



Digital Twins, Embedded SW Rehost and pilot-in the loop :

*A way to reduce integration costs and rework in
Aerospace & Aviation*

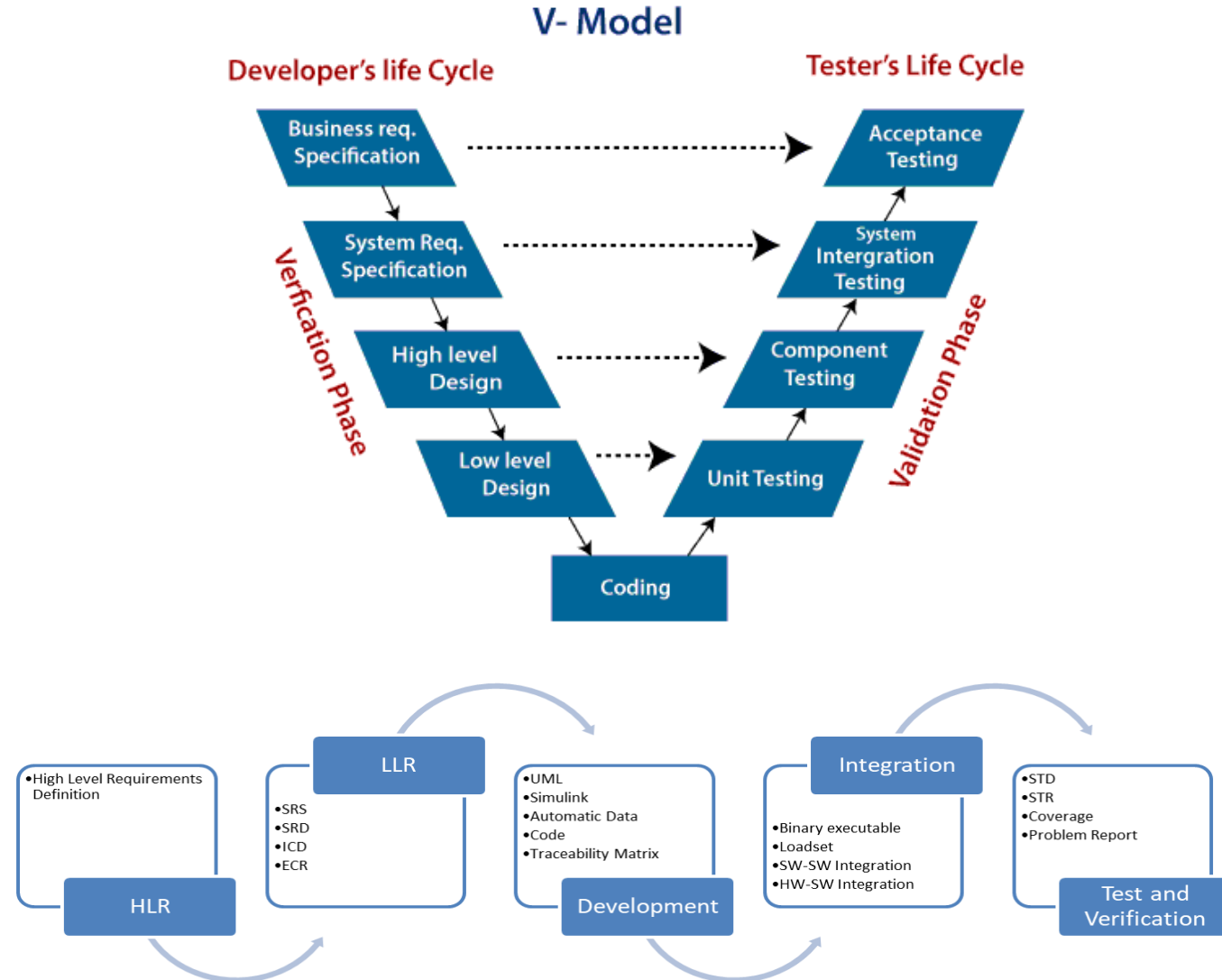
April 2024

Agenda

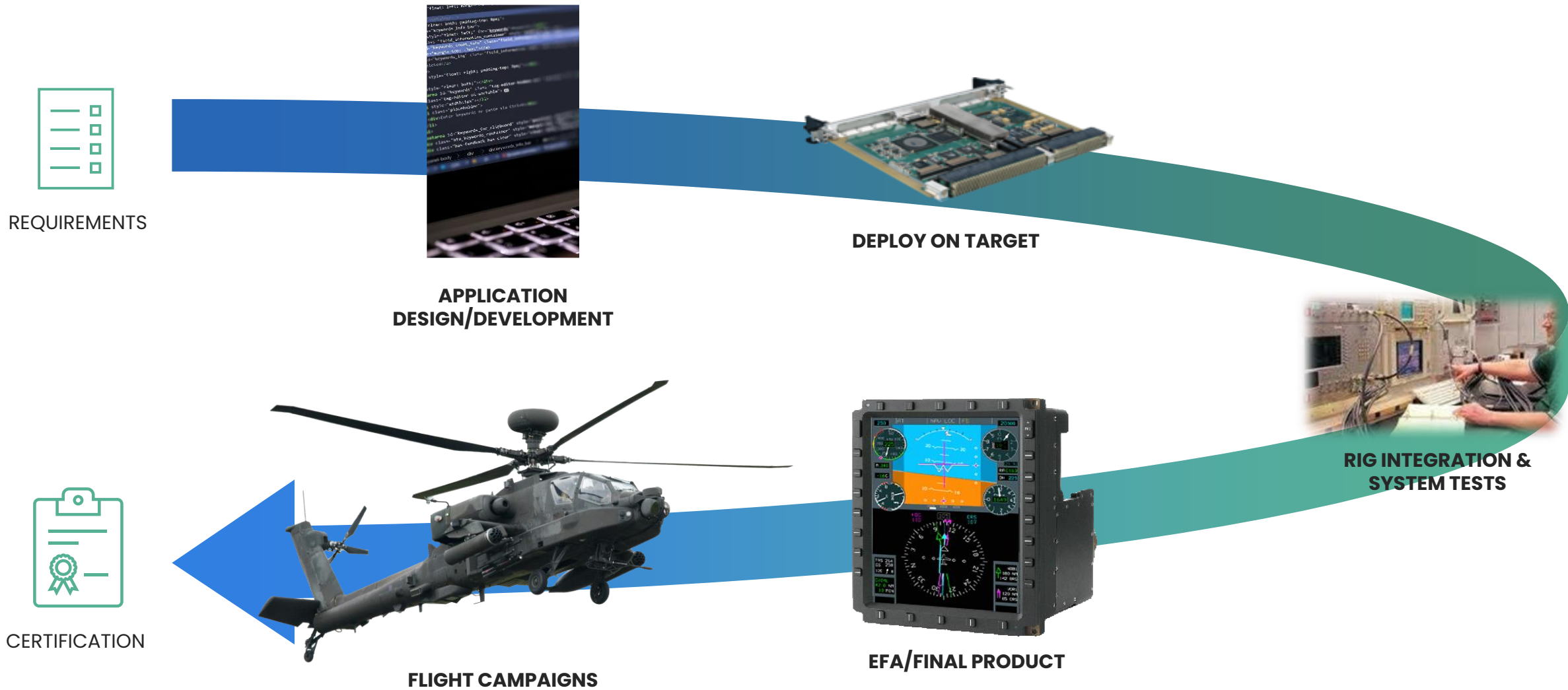
- Development Model
- Traditional Approach
- New Approach
- Conclusion
- Q&A



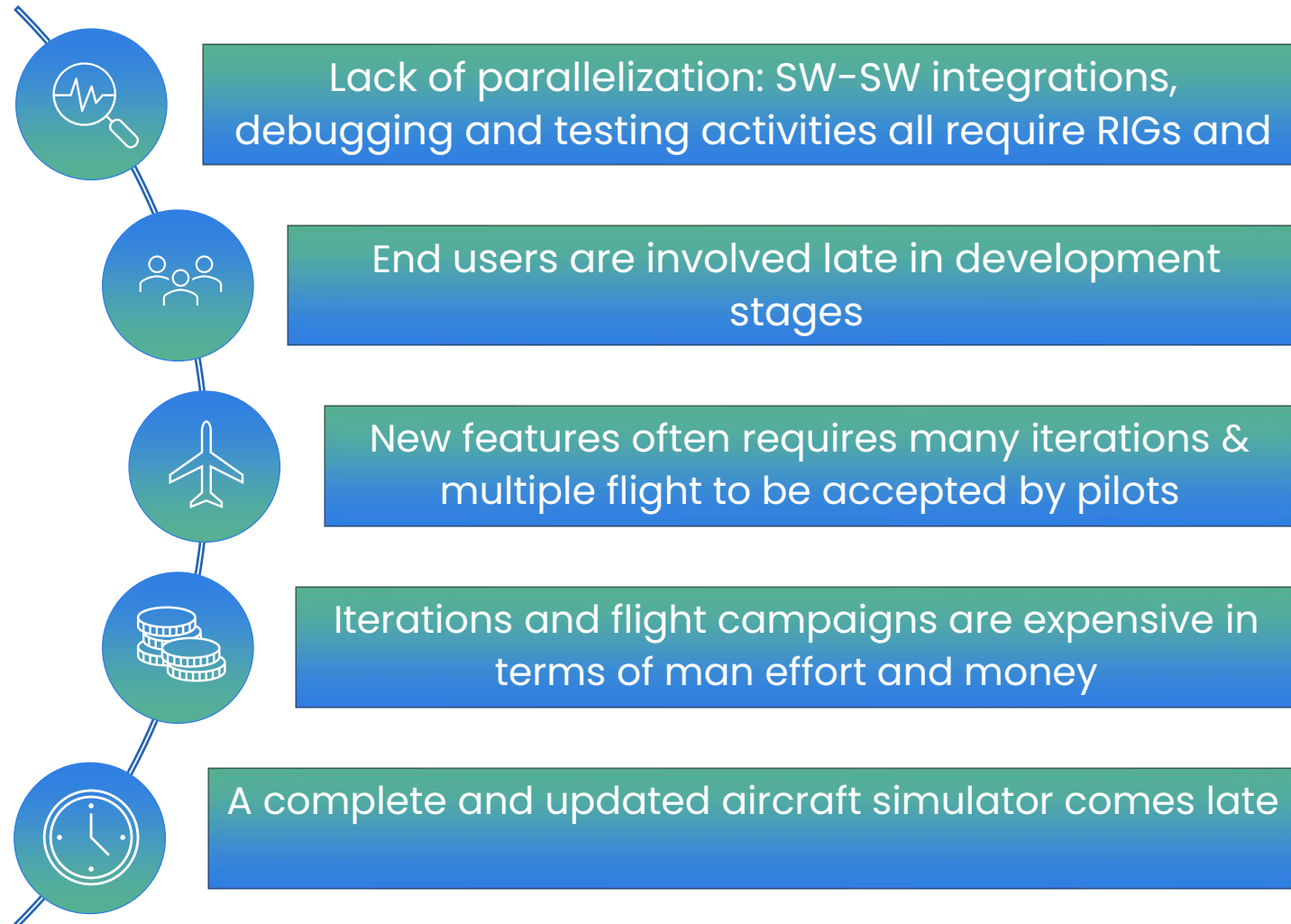
Development Model



Traditional Approach



Weaknesses to Address

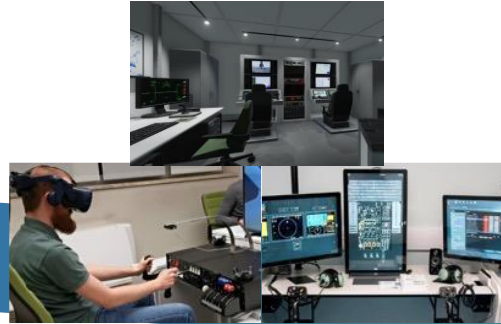


New Approach

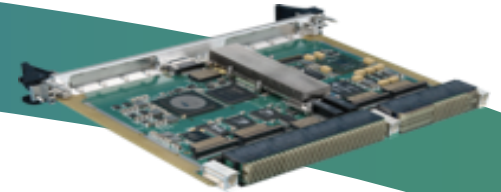

REQUIREMENTS



APPLICATION
DESIGN/DEVELOPMENT



SIMULATION PILOT in the
LOOP



DEPLOY ON TARGET


CERTIFICATION



FLIGHT CAMPAIGNS

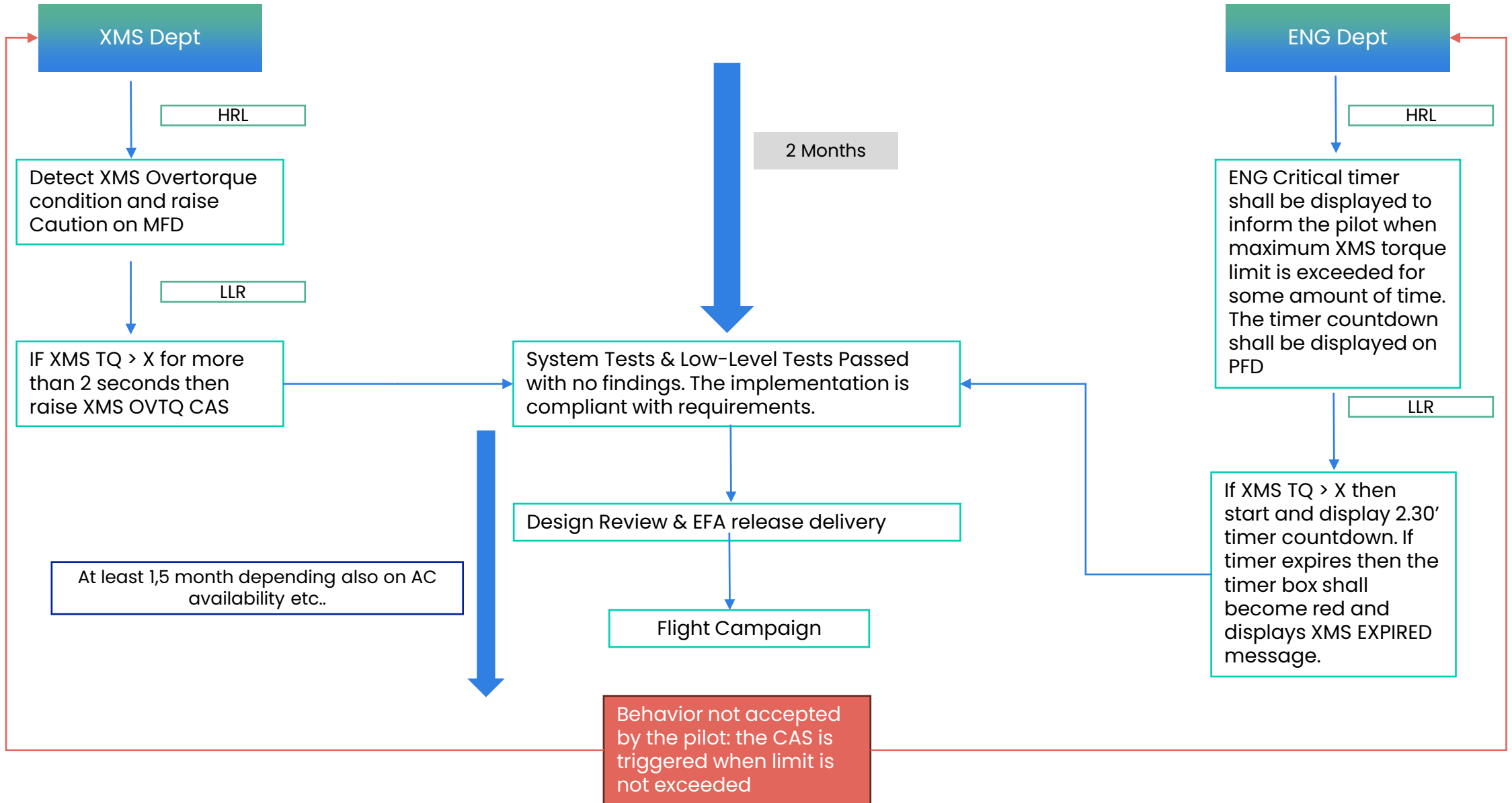


EFA/FINAL PRODUCT



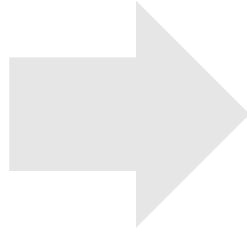
RIG INTEGRATION &
SYSTEM TESTS

A Long Story Short of AC Prototype



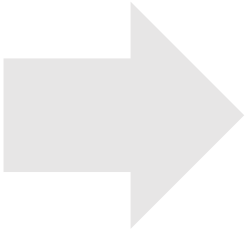
Rehosting Example

- SW APP1 Req
- SW APP1 Dev
- SW APP1 Build



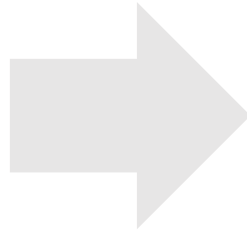
Rehost 1

- SW APPn Req
- SW APPn Dev
- SW APPn Build



Rehost n

Device Models	Environment Models
AC Model	... Model

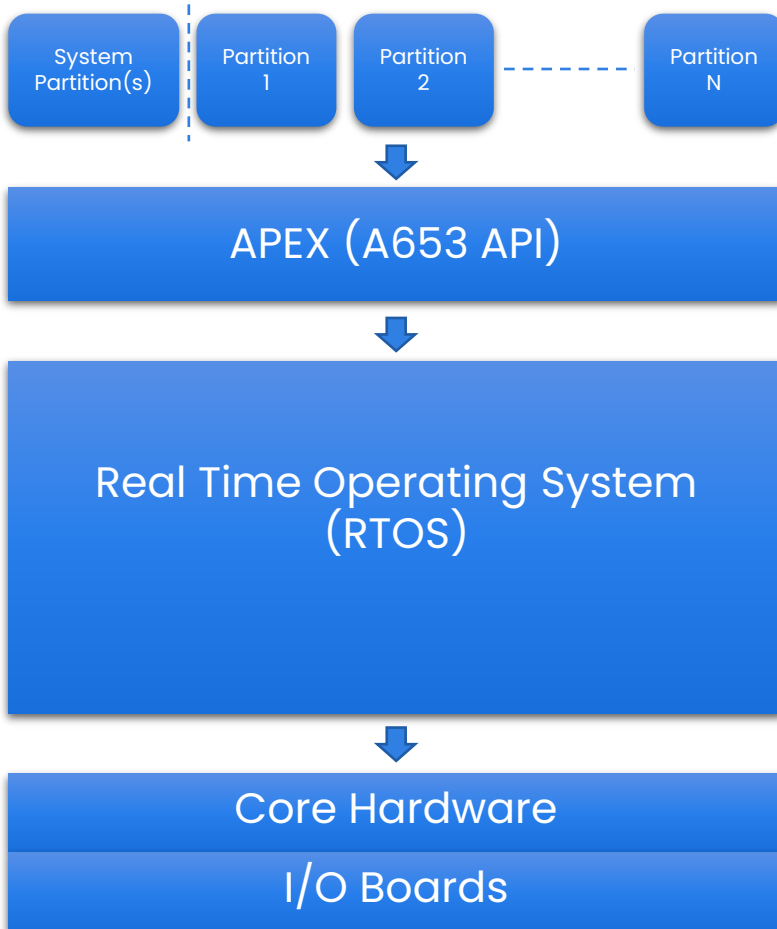


Simulation & Testing BUS

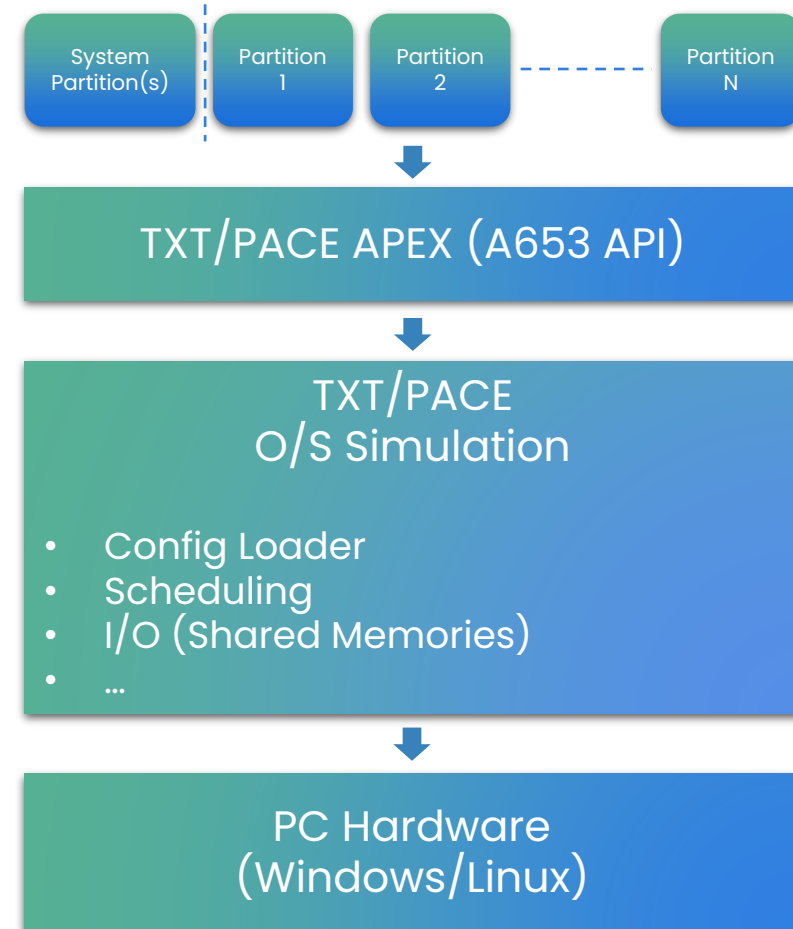


Rehosting HL Architecture

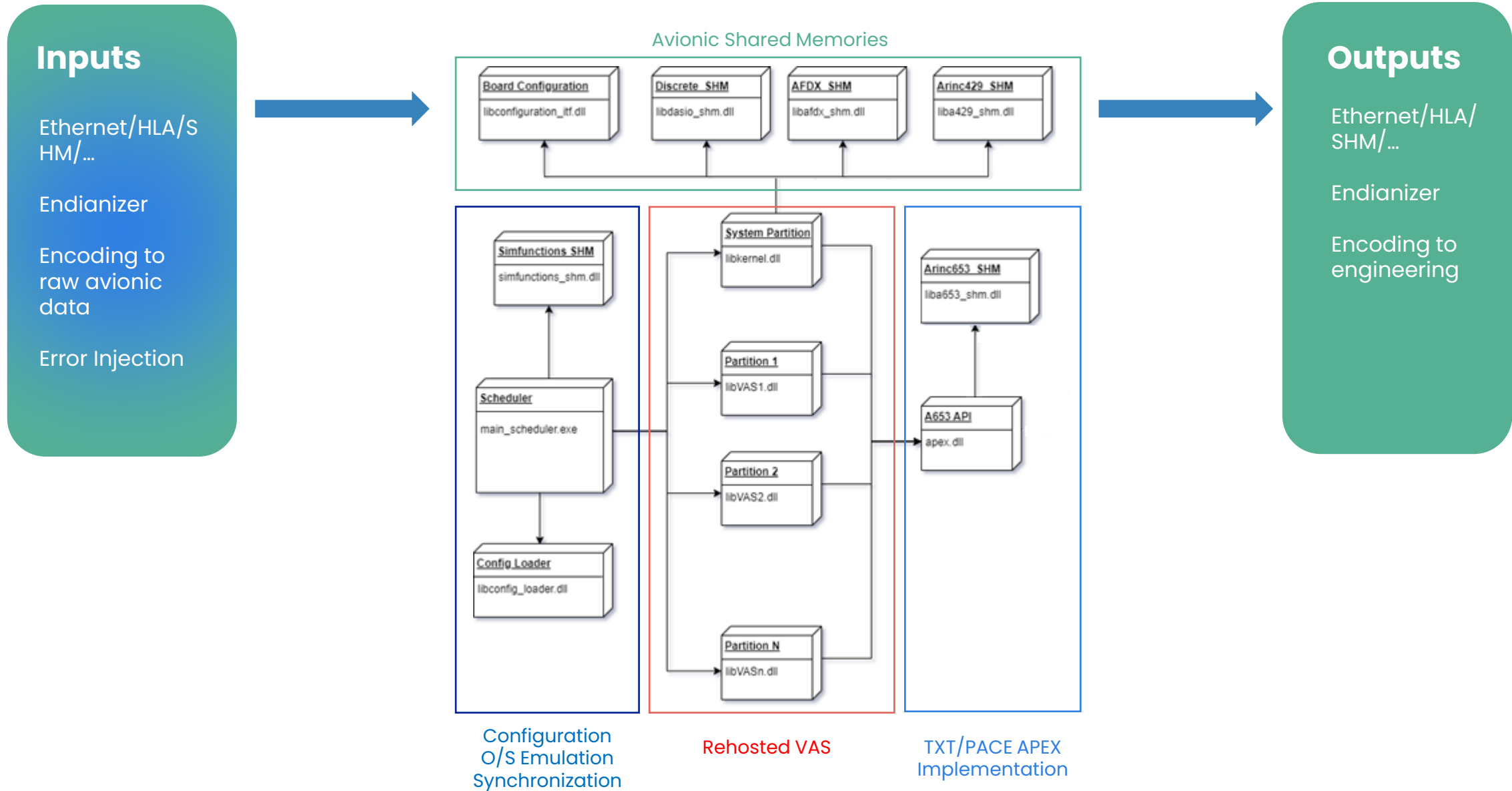
Real Architecture



Rehost Architecture



Rehosting LL Architecture



SWOT

Strengths S

- Involving pilot testing new features is easier & safer
- Quick debug on simulated environment
- Reduce bottlenecks on RIGs & FSIRs
- Support for traditional kernels or modern IMA architectures

Weaknesses W

- Setup a new lab with real equipment requires lot of effort
- RT performance shall be evaluated on real target
- Rehosting activities require high skills

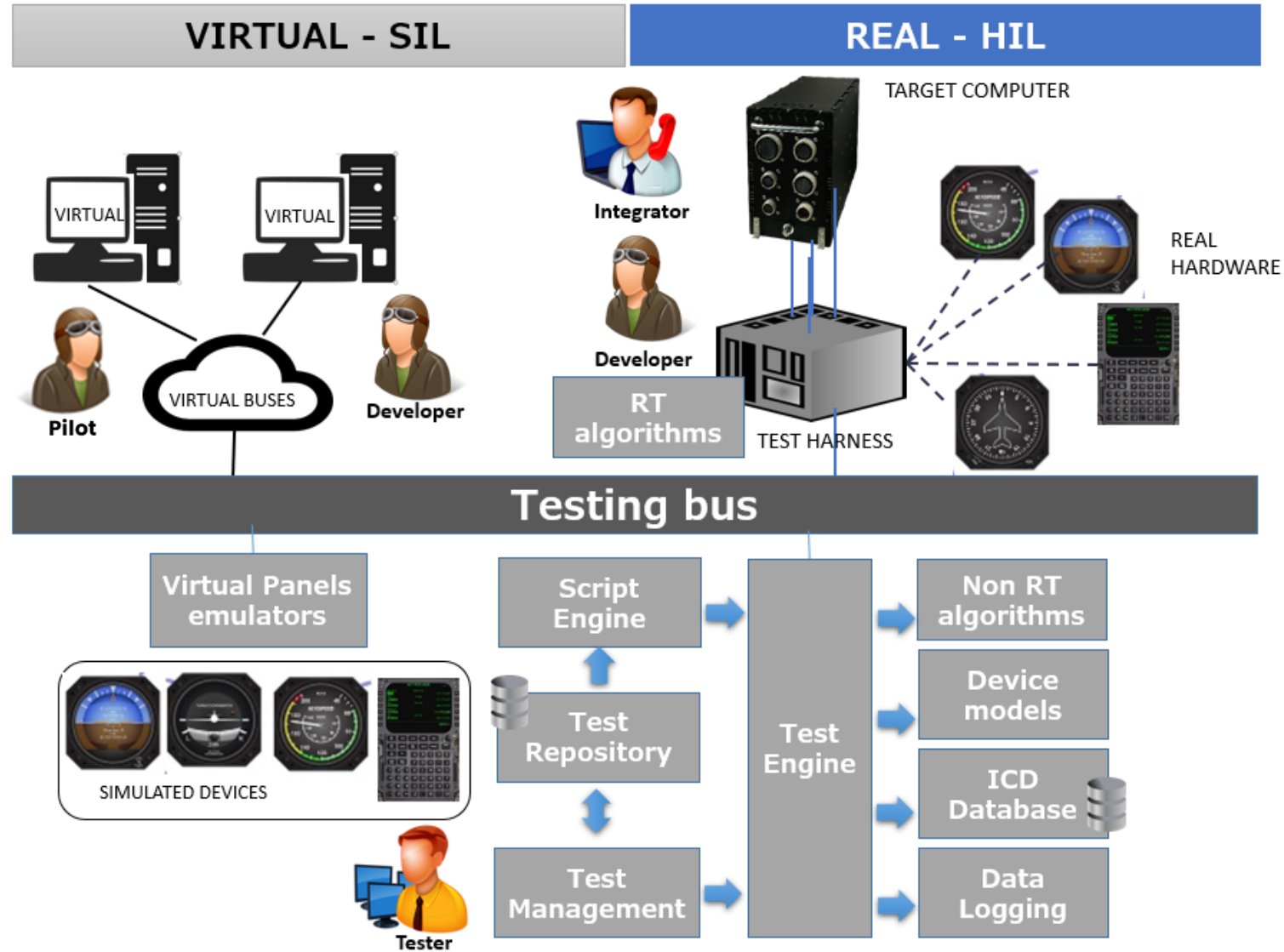
Opportunities O

- Multi AC Simulator
- Connect multiple Simulator
- How to get credit for Cert?

Threats T

- Different development approaches
- Lack or incorrect devices specs
- ICD formats
- Endianess

Scale up to RIG



The background features a complex, abstract pattern of wavy, overlapping lines in various shades of green and blue. These lines are interspersed with numerous small, glowing dots of similar colors, creating a sense of depth and movement. The overall effect is reminiscent of a digital data stream or a network visualization.

Any Questions?



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