

Applies to:

Business Rules Framework plus shipped with **SAP NetWeaver 7.0 Enhancement Package 1**.

For more information, visit the [Business Process Modeling homepage](#).

Summary

This paper describes the type systems of elements.

Authors: Carsten Ziegler, Orenthung Ovung, Shashi Kanth Kasam

Company: SAP

Created on: 19 December 2008

About the Authors



Carsten Ziegler is the Architect and Project Manager of Business Rules Framework plus. He joined SAP in 2000. Since then he has been working in various projects as a developer, development architect and project lead.



Shashi Kanth Kasam is a Rules Developer in the BRFplus team. He has 2 years of experience in building business rules and has been part of this team since April 2008.



Orenthung Ovung is an Information Developer in the BRFplus team. He has been part of this team since March 2008.

Table of Contents

BRFplus ABAP Types.....	3
ABAP Representation.....	4
Syntax Description.....	5
Additional Attributes of an Element Type	6
Setting the attributes of an element	6
Getting the attributes of an element.....	6
Allowed Comparisons	7
Derivation of DDIC types.....	7
Related Content.....	8
Copyright.....	9

BRFplus ABAP Types

The elementary internal **BRFplus ABAP** types can be found via the interface **IF_FDT_TYPES**:

- **ELEMENT_BOOLEAN**
- **ELEMENT_CURRENCY (component of ELEMENT_AMOUNT)**
- **ELEMENT_NUMBER**
- **ELEMENT_TEXT**
- **ELEMENT_UNIT (component of ELEMENT_QUANTITY)**
- **ELEMENT_AMOUNT**
- **ELEMENT_QUANTITY**
- **ELEMENT_TIMEPOINT**

An elementary data object can consist of one of the following element types:

Type	FDT ABAP Type	Description	Maximum (Default) Length	Maximum Number of Decimals	Configurable
Text	ELEMENT_TEXT	Char	255	N/A	Yes
Number	ELEMENT_NUMBER	Number with Decimals	31	10	Yes
Boolean	ELEMENT_BOOLEAN	Char	1	N/A	No
Amount	ELEMENT_AMOUNT	Number + Currency	31	(10)	No
Quantity	ELEMENT_QUANTITY	Number + Unit	31	(10)	No
Timepoint	ELEMENT_TIMEPOINT	Timestamp (Date/Time)	N/A	N/A	Yes

Note: The length of the number types represents the number of digits without exponent or sign.

BRFplus also supports the creation of complex data types like structures and tables. These structure and table objects can include one or more fields mentioned above.

ABAP Representation

Type	Description
Text	This is of type SSTRING. (Refer associated type FDT_TEXT_SSTRING)
Number	This is of type decfloat34.(Refer associated type FDT_NUMBER_DECFLOAT)
Boolean	This is a CHAR of length 1 with the values 'X'= true (ABAP_TRUE) and ' ' (space) = false (ABAP_FALSE). (Refer associated type FDT_S_BOOLEAN)
Amount	This is a structure with the components Number and Currency. Number is of type decfloat34 and Currency is of type CHAR of length 5. (Refer associated type FDT_S_AMOUNT)
Quantity	This is a structure with the components Number and Unit where number is of type decfloat34 and Unit is of type CHAR of length 3. (Refer associated type FDT_S_QUANTITY)
Timepoint	This is a structure with components date, time, timestamp, offset_time, offset_sign and type. (Refer associated type FDT_S_TIMEPOINT)

Note: All timepoint types do not exist due to limitations in SAP NetWeaver 7.0 EHP2. Hence, all structure components are not available.

Timepoint Field	Data Type	Description and Format
Date	DATS stored as Char(8)	Date field in the format of 'YYYYMMDD'
Time	TIMS stored as Char(6)	Time field in the format of 'hhmmss'
Timestamp	DEC (15)	UTC time stamp in short form – 'YYYYMMDDhhmmss'
Offset_time	Char(3)	Value of offset in local offset datetime
Offset_sign	Char(1)	Sign of the difference from UTC (+ or -)
Type	NUMC	Timepoint Type Value '1' => local date Value '2' => local time Value '3' => local timestamp Value '4' => universal time (UTC) Value '7' => universal time (UTC) with offset

The elementary data objects allow the setting of the elementary type *timepoint*. A *timepoint* is one of these (see **IF_FDT_CONSTANTS**):

- **GC_TP_DATE**
- **GC_TP_DATETIME**
- **GC_TP_DATETIME_OFFSET_UTC**
- **GC_TP_TIME**
- **GC_TP_TIMESTAMP_UTC**

Syntax Description

Type	Declaration Syntax	Example Values
TEXT	Data lv_text_elt TYPE if_fdt_types=>element_text	lv_text_elt = 'Sample Text'
NUMBER	Data lv_num_elt TYPE if_fdt_types=>element_number	lv_num_elt = 1234
BOOLEAN	Data lv_bool_elt TYPE if_fdt_types=>element_boolean	lv_bool_elt = 'X' (ABAP_TRUE)
AMOUNT	Data ls_amount_elt TYPE if_fdt_types=>element_amount	ls_amount_elt-number = 1000 ls_amount_elt-currency = 'USD' => 1000 USD
QUANTITY	Data ls_quantity_elt TYPE if_fdt_types=>element_quantity	ls_quantity_elt-number = 100 ls_amount_elt-unit = 'cgm' => 100 centigram
TIMEPOINT	Data ls_timept_elt TYPE if_fdt_types=>element_timepoint	ls_timept_elt-date = '20081224' => 24th of Dec 2008.

Additional Attributes of an Element Type

You can set additional attributes for the following element types:

- Number
- Text
- Amount
- Quantity
- Timepoint

Setting the attributes of an element

IF_FDT_ELEMENT->SET_ELEMENT_TYPE_ATTRIBUTE

Importing Parameters:

Parameters	Description
IV_LENGTH	Sets the maximum length of an attribute (if number/text type)
IV_DECIMALS	Sets the maximum number of decimals (if number type)
IV_ONLY_POSITIVE	Ensures that the element does not have a sign (if number type)
IV_TIMEPOINT_TYPE	Ensures that the element shall have the specified timepoint type (if timepoint)

Getting the attributes of an element

IF_FDT_ELEMENT->GET_ELEMENT_TYPE_ATTRIBUTE

Remarks:

- If the value of a constant does not fit in the attributes of an element type (for example, exceeds the length) the API (check) returns only warning messages. That means that the object can still be activated. This behavior might change in the future.
- The attributes of an element type (length, number of decimals etc.) only affect the design time but not the runtime of BRFplus. That means for example, that calculations are always done with decfloat precision.

Allowed Comparisons

BRFplus defines the types of comparison that can be performed on a certain element. This is done with the following methods:

- **IF_FDT_ELEMENT~GET_ALLOWED_COMPARISONS**
- **IF_FDT_ELEMENT~SET_ALLOWED_COMPARISONS**

The second method allows BRFplus to set restrictions in comparisons, for example, in decision tables or decision trees. With this feature, you can define whether a given value is compared against a single value, a list of discrete values, a value range, etc.

The following attributes can be set for the parameters to restrict the comparisons:

- **IF_FDT_ELEMENT=>GC_COMPARISONS_EQUALS** (is equal to one value)
- **IF_FDT_ELEMENT=>GC_COMPARISONS_NO_RESTRICTION** (no restrictions, default)
- **IF_FDT_ELEMENT=>GC_COMPARISONS_SIMPLE_VALUE** (is equal or not to one value)
- **IF_FDT_ELEMENT=>GC_COMPARISONS_VALUE_LIST** (is equal or not to one or multiple values from a list of discrete values)
- **IF_FDT_ELEMENT=>GC_COMPARISONS_USER_DEFINED** (options, signs, multiple has to be supplied additionally)

If a parameter (elementary context data object) has the attribute value **IF_FDT_ELEMENT=>GC_COMPARISONS_EQUALS** set in a cell of a decision table with one or no value then lower or greater comparisons do not make sense and cannot be used. This is especially helpful when identifiers are used.

Derivation of DDIC types

By calling **IF_FDT_DATA_OBJECT~DERIVE_DATA_OBJECT** you are able to derive BRFplus data objects from DDIC types.

The following table describes which element type is created according to the supplied DDIC type:

DDIC Type	Element Type	Max Length	Max Number of Decimals	Only Positive Values	Timepoint Type
Char	Text	1-255	n/a	n/a	n/a
String	Text	255	n/a	n/a	n/a
Numc	Text	1-255	n/a	n/a	n/a
Int1	Number	1-3	0	Yes	n/a
Int, int4	Number	10	0	No	n/a
Int2	Number	5	0	No	n/a
Packed	Number	1-31	10	No	n/a
Float	Number	16	10	No	n/a
Decfloat16	Number	16	10	No	n/a
Decfloat34	Number	31	10	No	n/a
Date	Timepoint	n/a	n/a	n/a	Date
Time	Timepoint	n/a	n/a	n/a	Time
Timestamp (!)	Timepoint	n/a	n/a	n/a	UTC Timestamp

Related Content

- BRFplus – The Very Basics
- Formula Functions
- Using BRFplus with a Third-Party Rules Engine
- Wikipedia, Business Rules: http://en.wikipedia.org/wiki/Business_rules
- Wikipedia, Business Rule Management System: http://en.wikipedia.org/wiki/Business_Rule_Management_System
- Carsten Ziegler, About Business Rules: <https://www.sdn.sap.com/irj/sdn/weblogs?blog=/pub/wlg/9713>
- Carsten Ziegler, BRFplus a Business Rule Engine written in ABAP, <https://www.sdn.sap.com/irj/sdn/weblogs?blog=/pub/wlg/8889>
- Carsten Ziegler, Important Information for Using BRFplus <https://www.sdn.sap.com/irj/sdn/weblogs?blog=/pub/wlg/11632>
- Rajagopalan Narayanan, Business Rules and Software Requirements, <https://www.sdn.sap.com/irj/scn/go/portal/prtroot/docs/library/uuid/40aae118-42c2-2a10-fcaf-fdd9d30bcb1a>
- Rajagopalan Narayanan, Seven Tips for Your First Business Rules Project, <https://www.sdn.sap.com/irj/sdn/go/portal/prtroot/docs/library/uuid/201a9e3d-3ec2-2a10-85b2-ce56d276dd7a>
- Rajagopalan Narayanan, Real World Return of Investment Scenarios with Business Rules Management, <https://www.sdn.sap.com/irj/sdn/go/portal/prtroot/docs/library/uuid/b050905e-3cc2-2a10-979a-81a57a787f56>
- Rajagopalan Narayanan, Five Reasons to Build Agile Systems Using Business Rules Management Functionality, <https://www.sdn.sap.com/irj/sdn/go/portal/prtroot/docs/library/uuid/504486eb-43c2-2a10-f5a7-e84ef3fd45be>
- Rajagopalan Narayanan, How Business Rules Management Functionality Helps Tariff Plans Management in Transportation and Shipping, <https://www.sdn.sap.com/irj/sdn/go/portal/prtroot/docs/library/uuid/40a9cf69-40c2-2a10-8a8b-969fb311dd31>
- Rajagopalan Narayanan, Getting Started with Business Rules Management, <https://www.sdn.sap.com/irj/sdn/go/portal/prtroot/docs/library/uuid/70c669d8-3ac2-2a10-0e96-c7c3786168f0>

Copyright

© 2008 SAP AG. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP AG. The information contained herein may be changed without prior notice.

Some software products marketed by SAP AG and its distributors contain proprietary software components of other software vendors.

Microsoft, Windows, Outlook, and PowerPoint are registered trademarks of Microsoft Corporation.

IBM, DB2, DB2 Universal Database, OS/2, Parallel Sysplex, MVS/ESA, AIX, S/390, AS/400, OS/390, OS/400, iSeries, pSeries, xSeries, zSeries, System i, System i5, System p, System p5, System x, System z, System z9, z/OS, AFP, Intelligent Miner, WebSphere, Netfinity, Tivoli, Informix, i5/OS, POWER, POWER5, POWER5+, OpenPower and PowerPC are trademarks or registered trademarks of IBM Corporation.

Adobe, the Adobe logo, Acrobat, PostScript, and Reader are either trademarks or registered trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Oracle is a registered trademark of Oracle Corporation.

UNIX, X/Open, OSF/1, and Motif are registered trademarks of the Open Group.

Citrix, ICA, Program Neighborhood, MetaFrame, WinFrame, VideoFrame, and MultiWin are trademarks or registered trademarks of Citrix Systems, Inc.

HTML, XML, XHTML and W3C are trademarks or registered trademarks of W3C®, World Wide Web Consortium, Massachusetts Institute of Technology.

Java is a registered trademark of Sun Microsystems, Inc.

JavaScript is a registered trademark of Sun Microsystems, Inc., used under license for technology invented and implemented by Netscape.

MaxDB is a trademark of MySQL AB, Sweden.

SAP, R/3, mySAP, mySAP.com, xApps, xApp, SAP NetWeaver, and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP AG in Germany and in several other countries all over the world. All other product and service names mentioned are the trademarks of their respective companies. Data contained in this document serves informational purposes only. National product specifications may vary.

These materials are subject to change without notice. These materials are provided by SAP AG and its affiliated companies ("SAP Group") for informational purposes only, without representation or warranty of any kind, and SAP Group shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP Group products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

These materials are provided "as is" without a warranty of any kind, either express or implied, including but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement.

SAP shall not be liable for damages of any kind including without limitation direct, special, indirect, or consequential damages that may result from the use of these materials.

SAP does not warrant the accuracy or completeness of the information, text, graphics, links or other items contained within these materials. SAP has no control over the information that you may access through the use of hot links contained in these materials and does not endorse your use of third party web pages nor provide any warranty whatsoever relating to third party web pages.

Any software coding and/or code lines/strings ("Code") included in this documentation are only examples and are not intended to be used in a productive system environment. The Code is only intended better explain and visualize the syntax and phrasing rules of certain coding. SAP does not warrant the correctness and completeness of the Code given herein, and SAP shall not be liable for errors or damages caused by the usage of the Code, except if such damages were caused by SAP intentionally or grossly negligent.