Generation of Documentation using ASIS Tools

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Overview

- Inception
  - Why do this?
- Elaboration
  - Prototyping, proof-of-concept
- Construction
  - Exercising all possible leverage
- Transition
  - Looking back, and looking forward

Inception

- Why do this?
  - Large projects can receive code drops without complete documentation
  - Reduce the effort to maintain IDDs
  - Reduce the time required to maintain IDDs
  - Reduce the cost of maintaining IDDs
  - Synchronize the documentation with the as-built reality
    - Documentation becomes an artifact of the code

Elaboration

- First prototype was a 100-line ASIS program
- Written over a weekend using Rational Apex
- Extracted key information
- Expanded to handle more component types, validate the concept
- The learning curve for ASIS is steep
  - It took considerable investment to become effective
  - By the time we had validated the concept, we were hot!
- Unfortunately, there’s no “ASIS for Dummies”
- Zen of ASIS: *it’s a loosely typed system implemented in a strongly typed language*

Construction

- Transitioned from stand-alone prototype to Ada Analyzer™ (Littletree Consulting) extension
  - Make use of annotation collection code already existing
  - Leverage ASIS navigation code
  - Leverage front-end, type-resolution code
- Created in-memory representation to facilitate reporting
- Created RTF output code (graphical tables)
  - We briefly considered HTML
- 80% goal expanded to full coverage
  - Tagged types,Discriminated record types
- ASIS viewer (Apex tool) proved invaluable

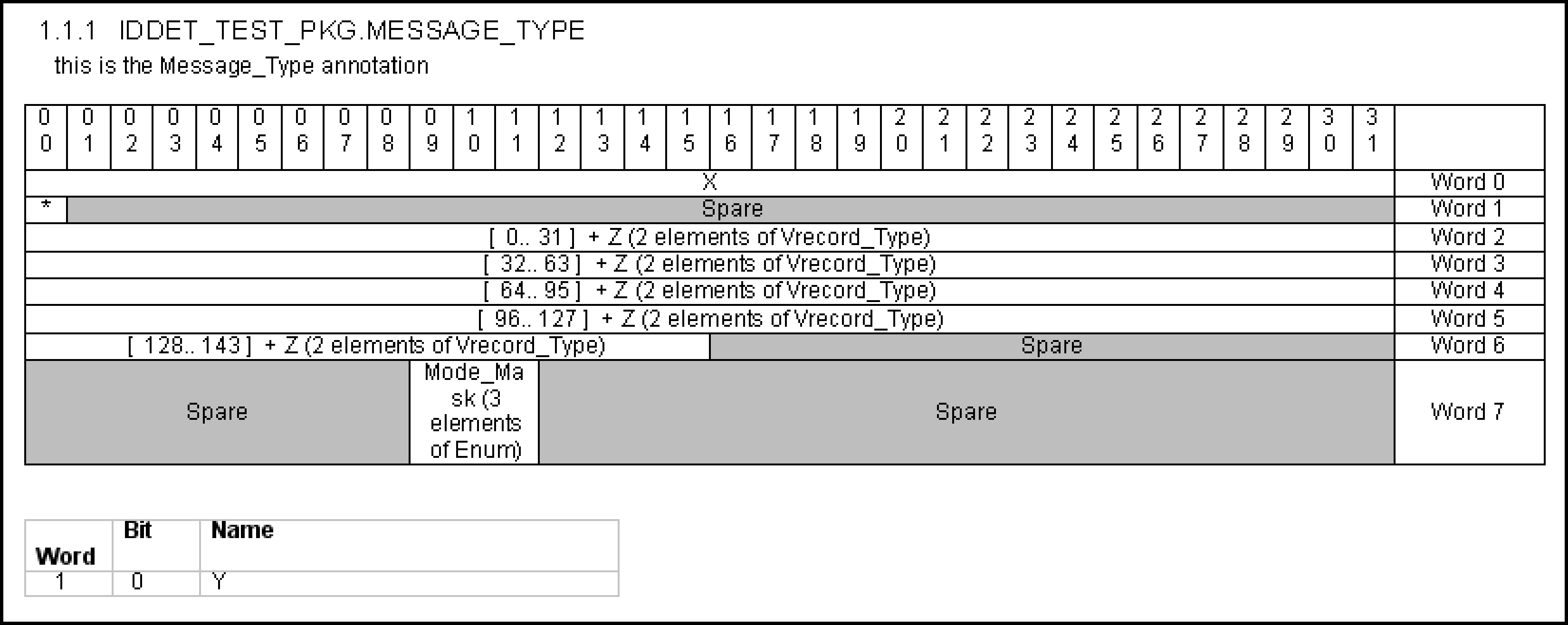
IDDET input

- Record types
  - Vanilla
  - Tagged
  - Discriminated
- To construct a bitmap, needs a rep spec
- Without a rep spec, only get a list of the researched record elements
- Record Components can be varied
  - Array, scalar, record, etc.

IDDET Output

- Component types are “researched” –
  - Records are recursively handled
  - Array bounds + element type are discovered
  - Subtypes are resolved to the base type + constraint
  - Discriminants are found & choices resolved
  - Enumeration literals are displayed
  - Specific annotations are noted
- Presence of rep spec reorders the order of the displayed components in rep-spec order, enables bitmap.
- Output format J-016-1995

IDDET Sample Output



1.1.1 IDDET_TEST_PKG.MESSAGE_TYPE

this is the Message_Type annotation

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
X																																Word 0
*	Spare																															Word 1
[0.. 31] + Z (2 elements of Vrecord_Type)																																Word 2
[32.. 63] + Z (2 elements of Vrecord_Type)																																Word 3
[64.. 95] + Z (2 elements of Vrecord_Type)																																Word 4
[96.. 127] + Z (2 elements of Vrecord_Type)																																Word 5
[128.. 143] + Z (2 elements of Vrecord_Type)																Spare																Word 6
Spare									Mode_Mask (3 elements of Enum)			Spare																				Word 7

Word	Bit	Name
1	0	Y

Transition

- Released production version
- Common complete code base supports
  - Solaris 2.6, 2.7
  - HP-UX 10.20, 11.0
- No distinction for host/embedded source
  - ASIS is the same (but beware endian!)
- Looking forward
  - ASIS 2.0
  - NT hosting
    - (LittleTree has just produced NT version of the Ada Analyzer™)