Benefits & Limitations of Patterns & Frameworks: Part 2

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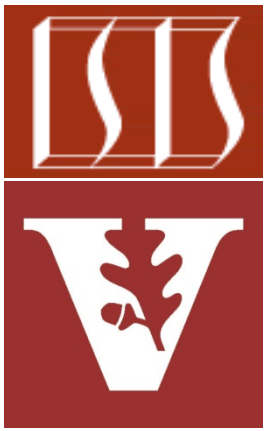

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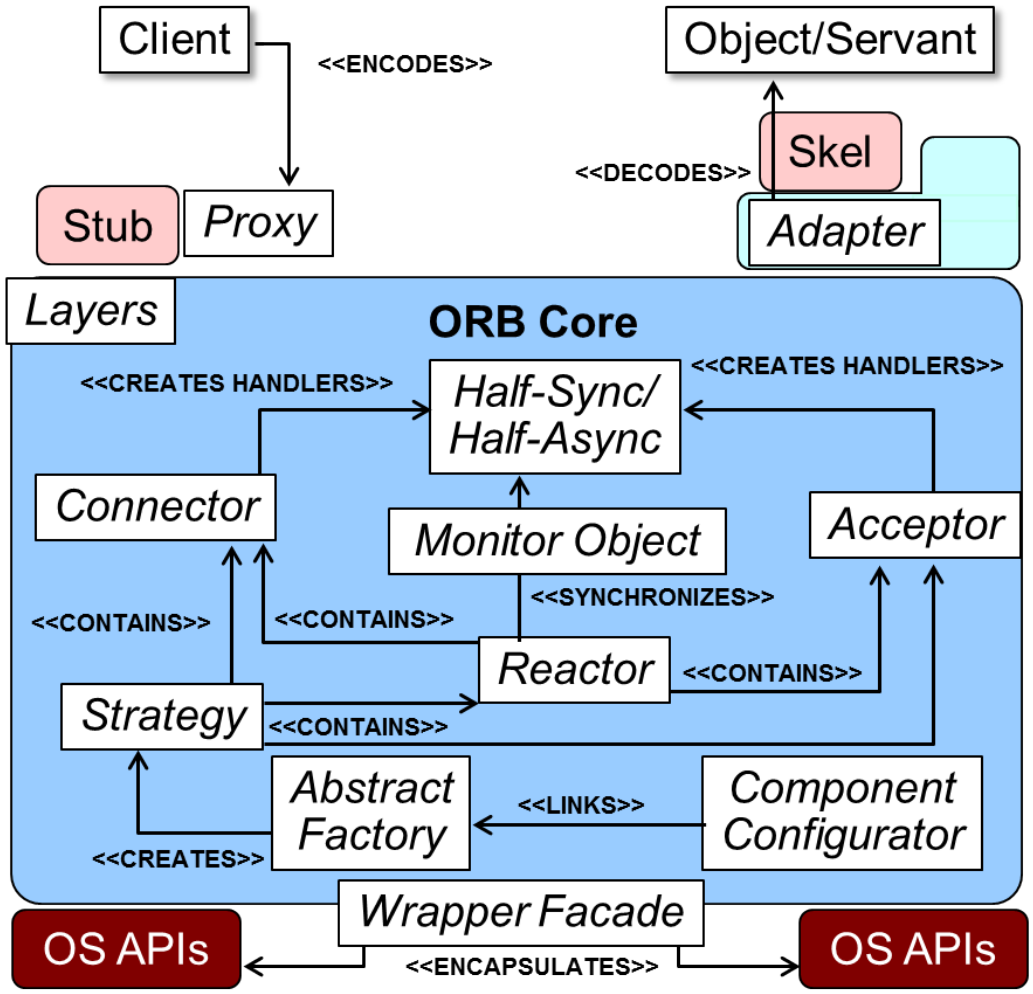
Topics Covered in this Part of the Module

- Summarize the benefits & limitations of patterns
- Summarize the benefits & limitations of frameworks

Benefits of Frameworks

- **Design reuse**
  - e.g., by guiding app developers thru steps needed to ensure successful creation & deployment of software



See www.dre.vanderbilt.edu/~schmidt/PDF/ORB-patterns.pdf for more info

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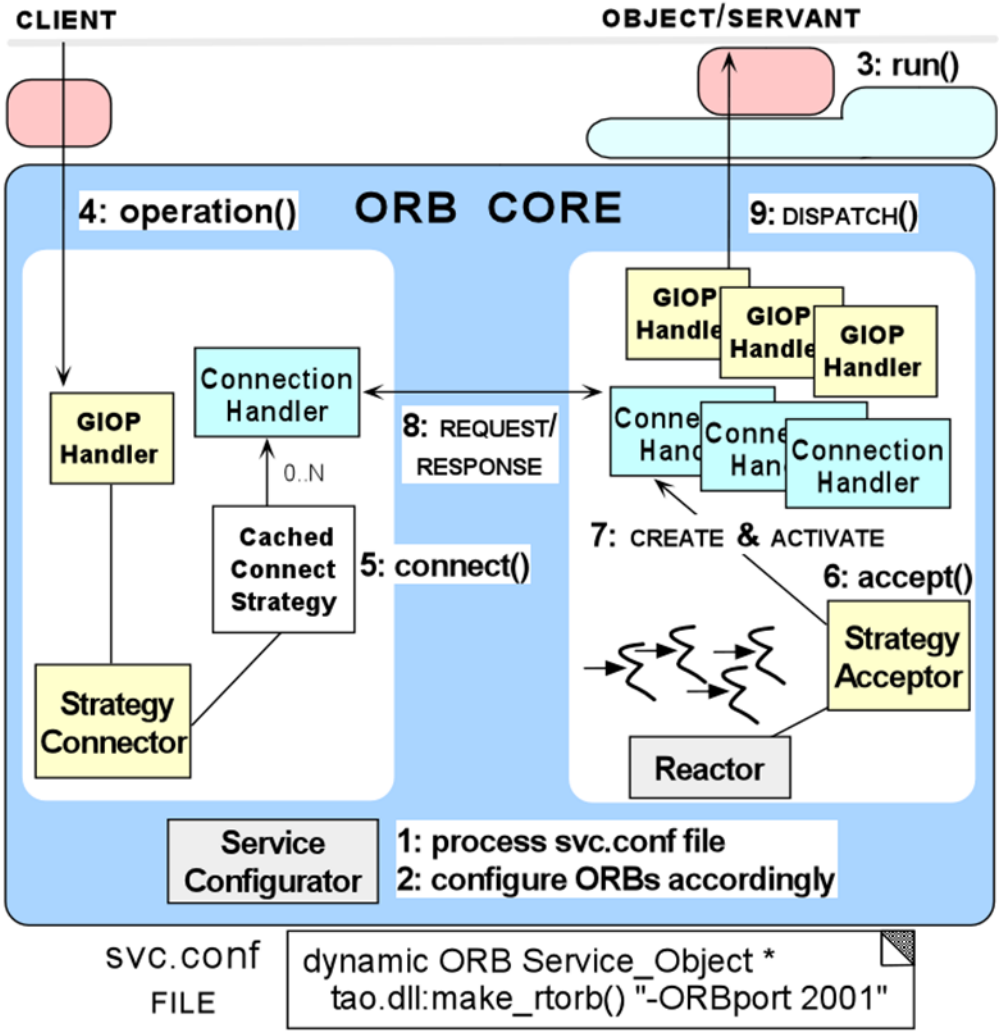
- **Implementation reuse**
  - e.g., by leveraging previous development & optimization efforts & amortizing software lifecycle costs



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- Design reuse
  - e.g., by guiding app developers thru steps needed to ensure successful creation & deployment of software
- Implementation reuse
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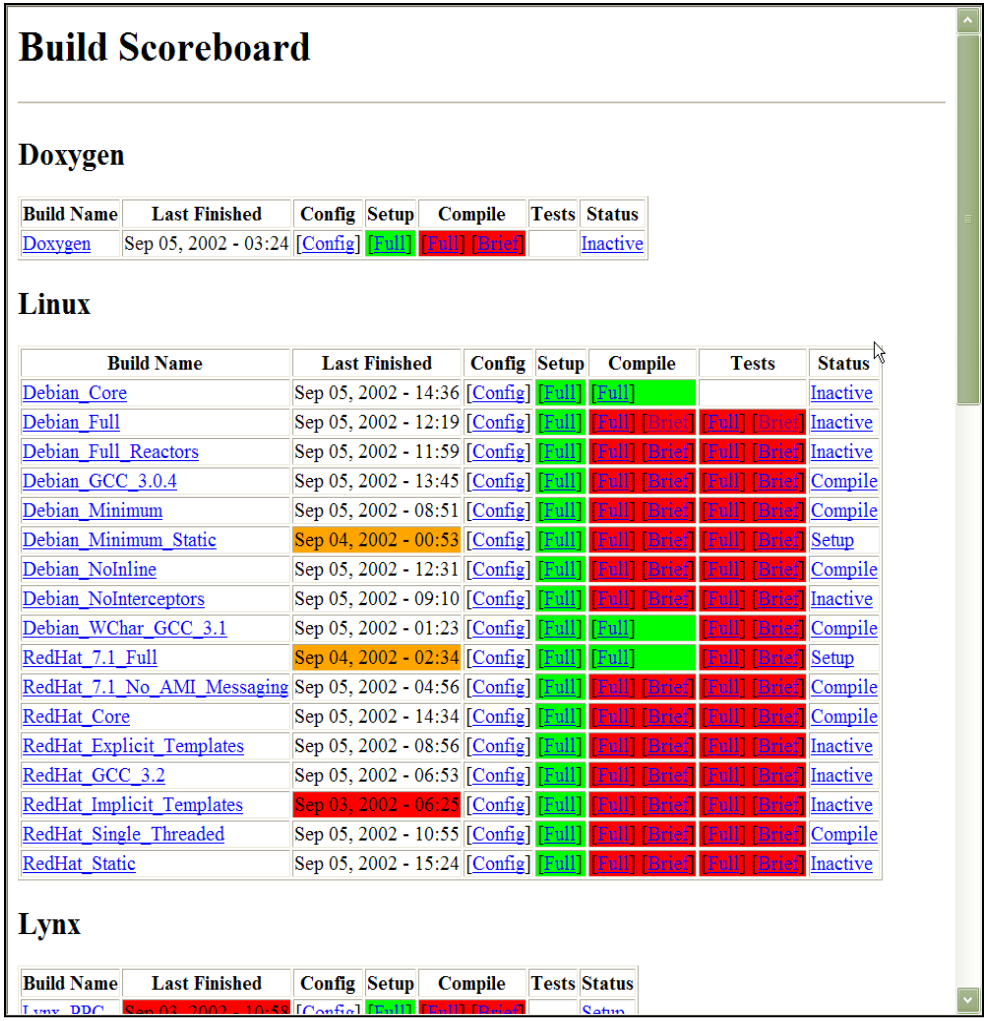
- **Validation reuse**
  - e.g., by amortizing the efforts of validating application- & platform-independent portions of software, thereby enhancing dependability & performance



Build Scoreboard

Doxygen

Build Name	Last Finished	Config	Setup	Compile	Tests	Status
Doxygen	Sep 05, 2002 - 03:24	[Config]	[Full]	[Full] [Brief]		Inactive

Linux

Build Name	Last Finished	Config	Setup	Compile	Tests	Status
Debian_Core	Sep 05, 2002 - 14:36	[Config]	[Full]	[Full]		Inactive
Debian_Full	Sep 05, 2002 - 12:19	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Inactive
Debian_Full_Reactors	Sep 05, 2002 - 11:59	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Inactive
Debian_GCC_3.0.4	Sep 05, 2002 - 13:45	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Compile
Debian_Minimum	Sep 05, 2002 - 08:51	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Compile
Debian_Minimum_Static	Sep 04, 2002 - 00:53	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Setup
Debian_NoInline	Sep 05, 2002 - 12:31	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Compile
Debian_NoInterceptors	Sep 05, 2002 - 09:10	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Inactive
Debian_WChar_GCC_3.1	Sep 05, 2002 - 01:23	[Config]	[Full]	[Full]	[Full] [Brief]	Compile
RedHat_7.1_Full	Sep 04, 2002 - 02:34	[Config]	[Full]	[Full]	[Full] [Brief]	Setup
RedHat_7.1_No_AMI_Messaging	Sep 05, 2002 - 04:56	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Compile
RedHat_Core	Sep 05, 2002 - 14:34	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Compile
RedHat_Explicit_Templates	Sep 05, 2002 - 08:56	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Inactive
RedHat_GCC_3.2	Sep 05, 2002 - 06:53	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Inactive
RedHat_Implicit_Templates	Sep 03, 2002 - 06:25	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Inactive
RedHat_Single_Threaded	Sep 05, 2002 - 10:55	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Compile
RedHat_Static	Sep 05, 2002 - 15:24	[Config]	[Full]	[Full] [Brief]	[Full] [Brief]	Inactive

Lynx

Build Name	Last Finished	Config	Setup	Compile	Tests	Status
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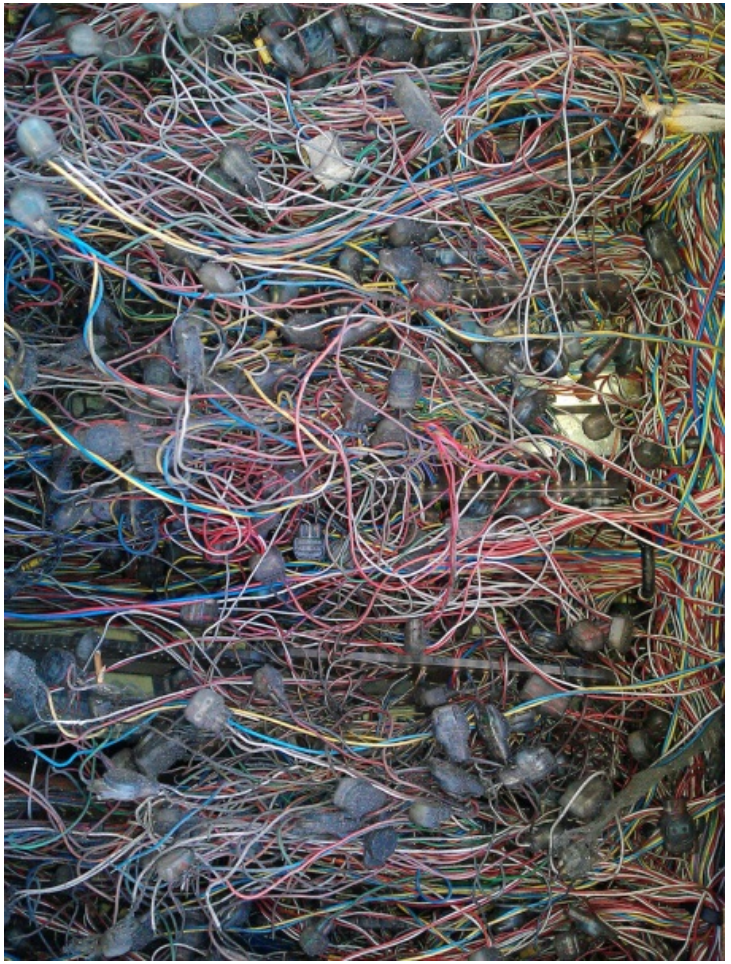
Limitations of Frameworks

- Frameworks are powerful, but many app developers find them hard to create/use effectively



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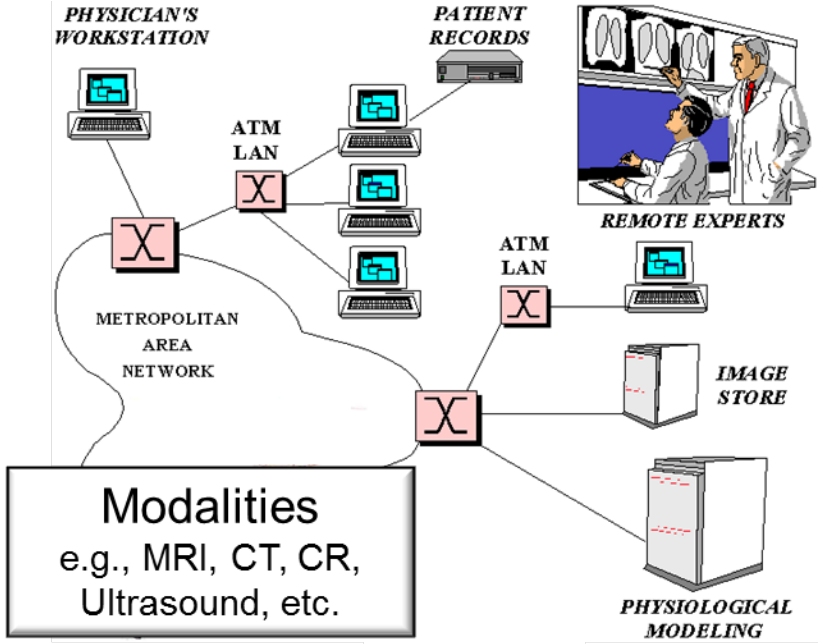
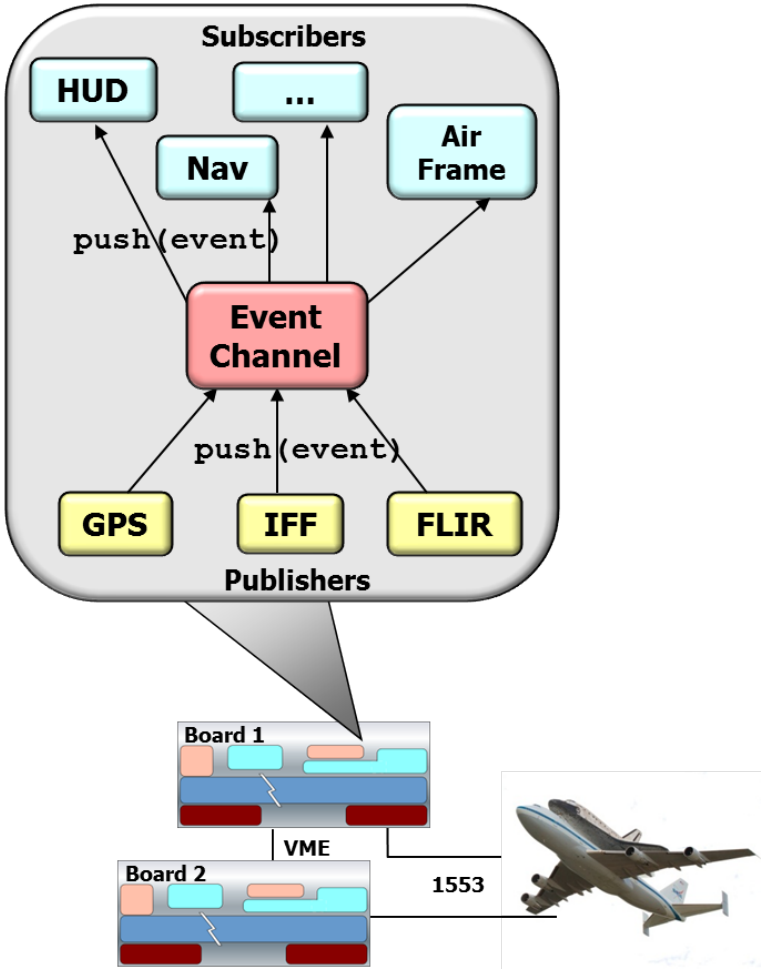
  - Scope/Commonality/Variability analysis requires significant domain knowledge & reusable software development expertise





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```
static int cmpstrs (const void *p1, const void *p2)
{ return strcmp (*(char* const*) p1, * (char* const*) p2); }

static int casecmpstrs (const void *p1, const void *p2)
{ return strcasecmp (*(char* const*) p1, * (char* const*) p2); }

int main(int argc, char *argv[]) {
  int j, icase = *argv[1] == 'i';
  qsort (&argv[2], argc - 1, sizeof(char *),
         icase ? casecmpstrs : cmpstrs);
  for (j = 2; j < argc; ++j) puts(argv[j]);
}
```

Strategy pattern

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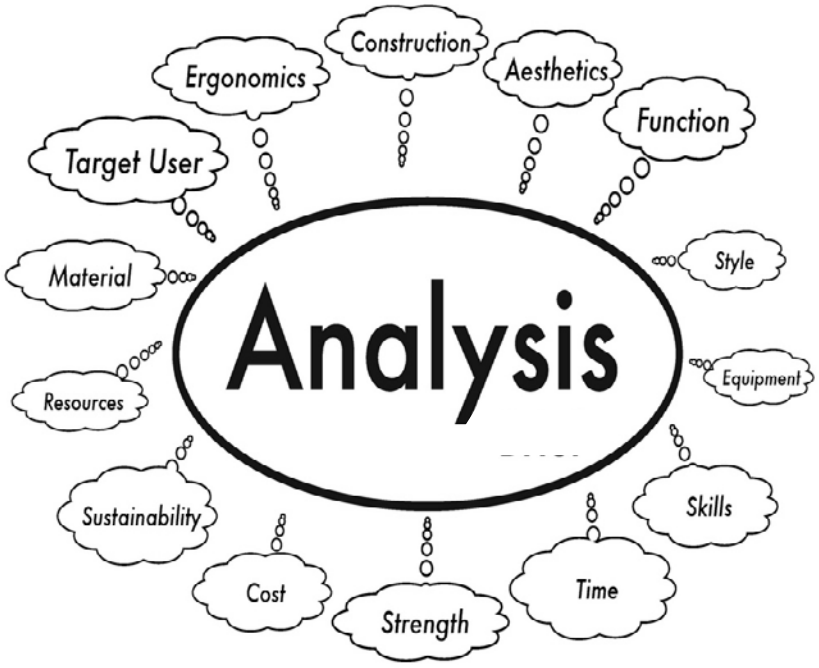

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- Performance may degrade due to complex structures & extra levels of indirection

www.dre.vanderbilt.edu/~schmidt/PDF/Queue-04.pdf has more on frameworks

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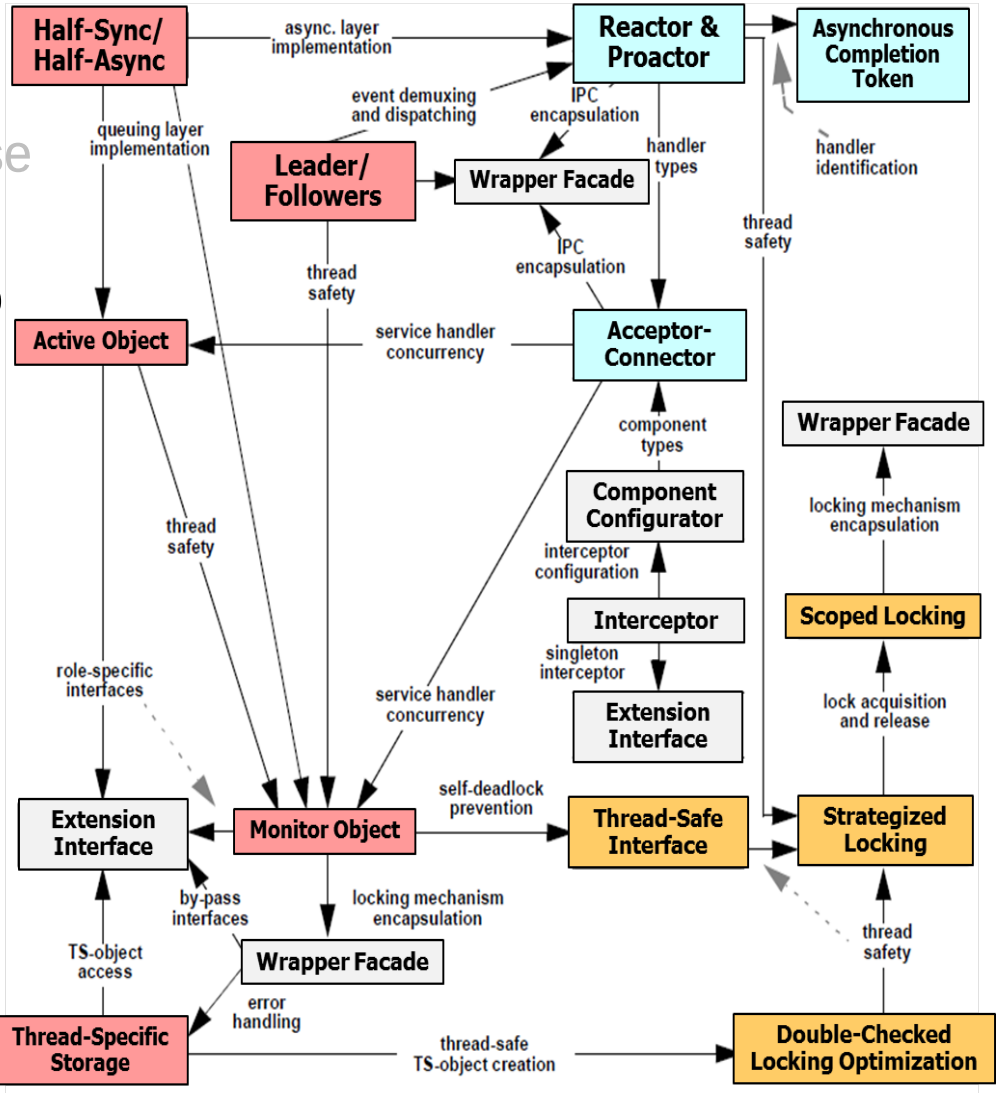
- Understand patterns to learn how to better develop & apply frameworks



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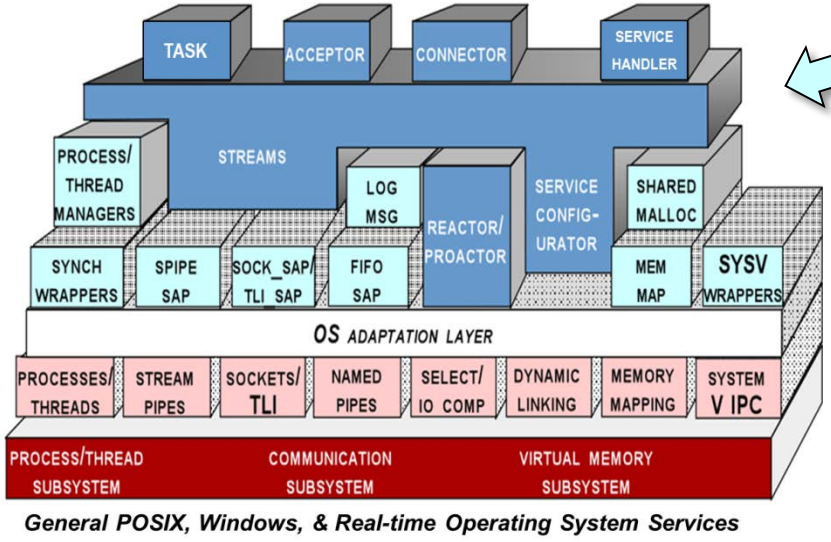

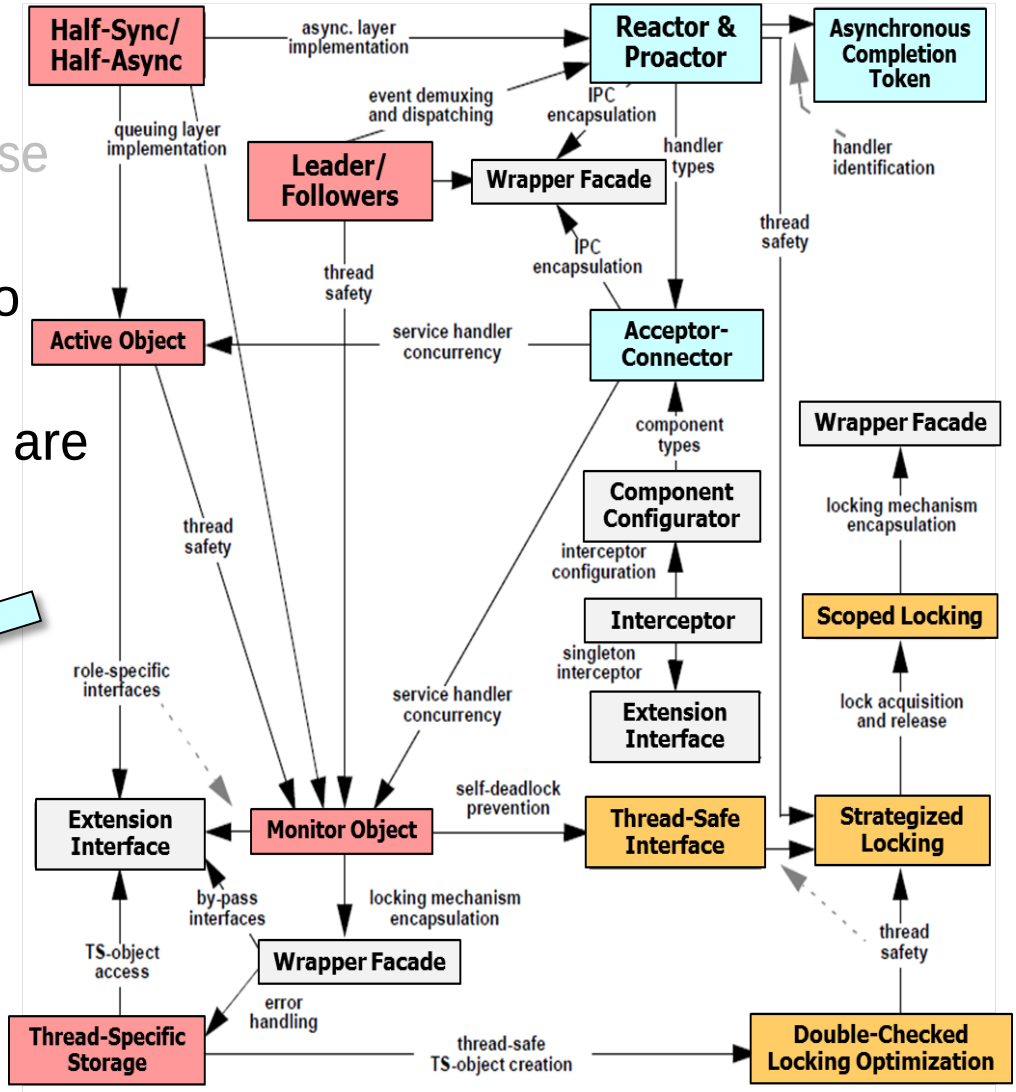

See www.dre.vanderbilt.edu/~schmidt/patterns-ace.html for more info

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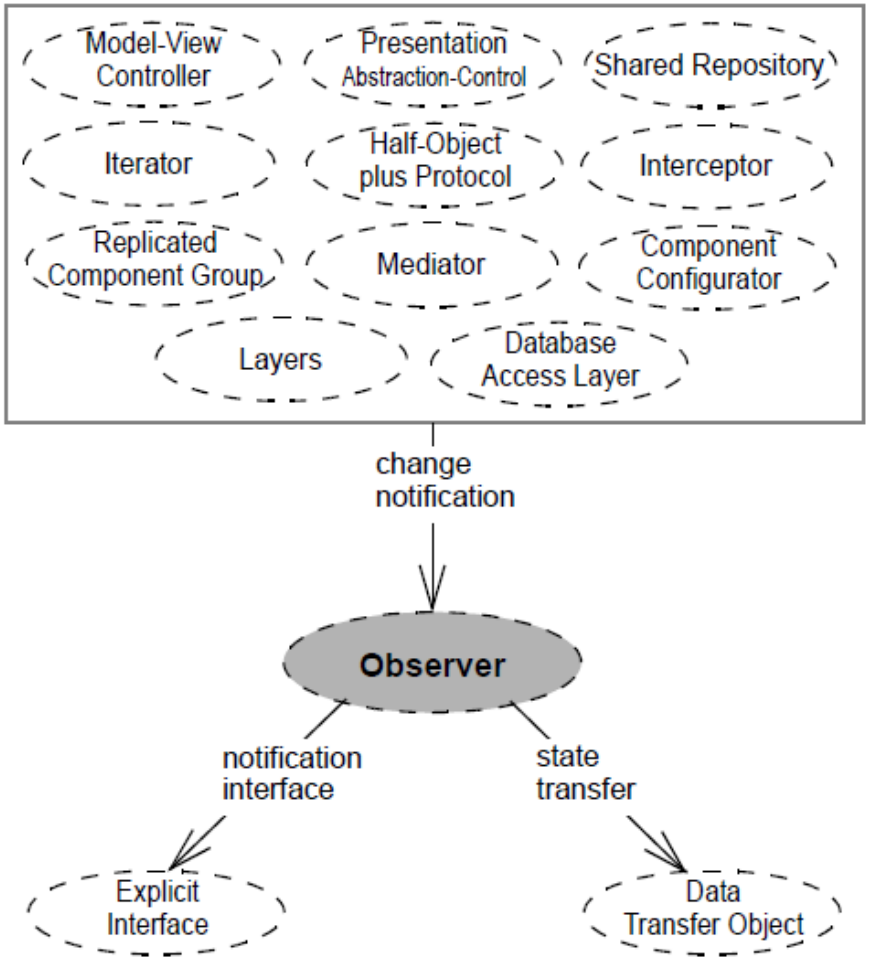

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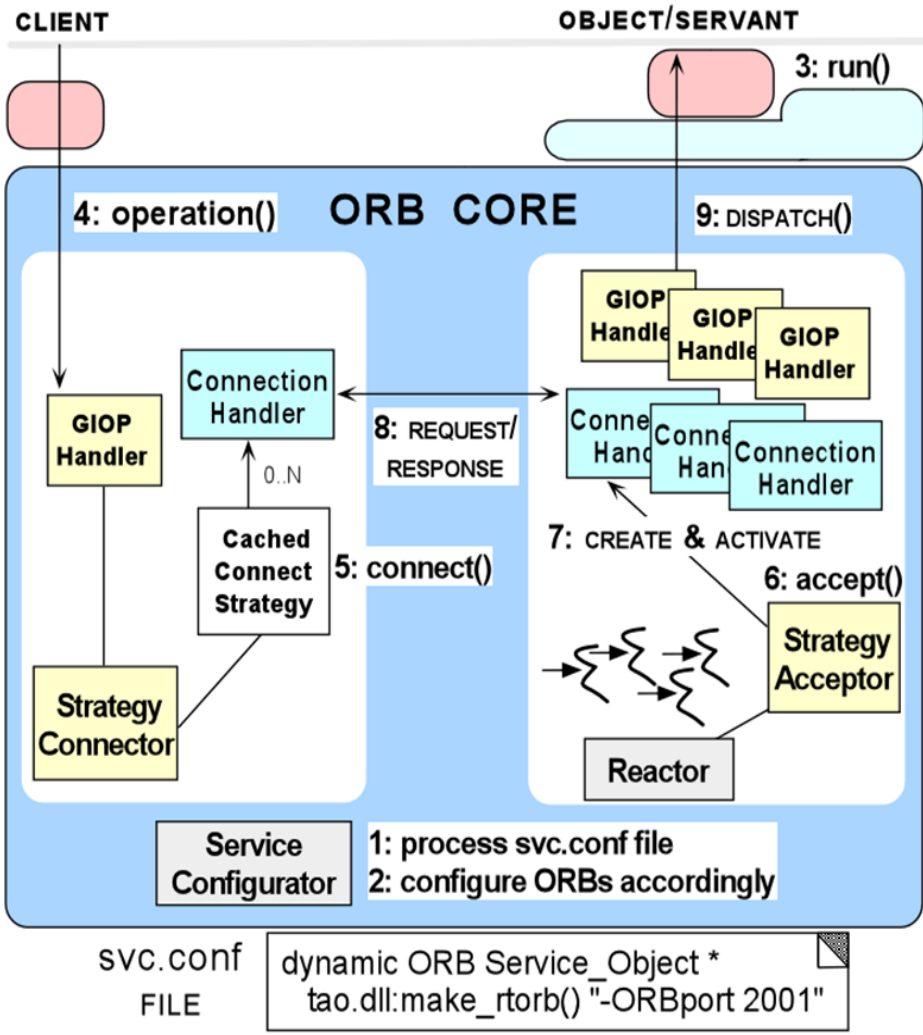

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- Pattern & framework design is even harder than OO design!

Many frameworks limitations can be addressed with knowledge of patterns