

TRAIN ID Group

Framework for Usage of Variant

History of document versions

Version	Date	Author	Reason for change / comment
0.1	2014-10-06	Helmut Hantak	Creation (1 st draft)
0.2	2015-03-03	Helmut Hantak	Test examples
0.3	2015-06-24	Seid Maglajlic	Review results integrated. Rules 5 and 6 to be the subject of impact analysis
0.4	2015-11-11	Christian Weber	Comments of TrID meeting on 20-10-2015 integrated

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1. About this document

This document contains the concise description of the framework for usage of the Variant in the TrainIdentifier of an object “Train”. The basic cases that explain the usage of the variant are provided in the form of a table with one column and four rows:

Precondition – the precondition that has to be fulfilled
Trigger – the situation or circumstances which drove the company to the decision to create a Variant (or in general a new object)
Business process – we refer here to the Business Scenarios given in the WG 10 Handbook that are translated into the UML Model Activity Diagrams. The readers are required to be familiar with both WG 10 Handbook and the corresponding UML Models before examining this document.
Illustration (in some cases)
Consequences: what happens after the Variant (or in general a new object) has been created – which business processes should be considered?

2. Introduction

The Framework for Usage of Variant presented here considers situations using the Train object; described in WG 10 Handbook and then used in TG 4 (follow TG 4 UML-Diagrams numbering scheme shown below). Some of the content can also be found in the Sector Handbook, however, here it is described in more detail.

2.1 The variant: What is it all about?

When an object is created such as a train or path in the planning phase it is possible that this object changes over the year (timetable period). E.g. the same train could be retimed at a weekend or in the summer and winter. Without the variant field this would result in there being 2 records of a train with the same core element which would not be unique. One alternative is to use another identifier but then the relationship between them is lost. Another alternative is to include the “Variant” in the identifier. In these cases for a weekend or in the summer and winter timetable they would be classed as the same core element but a different variant.

2.2 The Format of the Identifier

1. Planning: <Object Type>/<Company>/< Core>/<Variant>/< TimetableYear>

2. Operation: <Object Type>/<Company >/<Core>/<Variant>/< TimetableYear>/<Start-Date >

Format:

Elements	Coding	Digits
Object type	AN	2
Company	TAF-TSI/ N	4
Core	AN	12
Variant	Internal/AN	2
TimetableYear	YYYY /N	4

(Start-Date)	YYYY-MM-DD/D	10
Sum	Planning	24
Sum	Operation	34

Delimiters are not stored, they are only used if the train ID is presented as a concatenated string!

2.3 Difference between Variant and Version

General meaning of version:

When changes are made to an object (such as a document) which is to be shared between different people it is good practice to put a version number on the object so everyone can check if they have the latest version. A good example is a document (such as these guidelines). The document has a version number. A later version (higher number) always replaces an earlier version (lower number).

Meaning of variant in TrainID:

In the process of time tabling there is another different problem. A train is planned for up to 365 days a year. However it may be necessary to have a slightly different train on some days of the year to others. E.g. there may be extra stops on the train on Sundays to other days of the week. In these cases there would need to be two “forms” of the same planned train. However one would not replace the other, they would both exist on different days. In these cases they would not be a new “Version”, instead they would be a new “Variant” as both old and new variant could exist at the same time. The variant is added to the identifier to make a new unique ID for the Object, like a “suffix” to denote a variation in the original. To all intents and purposes a new variant generates a completely new ID. However because it has the same core element all business users can see this in principle as the same train. The variant field is a fixed length of 2 characters. It can use any digit from 0 to 9 and any upper case character from A to Z. It can not be shortened to 1 character and can not use any punctuation or spaces. Internal rules apply, how to use the variant.

The variant identifies the calendar of the corresponding object. During the planning phase several train/path/other objects will be created. They differ slightly in their information (e.g. a train running Monday to Friday has a different timetable than the same train on Saturday). To make the link visible between those similar elements the variant is used. Each object has the same core (~ family) and the other fields for the identifier but they differ in the variant (~ individual). So it is possible to see the relationship between the object. During the life span of an object it may happen that the object changes for one (operational) or several start-dates (re-planning). In case that the change is not relevant for all start-dates a new variant is generated.

2.4 Usage of the Variant in Re-Planning

If these changes affect more than one start-date but not all start-dates of the calendar of the variant there will be two new calendars and variants created. One with the new set of information and the

calendar with the affected start-dates and another one with the remaining start-dates and the unchanged information.

2.5 To be decided: To use a “new core element” or a “Variant”

If there is a change to the details of the train on different days of the plan (e.g. weekends vs. week days) the RU may either use a new core element or the existing core element with a new variant. This will be up to the LeadRU.

2.6 Rules to be applied using a “Variant”

Rule 1: Using a VARIANT is always meaning to create a completely NEW Object !!!

Rule 2: Only the owner of the basic object can create a Variant (because of common company code)

Rule 3: The variant can be used only in the standard structure of the code. The rule applies for both planning and operational code type

Rule 4: The variant has 2 digits

Proposal for further impact analysis: Rule 5: The first created object has always the Variant “00”

Proposal for further impact analysis: Rule 6: The variant has to be started with 01, using then 02,03,...a0,a1,a2,a3,.....z8,z9. The variant values do not indicate the order of the messages or any other chronology.

Rule 7: The variant has no meaning of a version

NOTE: Rules 6 and 7 are proposed in order to make it easier for the implementation in the IT systems – starting with 00 and applying all variations of 2 alphanumeric characters in a logical order (01, 02, 03 etc.).

In this document we will provide the example of Y-traffic planning (in the “Planning” phase).

The use of the variant in the re-planning and operational phase depends on the strategy which will be chosen by the particular company: is the variant going to be used in the replanning for the action “Change of Train”. If yes, the scenario for the operation “Change of Train” described in the UpdateLink Framework document applies.

3. RU Triggered: Variant used in the object “Train” Object during planning phase

Precondition:

RU is planning Y-Traffic

Trigger:

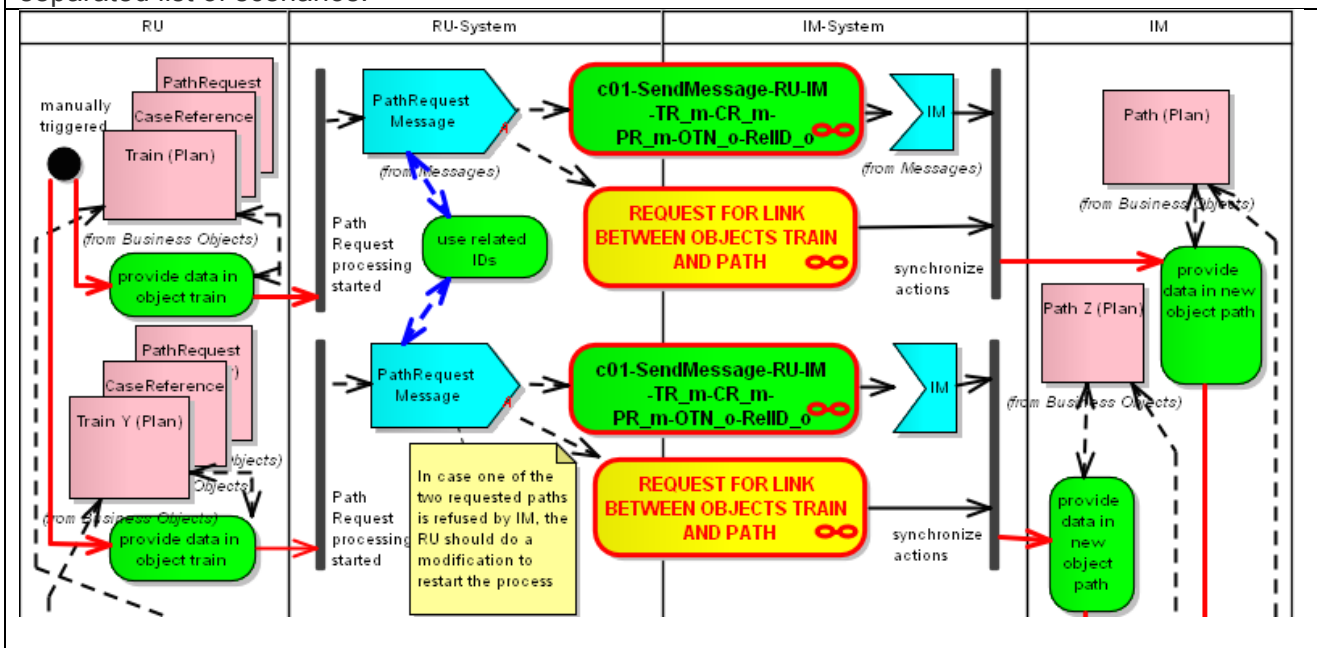
RU wants to join two trains in station “G”

Business process:

See the UML activity diagram for WG10 business scenario “4.8 Planning Y-Traffic”

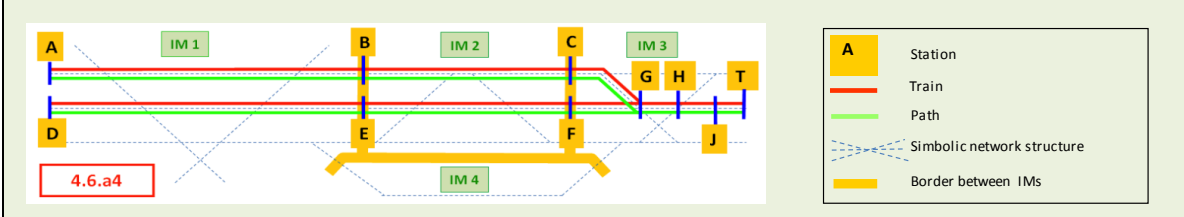
Activity: RU is presenting 2 Path requests. The relationship between the two trains is documented using a variant.

Note: this is an example of usage of Variant. The detailed test cases are provided in the separated list of scenarios.



4.6.a4.CAL: "PLANNING" 1 RU - 3 IM (open access), MAIN train (1-7) from G to T, SUB 1 train from A to G(1-5), SUB 2 train from D to G(6,7),3 (Calendar approach)

RNE:



LOC	RU	TR-ID	Date	Time	PR-ID	IM	PA-ID	OTN-Matrix	Comments	Messages
A	1	TR[(RU1)-(core-xy1)-(v00)]	1-5	09:00	PR[(RU1)-(core-ac1)-(v00)]	1	PA[(IM1)-(core-st1)-(v00)]	65418	Link between TRAIN and PATH	MAIN Start
B					PR[(RU1)-(core-ac1)-(v00)] PR[(RU1)-(core-bd1)-(v00)]	1 2	PA[(IM1)-(core-st1)-(v00)] PA[(IM2)-(core-tv1)-(v00)]	65418	OTN kept !!!	
C					PR[(RU1)-(core-bd1)-(v00)] PR[(RU1)-(core-fg1)-(v00)]	2 3	PA[(IM2)-(core-tv1)-(v00)] PA[(IM3)-(core-vx1)-(v00)]	65418 38622	Change of OTN	
G	1	TR[(RU1)-(core-xy1)-(v00)]	1-5	14:55	PR[(RU1)-(core-fg1)-(v00)]	3	PA[(IM3)-(core-vx1)-(v00)]	38622		
H	1					3	PA[(IM3)-(core-fr1)-(v00)] PA[(IM3)-(core-gr1)-(v00)]	47511	Change of PATH, same OTN	
J						3	PA[(IM3)-(core-gr1)-(v00)]	47511 31615	Change of OTN	
T	1	TR[(RU1)-(core-xy1)-(v00)]	1-5	18:00	PR[(RU1)-(core-fg1)-(v00)]	3	PA[(IM3)-(core-rs1)-(v00)]	45045	Change of PATH	MAIN End
D	1	TR[(RU1)-(core-xy1)-(v01)]	6,7	10:00	PR[(RU1)-(core-ac1)-(v00)]	1	PA[(IM1)-(core-cd1)-(v00)]	34516	Link between TRAIN and PATH	SUB 1 Start
E					PR[(RU1)-(core-ac1)-(v00)] PR[(RU1)-(core-bd1)-(v00)]	1 2	PA[(IM1)-(core-cd1)-(v00)] PA[(IM2)-(core-de1)-(v00)]	34516 34718		
F					PR[(RU1)-(core-bd1)-(v00)] PR[(RU1)-(core-fg1)-(v00)]	2 3	PA[(IM2)-(core-de1)-(v00)] PA[(IM3)-(core-ef1)-(v00)]	34718 47511	Change of OTN	
G	1	TR[(RU1)-(core-xy1)-(v01)]	6,7	15:00	PR[(RU1)-(core-fg1)-(v00)]	3	PA[(IM3)-(core-ef1)-(v00)] PA[(IM3)-(core-fr1)-(v00)]	47511		
H	1					3	PA[(IM3)-(core-fr1)-(v00)] PA[(IM3)-(core-gr1)-(v00)]	47511	Change of PATH, same OTN	
J						3	PA[(IM3)-(core-gr1)-(v00)]	47511 31615	Change of OTN	
T	1	TR[(RU1)-(core-xy1)-(v01)]	6,7	18:00	PR[(RU1)-(core-ac1)-(v00)]	3	PA[(IM3)-(core-rs1)-(v00)]	45045	Change of PATH	SUB 1 End

Consequences:

1. Two different objects “Train” are shown. The relationship is documented by using the variant.
2. General rules for “using a variant” are applying.

Conclusion

The following rules have been set up:

Rule 1: Using a VARIANT is always meaning to create a completely NEW Object !!!
Rule 2: Only the owner of the basic object can create a Variant (because of common company code)
Rule 3: The variant can be used only in the standard structure of the code
Rule 4: The variant has 2 digits
Proposal for further impact analysis: Rule 5: The basic object has always the Variant "00"
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Rule 7: The variant has no meaning of a version

The cases provided in this document serve as the basis for further development of applications that use the Variant. Further use with the other involved identifiers (Path, Path Request and Case Reference), is possible; additionally the "Variant" can be used easily in other objects like shift diagrams and rolling stock diagrams.