STATUS	Final Text
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Correction Number	CP-2305
Log Summary: Clarify Matching of Key Attributes with a VR of IS or DS	
Name of Standard PS3.4, PS3.2 2024a	
Rationale for Correction: The current standard text is silent on the Single Value Matching of Key Attributes with a VR of IS (Integer String) or DS (Decimal String). For example, whether the IS values "+7" and "007" match the value "7" is undefined. It is, therefore, proposed to add a new subsection for these two VRs that clarifies that matching of such values is implementation dependent. It is also proposed to require that details on the matching performed shall be specified in the Conformance Statement (similar to what is required for other VRs). For background information, see also this discussion in the newgroups "comp.protocols.dicom": https://groups.google.com/g/comp.protocols.dicom/c/JNsg7upVJ08 *Editorial changes:* The terms "Conformance Statement", "Single Value Matching", "Wild Card Matching" should be written with capital initials throughout the standard text.	
Correction Wording:	

Change PS3.4 Section C.2.2.2.1

C.2.2.2.1 Single Value Matching

If the value specified for a Key Attribute in a request is non-zero length and if it is not of VR SQ and:

a. of VR of AE, CS, LO, LT, PN, SH, ST, UC, UR or UT and contains a single value with no wild card characters, and if Extended Negotiation of Empty Value Matching is successful and it does not have the value of exactly two QUOTATION MARK characters, or

b. of VR of DA, TM or DT and contains a single value with no "-" and no QUOTATION MARK characters, or

c. of any other VR

then Single Value Matching shall be performed. Except for Attributes with a PN VR, only entities with values that match exactly the value specified in the request shall match. This matching is case-sensitive, i.e., sensitive to the exact encoding of the key Attribute Value in character sets where a letter may have multiple encodings (e.g., based on its case, its position in a word, or whether it is accented).

The following subsections define specifics for certain VRs.

C.2.2.2.1.1 Attributes of VR of PN

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C.2.2.2.1.2 Attributes of VR of AE, CS, LO, LT, PN, SH, ST, UC, UR and UT

...

C.2.2.2.1.3 Attributes of VR of DA, DT or TM

...

Add the following Section to PS3.4 (new Subsection C.2.2.2.1.4)

C.2.2.2.1.4 Attributes of VR of DS or IS

The DS and IS VRs allow numbers to be encoded as character strings. The same number can be encoded differently when using character strings. Therefore, the manner in which matching is performed is implementation dependent and shall be specified in the Conformance Statement.

> Note
>
>> For example, depending on the SCP implementation, the IS values "+7" and "007" may or may not match the value "7".

Change PS3.4 Section C.6.1.2.2.1

C.6.1.2.2.1 C-FIND SCP Conformance

An implementation that conforms to one of the SOP Classes of the Patient Root SOP Class Group shall support queries against the Query/Retrieve Information Model described in Section C.6.1.1 using the C-FIND SCP Behavior described in Section C.4.1.3.

An implementation that conforms to one of the SOP Classes of the Patient Root SOP Class Group as an SCP shall state in its Conformance Statement whether it supports Optional Keys. If it supports Optional Keys, then it shall list the Optional Keys that it supports.

An implementation that conforms to one of the SOP Classes of the Patient Root SOP Class Group as an SCP shall state in its Conformance Statement whether it supports Relational-queries. If it supports Relational-queries, then it shall also support Extended Negotiation of relational-queries as an SCP.

An implementation that conforms to one of the SOP Classes of the Patient Root SOP Class Group as an SCP shall state in its Conformance Statement whether or not it supports Extended Negotiation of combined date-time matching, fuzzy semantic matching of person names, Empty Value Matching, and/or Multiple Value Matching. If fuzzy semantic matching of person names is supported, then the mechanism for fuzzy semantic matching shall be specified.

An implementation that conforms to one of the SOP Classes of the Patient Root SOP Class Group as an SCP shall state in its Conformance Statement whether it supports case-insensitive matching for PN VR Attributes and list **the** Attributes for which this applies.

An implementation that conforms to one of the SOP Classes of the Patient Root SOP Class Group as an SCP shall state in its Conformance Statement how it makes use of Specific Character Set (0008,0005) and Timezone Offset From UTC (0008,0201) when interpreting queries, performing matching and encoding responses.

An implementation that conforms to one of the SOP Classes of the Patient Root SOP Class Group as an SCP shall state in its Conformance Statement the manner in which Single Value Matching is performed for DS and IS VR Attributes (if supported) and list the Attributes for which this applies.

Change PS3.4 Section C.6.2.2

C.6.2.2 Conformance Requirements

An implementation may conform to one of the SOP Classes of the Study ~~Hierarchy~~**Root** SOP Class Group as an SCU, SCP or both. The Conformance Statement shall be in the format defined in PS3.2.

Change PS3.4 Section C.6.2.2.2.1

C.6.2.2.2.1 C-FIND SCP Conformance

An implementation that conforms to one of the SOP Classes of the Study Root SOP Class Group shall support queries against the Query/Retrieve Information Model described in Section C.6.2.1 using the C-FIND SCP behavior described in Section C.4.1.3.

An implementation that conforms to one of the SOP Classes of the Study Root SOP Class Group as an SCP shall state in its Conformance Statement whether it supports Optional Keys. If it supports Optional Keys, then it shall list the Optional Keys that it supports.

An implementation that conforms to one of the SOP Classes of the Study Root SOP Class Group as an SCP shall state in its Conformance Statement whether it supports Relational Search. If it supports Relational Search, then it shall also support Extended Negotiation of relational-queries as an SCP.

An implementation that conforms to one of the SOP Classes of the Study Root SOP Class Group as an SCP shall state in its Conformance Statement whether or not it supports Extended Negotiation of combined date-time matching, fuzzy semantic matching of person names, Empty Value Matching, and/or Multiple Value Matching. If fuzzy semantic matching of person names is supported, then the mechanism for fuzzy semantic matching shall be specified.

An implementation that conforms to one of the SOP Classes of the Study Root SOP Class Group as an SCP shall state in its Conformance Statement whether it supports case-insensitive matching for PN VR Attributes and list **the** Attributes for which this applies.

An implementation that conforms to one of the SOP Classes of the Study Root SOP Class Group as an SCP shall state in its Conformance Statement how it makes use of Specific Character Set (0008,0005) and Timezone Offset From UTC (0008,0201) when interpreting queries, performing matching and encoding responses.

An implementation that conforms to one of the SOP Classes of the Study Root SOP Class Group as an SCP shall state in its Conformance Statement the manner in which Single Value Matching is performed for DS and IS VR Attributes (if supported) and list the Attributes for which this applies.

Change PS3.4 Section C.6.4.6.2

C.6.4.6.2 C-FIND SCP Conformance

An implementation that conforms to the Repository Query SOP Class as an SCP shall support queries against the Study Root Query/Retrieve Information Model described in Section C.6.2.1 and Section C.6.4.1 using the C-FIND SCP behavior described in Section C.4.1.3 and Section C.6.4.5.

An implementation that conforms to the Repository Query SOP Class as an SCP shall state in its Conformance Statement:

• Which Optional Keys it supports for existence (i.e., to be returned in responses) and which for matching.

• Which Attributes it supports in Items of those Key Attributes that are Sequences.

• Whether it supports Relational Search. If it supports Relational Search, then it shall also support Extended Negotiation of Relational-queries as an SCP.

• Whether or not it supports Extended Negotiation of combined date-time matching, fuzzy semantic matching of person names, empty value matching, and/or multiple value matching. If fuzzy semantic matching of person names is supported, then the mechanism for fuzzy semantic matching shall be specified.

• Whether it supports case-insensitive matching for PN VR Attributes, and list **the** Attributes for which this applies.

• How it uses Specific Character Set (0008,0005) and Timezone Offset From UTC (0008,0201) when interpreting queries, performing matching and encoding responses.

• Any limitations it places on the number of C-FIND responses.

• The conditions after which a Record Key (0008,041B) value is not valid to allow resumption of a C-FIND operation.

• Any non-DICOM mechanisms used to access SOP Instances that may be specified by a File Access URI (0008,0409), including protocols (such as NFS, SMB, or HTTP), and use of folders and/or container files (ZIP, TAR, GZIP, TARGZIP, BLOB) for the SOP Instances. If such mechanisms are used, the use of Metadata Sequence (0008,041D) or Updated Metadata Sequence (0008,041E) shall be described.

• Whether it provides responses that include entities from multiple repositories (federation), and how it handles differences in support for Attribute matching across those repositories in constructing responses.

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K.6.1.3.2 SCP Conformance

An implementation that conforms to the Modality Worklist SOP Class **as an SCP** shall support queries against the Worklist Information Model described in Section K.6.1.2 of this Annex using the C-FIND SCP Behavior described in Section K.4.1.3 of this Part.

An implementation that conforms to the Modality Worklist SOP Class as an SCP shall state in its Conformance Statement whether it supports matching on Optional Matching Key Attributes. If it supports Type 3 Return Key Attributes, then it shall list the Optional Return Key Attributes that it supports. It shall identify any Templates it supports for the Protocol Context Sequence **(0040,0440)**.

An implementation that conforms to the Modality Worklist SOP Class as an SCP shall state in its Conformance Statement whether it supports case-insensitive matching for PN VR Attributes and list **the** Attributes for which this applies.

An implementation that conforms to the Modality Worklist SOP Class as an SCP shall state in its Conformance Statement whether or not it supports Extended Negotiation of fuzzy semantic matching of person names. If fuzzy semantic matching of person names is supported, then the mechanism for fuzzy semantic matching shall be specified.

An implementation that conforms to the Modality Worklist SOP Class as an SCP shall state in its Conformance Statement how it makes use of Specific Character Set (0008,0005) and Timezone Offset From UTC (0008,0201) when interpreting queries, performing matching and encoding responses.

An implementation that conforms to the Modality Worklist SOP Class as an SCP shall state in its Conformance Statement the manner in which Single Value Matching is performed for DS and IS VR Attributes (if supported) and list the Attributes for which this applies.

N.5.2.1.2 SCP of the Modality Worklist Information Model - FIND SOP Class

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 [Describe the behavior of the product when it receives a C-FIND-CANCEL request.]

[Document your product's query capabilities and behavior for handling non-default character sets, especially for handling person names (VR of PN), e.g.:

If the product receives from the SCU a Request Identifier containing unsupported values in the Specific Character Set (0008,0005), then no matching is performed and an error will be returned indicating the SCP is unable to process the request.]

[Document your product's query capabilities and behavior for handling implementation-dependent matching of VRs, such as for DA, DT, TM, IS and DS.]

N.5.2.7.5 SCP of the Study Root Q/R Information Model - FIND SOP Class

...

[Document your product's query capabilities and behavior for handling non-default character sets, especially for handling person names (VR of PN), e.g.:

If the product receives from the SCU a Request Identifier containing unsupported values in the Specific Character Set (0008,0005), then no matching is performed and an error will be returned indicating the SCP is unable to process the request.]

[Document your product's query capabilities and behavior for handling implementation-dependent matching of VRs, such as for DA, DT, TM, IS and DS.]

[If your product supports Extended Negotiation for fuzzy semantic matching of person names describe how matching is performed, e.g., whether your matching is insensitive to case, position, accent, or character encoding, or whether you support phonetic matching.]