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Wrapping up Eolian

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Last year summary

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New C generator

- Rewritten from scratch
- Lower-maintenance codebase
- Easier to use interface
- Capable of generating several files
- Created against modern Eolian library
- Better C doc generation
- Many others, too

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New C generator

```
# old unintuitive args
eolian_gen --eo --gh -o test.eo.h test.eo
eolian_gen --eo --gc -o test.eo.c test.eo
eolian_gen --legacy --gh -o test.legacy.h test.eo

# filenames, types etc all figured out automatically
eolian_gen -ghlc test.eo

# may freely override anything
eolian_gen -oh:foo.h -oc:bar.c -ghc test.eo

# base name plus one specific name
# generates test.c, test.h, foo.h for legacy
eolian_gen -o test -ol:foo.h -ghlc foo.eo
```

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Extended validation engine

- Better error catching
- Better error messages
- Two-pass validation
- Expression type checking
- Documentation validation
- And much more

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Replaced pointer system

- No more raw C pointers
  - Cleaner mapping to bindings
  - Much easier generation
  - Easier to verify, too
  - Simpler syntax
  - Maps well to C as well

```
# old
foo: const(char)*
# new
foo: ptr(const(char))*
```

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Documentation support

- Doc tokenizer builtin in libeolian
- Easy API to resolve references
- Builtin parsing of brief/description/since
- Builtin parsing of paragraphs
- Utilized in C generator
- Utilized in Eo documentation generator

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Documentation support

```
/* a paragraph with documentation */
const char *par = ...;

Eolian_Doc_Token tok;
eolian_doc_token_init(&tok);

for (;;) {
   par = eolian_documentation_tokenize(par, &tok);
   switch (eolian_doc_token_type_get(&tok)) {
      case EOLIAN_DOC_TOKEN_UNKNOWN:
         goto loopend;
      case EOLIAN_DOC_TOKEN_TEXT:
         ...; continue;
      default:
         ...; continue;
   }
loopend:
   break;
}
```

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Convenience

- New utility APIs in libeolian
- Mostly to get C names of things
- Simplify interaction with C impls
- Useful for binding generators
- Also used in the C generator itself
- Single impl => guaranteed consistency

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Revamped implements

- New syntax for implementing properties
- Explicit and not error-prone
- Either get, set or both are required
- Much simplified implement filling logic
- Duplicate implements no longer allowed
- Generally better error checking

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Revamped implements

```
/* old */
Foo.Bar.some_property;
/* new */
Foo.Bar.some_property { get; set; }

/* old and new */
Foo.Bar.some_method;

/* no longer allowed */
Foo.Bar.impl;
Foo.Bar.Impl;
```

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Documentation

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Former state

- Doxygen for docs
- Didn‘t cover bindings at all
- Hard to generate generic docs from Eo files
- Messy and hard to follow
- Been rotting for a few years

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Using Eo files for docs

- All information already there
- Language-generic docs
- Extended by users
- Language-specific notes
- A new doc generator

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Dokuwiki

- A wiki engine used for our website
- All necessary features already present
- Namespaces for content separation
- Extensions for missing features
- Simple markup format
- No database – just a bunch of files

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Lua

- Full Eolian access from Lua
- Perfect for a documentation generator
- Use Eolian API to parse Eo files
- Use Lua to generate Dokuwiki files
- Multi-pass design for parallel generation
- Efficient and simple to extend

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User defined docs

- Generated docs in „auto“ namespace
- User docs in „user“ namespace
- Dokuwiki page includes
- Seamless experience
- Adding new sections to auto docs by users
- Updates => remove „auto“, regenerate
- No information lost

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Problems

- Only covers Eo API
- Still some missing convenience
- Non-Eo API is Doxygen
- Poor integration between the two
- Taking ideas

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Open issues

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Unit system

- Contain parse tree and dependencies
- Remove global state (potentially)
- More compile-time strictness
- Possibly handle new classes of errors
- Easier validation and verification
- Potential thread safety (parallel parsing/generation?)

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Documentation

- Still plenty more to do
- User experience needs work
- Generator unit system integration
- Language specific notes
- More elaborate user doc extensions
- More ideas?

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Ownership

- A big problem
- Is our design any good?
- Missing information in eo files
- No static verification
- Cannot be statically verified :(
- A source of bugs

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Function pointers

- Recently brought up
- Do we want them?
- Lifetime handling is difficult
- Restricted version?
- Mapping to languages is hard
- Maybe just use events

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Dependency management

- Needs a complete rewrite
- Allow dependency cycles everywhere
- Emit appropriate C code (forward decls)
- Figure out mapping to languages
- Error messages are a problem
- Might need deeper rewrites

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Other things

- Various proposals on phab recently
- Go over all of them and figure it out
- Do a complete API revision
- Stabilize the API
- (then break it 5 more times)
- (and maybe some more)
- And maybe then...

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Conclusion

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Conclusion

- Plenty more to do
- Taking more feature proposals
- Feedback always appreciated
- Especially from generator writers
- Lua bindings after this

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Thanks for listening!

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