete for a resource type.
CapabilityStatement.rest.resource.r eferencePolicy	0 *	literal logical resolves enforced local	
		ReferenceHandlingPolicy (Required)	
CapabilityStatement.rest.resource.s earchInclude	0 *	_include values supported by the server	A national 'requirements' profile MUST specify the list of _include values supported by the system.
			A server 'instance' MUST support the list of _include values supported by the system.
CapabilityStatement.rest.resourc e.interaction. capabilityStatementExpectation	01	FHIR endpoint conformance must be specified within the CapabilityStatement resource using the NHSDigital maintained 'Extension-CapabilityStatement- Expectation-1' extension.	The 'Extension- CapabilityStatement- Expectation-1' extension is bound to the HL7 'conformance-expectation' value set.
		It defines the level of expectation associated with a given system capability.	This value set defines the following codes which must be used when publishing a FHIR capability statement:
		nition/Extension-CapabilityStatement- Expectation-1	http://hl7.org/fhir/STU3/valueset- conformance-expectation.html
CapabilityStatement.rest.resource.s earchRevInclude	0 *	_revinclude values supported by the server	A national 'requirements' profile MUST specify the list of _revinclude values supported by the system.
			A server 'instance' MUST support the list of _revinclude values supported by the system.
CapabilityStatement.rest.resourc e.interaction.	01	FHIR endpoint conformance must be specified within the	The 'Extension- CapabilityStatement-

	capabilityStatementExpectationC apabilityStatement.rest.resource. searchRevInclude. capabilitystatement-expectation		CapabilityStatement resource using the NHSDigital maintained 'Extension-CapabilityStatement- Expectation-1' extension.	Expectation-1' extension is bound to the HL7 'conformance-expectation' value set.
			It defines the level of expectation associated with a given system capability.	This value set defines the following codes which must be used when publishing a FHIR capability statement:
			https://fhir.nhs.uk/STU3/StructureDefinition/Extension-CapabilityStatement- Expectation-1	http://hl7.org/fhir/STU3/valueset- conformance-expectation.html
	CapabilityStatement.rest.resource.s earchParam	0 *	Search parameters supported by implementation	MUST reference either search parameters defined in the specification, or additional ones defined for/by the implementation.
				MAY reference search parameters for all resources or search result parameters.
	CapabilityStatement.rest.resourc e.interaction. capabilityStatementExpectation	01	FHIR endpoint conformance must be specified within the CapabilityStatement resource using the NHSDigital maintained 'Extension-CapabilityStatement- Expectation-1' extension.	The 'Extension- CapabilityStatement- Expectation-1' extension is bound to the HL7 'conformance-expectation' value set.
			It defines the level of expectation associated with a given system capability.	This value set defines the following codes which must be used when publishing a FHIR capability statement:
			https://fhir.nhs.uk/STU3/StructureDefi nition/Extension-CapabilityStatement- Expectation-1	http://hl7.org/fhir/STU3/valueset- conformance-expectation.html
	CapabilityStatement.rest.resource.s earchParam.name	11	Name of search parameter	When specified, MUST match Name of search parameter in STU3 Resource definitions.
	CapabilityStatement.rest.resource.s earchParam.definition	01	Source of definition for parameter	MUST be URI that is a formal reference to where this parameter was first defined.
				Definition SHOULD be present in both 'requirements' and'instance' capability statements.
	CapabilityStatement.rest.resource.s earchParam.type	11	number date string token reference composite quantity uri	
			SearchParamType (Required)	
	CapabilityStatement.rest.resource.s earchParam.documentation	01	Server-specific usage	
	CapabilityStatement.rest.interaction	0 *	What system operations are supported?	Out of scope for this version of profile
	CapabilityStatement.rest.resourc e.interaction. capabilityStatementExpectation	01	FHIR endpoint conformance must be specified within the CapabilityStatement resource using the NHSDigital maintained 'Extension-CapabilityStatement- Expectation-1' extension.	The 'Extension- CapabilityStatement- Expectation-1' extension is bound to the HL7 'conformance-expectation' value set.
			It defines the level of expectation associated with a given system capability.	This value set defines the following codes which must be used when publishing a FHIR capability statement:
1				

		nition/Extension-CapabilityStatement- Expectation-1	http://hl7.org/fhir/STU3/valueset- conformance-expectation.html
CapabilityStatement.rest.interaction .code	11	transaction batch search-system history-system SystemRestfulInteraction (Required)	Out of scope for this version of profile
CapabilityStatement.rest.interaction .documentation	01	Anything special about operation behaviour	Out of scope for this version of profile
CapabilityStatement.rest.searchPar am	0 *	Search parameters for searching all resources	MUST reference search parameters that apply to all resources - tags, profiles, text search etc.
CapabilityStatement.rest.operation	0 *	Definition of an operation or a custom query	Out of scope for this version of profile
CapabilityStatement.rest.resourc e.interaction. capabilityStatementExpectation	01	FHIR endpoint conformance must be specified within the CapabilityStatement resource using the NHSDigital maintained 'Extension-CapabilityStatement- Expectation-1' extension. It defines the level of expectation associated with a given system capability.	The 'Extension- CapabilityStatement- Expectation-1' extension is bound to the HL7 'conformance-expectation' value set. This value set defines the following codes which must be used when publishing a FHIR capability statement:
		nition/Extension-CapabilityStatement- Expectation-1	http://hl7.org/fhir/STU3/valueset- conformance-expectation.html
CapabilityStatement.rest.operation. name	11	Name by which the operation/query is invoked	Out of scope for this version of profile
CapabilityStatement.rest.operation. definition	11	The defined operation/query	Out of scope for this version of profile
CapabilityStatement.rest.compartm ent	0 *	Compartments served/used by system	Out of scope for this version of profile
CapabilityStatement.messaging	0 *	A description of the messaging capabilities of the solution.	Out of scope for this version of profile
CapabilityStatement.document	0 *	A document definition.	Out of scope for this version of profile