



Build versus Buy

For Embedded Flash Controllers

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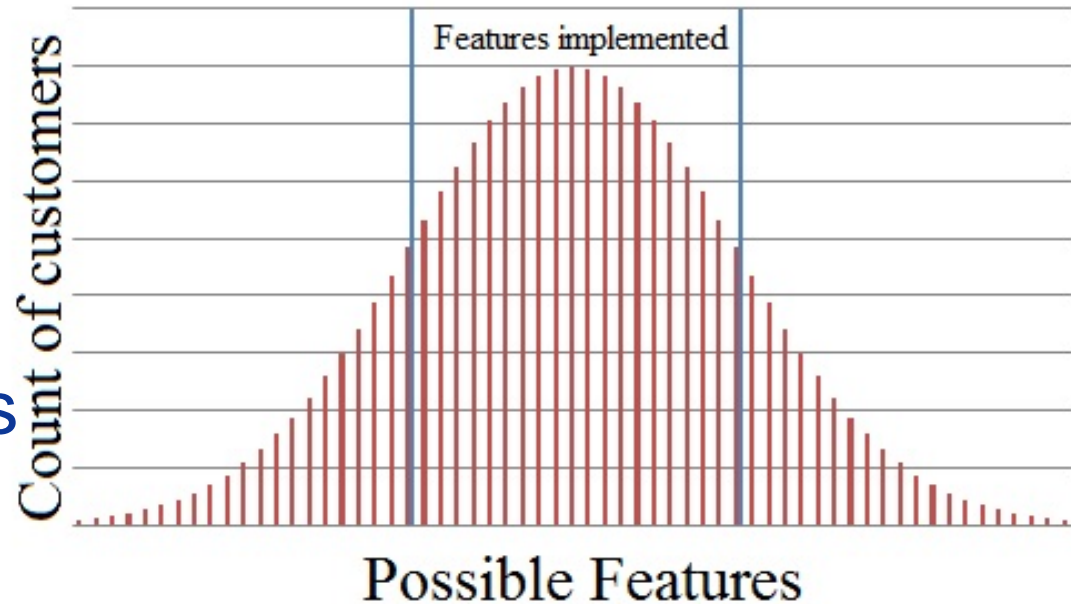
Build versus Buy

- Overview
- Features of off-the-shelf controllers
- Requirements of military and defense
- Conclusion

- Cost
 - Cost to integrate an off-the-shelf flash controller will be much less
 - Developing your own flash controller will cost several man-years of work even for a simple controller

- Time to market
 - Clearly development time will be less if you simply buy a controller
 - Developing your own flash controller may take a calendar year or more
 - You can add additional human resources, but with higher cost

- Features
 - Many controllers aim for a mainstream market
 - Many embedded markets do not need that same set of features, but need specific features not normally found in off-the-shelf controllers



Features of OTS controllers

- NAND flash support
 - Several NAND flash vendors
 - Several geometries and generations
 - Designer can chose what works best

Features of OTS controllers

- Widespread use → widespread testing
 - Well tested in a variety of host systems
 - Usually mainstream host systems, and not embedded systems which are quite different

Features of OTS controllers

- Usually a low-power, low-cost ASIC
- Usually quite fast
- Firmware releases to continually add features
 - However, not usually the features for embedded systems

Req'ments of military and defense

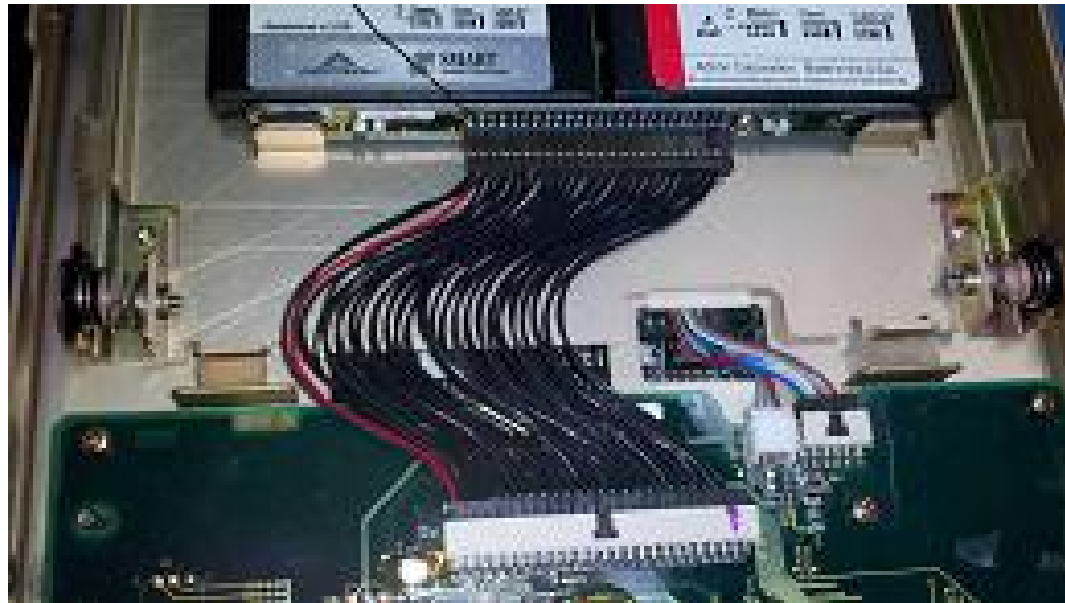
- Security and erase
 - Special sanitization sequences
 - NSA/CSS Manual 9-12
 - RCCTG IRIG 106-13
 - Special certification
 - FIPS 140-2
 - NIAP Protection Profiles

Req'ments of military and defense

- Custom Commands
 - Implement special sanitize procedures
 - Replace legacy storage devices

Req'ments of military and defense

- Adapt to specific embedded host system
 - Home-grown host controllers
 - Unique cabling; not quite standard



Req'ments of military and defense

- Power throttling
 - Erase 1TB in under 10 seconds unless host requests lower power
- Long-term availability
 - Stable firmware, but allow customization

- Off-the-shelf flash controller
 - Lower cost
 - Less development time
 - Features that may not work in embedded
 - Not interested in features for small markets

- SMART High Reliability Solutions
 - Over 20 years of experience in solid-state storage
 - Knows the embedded customers and their requirements well
 - To meet the requirements of our defense/military and ruggedized markets, we need a flexible NAND flash controller



Conclusion

- Only one choice for SMART HRS
 - Build our own controller
- See us in booth #222