IEEE P1581
New Possibilities For Static Component Interconnection Test

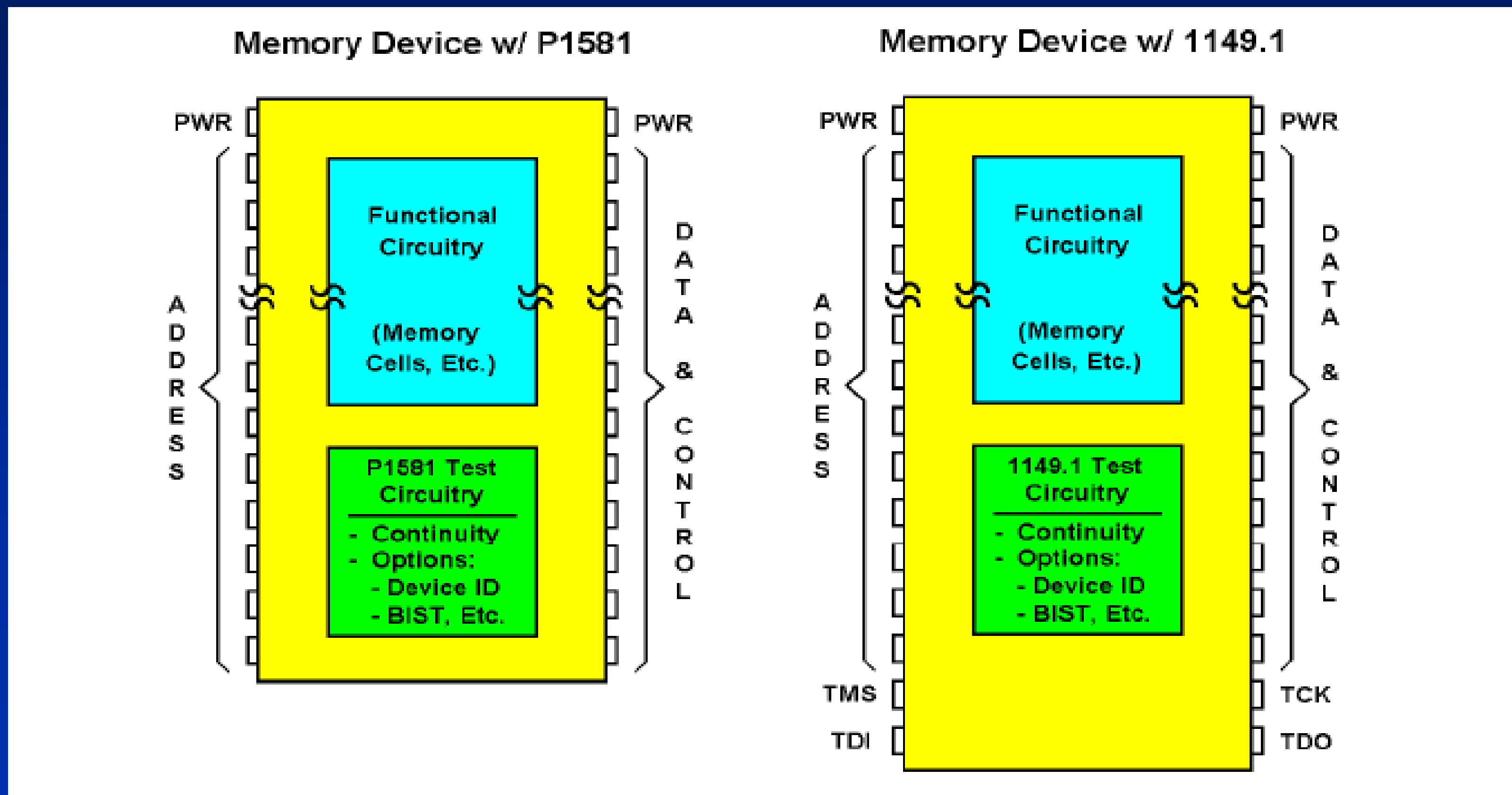
Scott Creekpaum, ASSET Intertech

Outline

- Main features of IEEE P1581
- How can P1581 be used ?
- Who benefits from IEEE P1581 ?

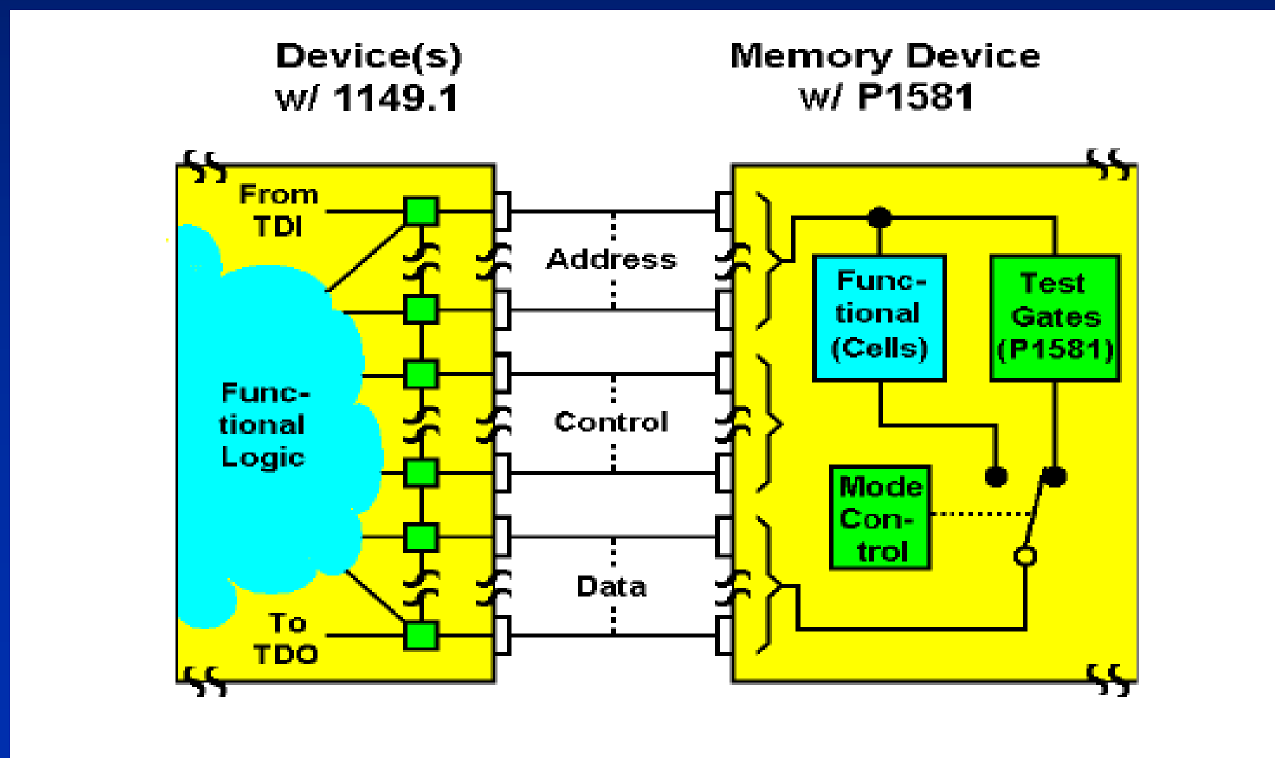
Main features of IEEE P1581

- Test mode entry and exit do not require extra device pins *(optional test pin is permitted)*



Main features of IEEE P1581

- Built-in test logic connects inputs to outputs, bypasses memory cells
- No special dynamic requirements



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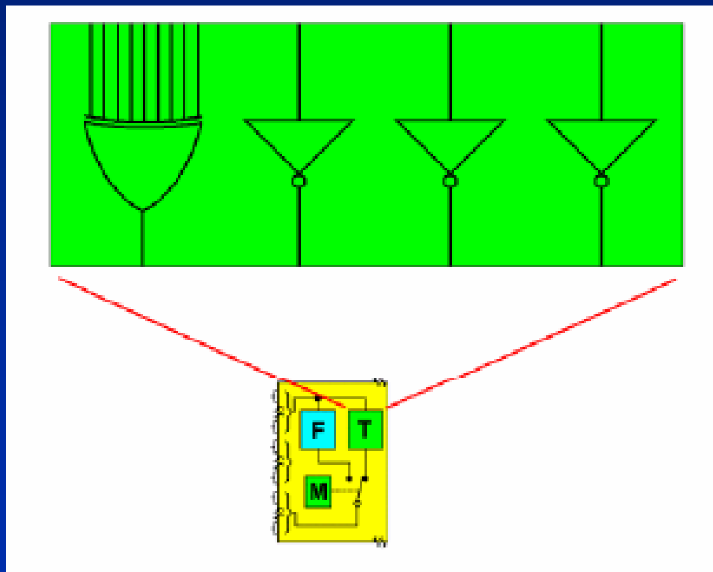
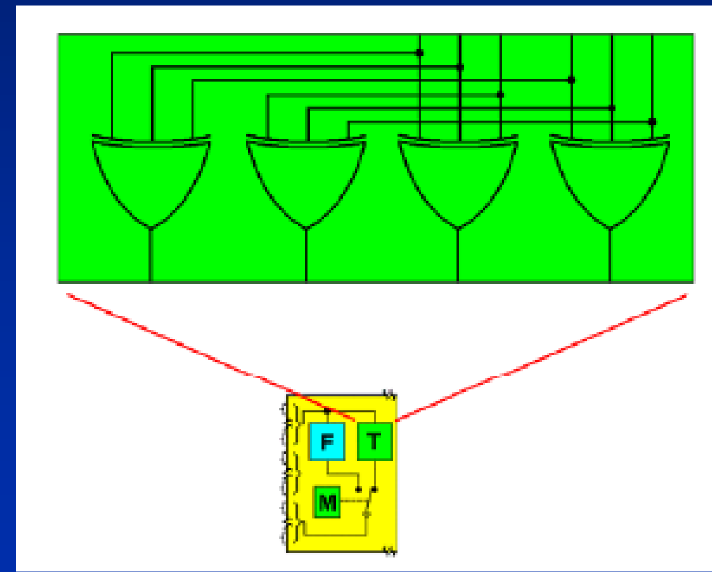
IAX Test Logic

(12 address, 4 data bits)



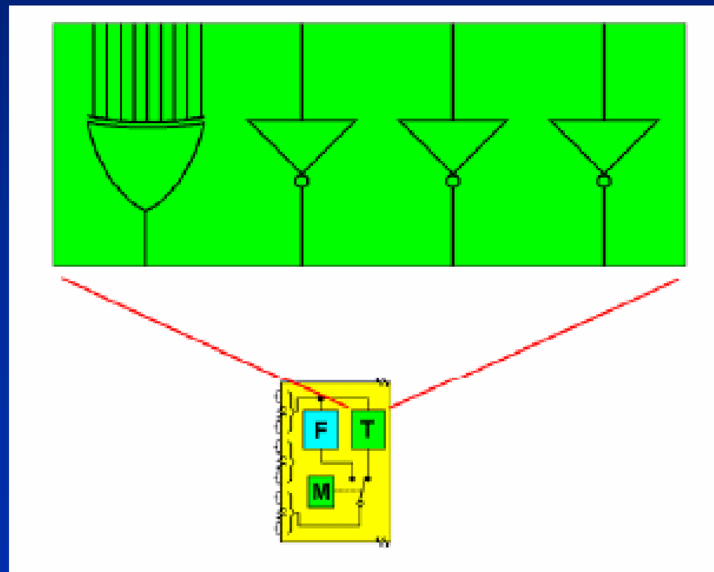
XOR Test Logic

(6 address, 4 data bits)



Main features of IEEE P1581

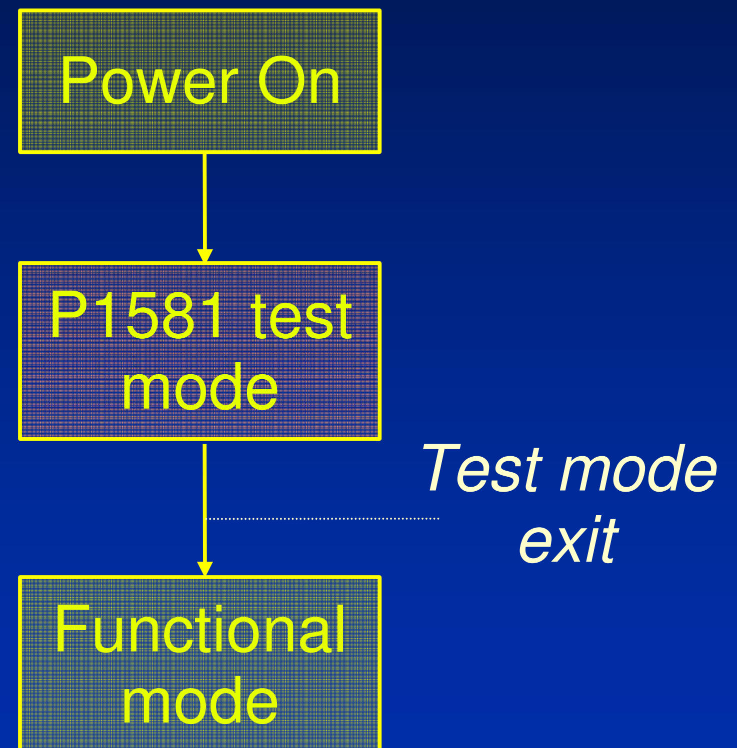
- Very simple test pattern
  - For 12 address bits, complete test could be 26 patterns (all 1's, all 0's, walking 1, walking 0)



Test mode entry / exit methods

(Enhanced) Transparent Test Mode method A:

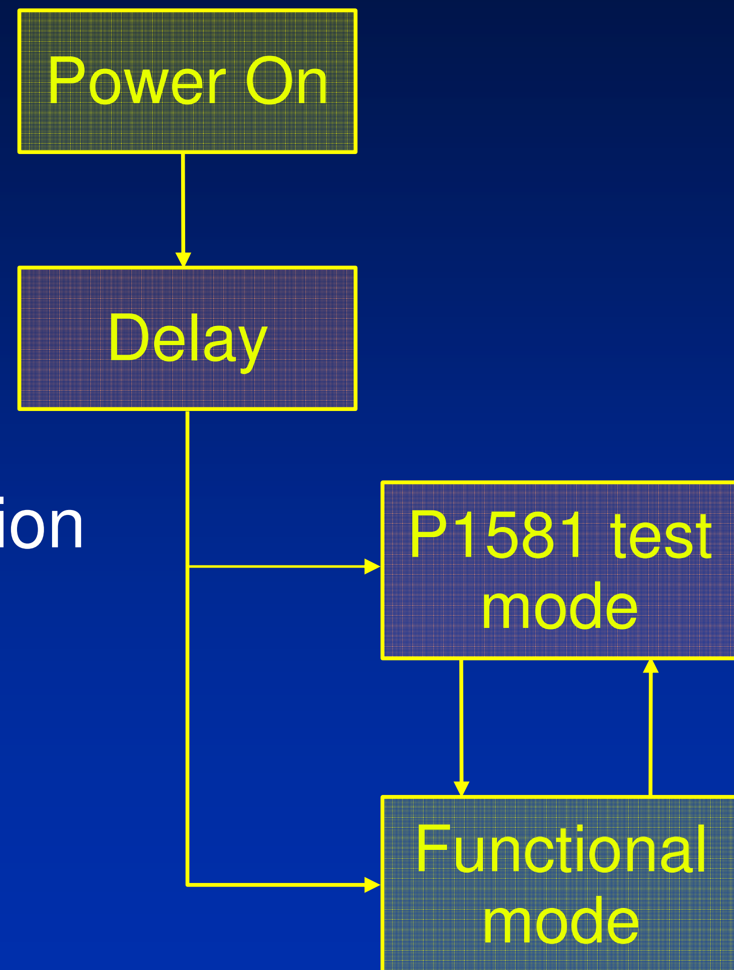
- Device powers up into P1581 test mode
- Exit with first write access after setup time
- Suitable in volatile memory devices



Test mode entry / exit methods

TTM method B:

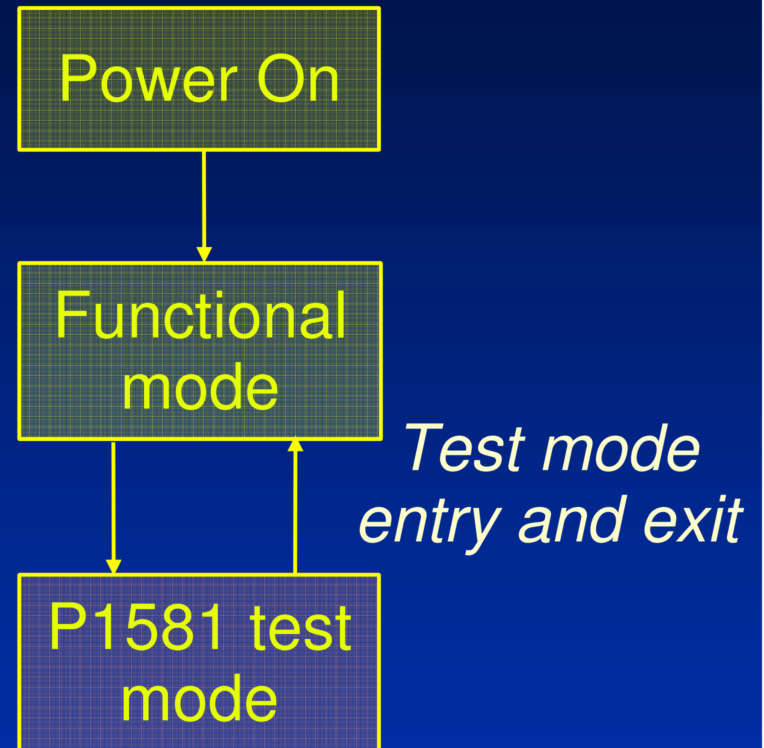
- Delay guarantees stable logic levels on device pins
- Mode selected by input pin state combination after delay
- Exit / Reactivation upon "command"



Test mode entry / exit methods

TTM method C:

- Test mode entry / exit by means of:
  - Specific stimulus
  - Clock frequency shifting
  - Analog level shift
  - ...

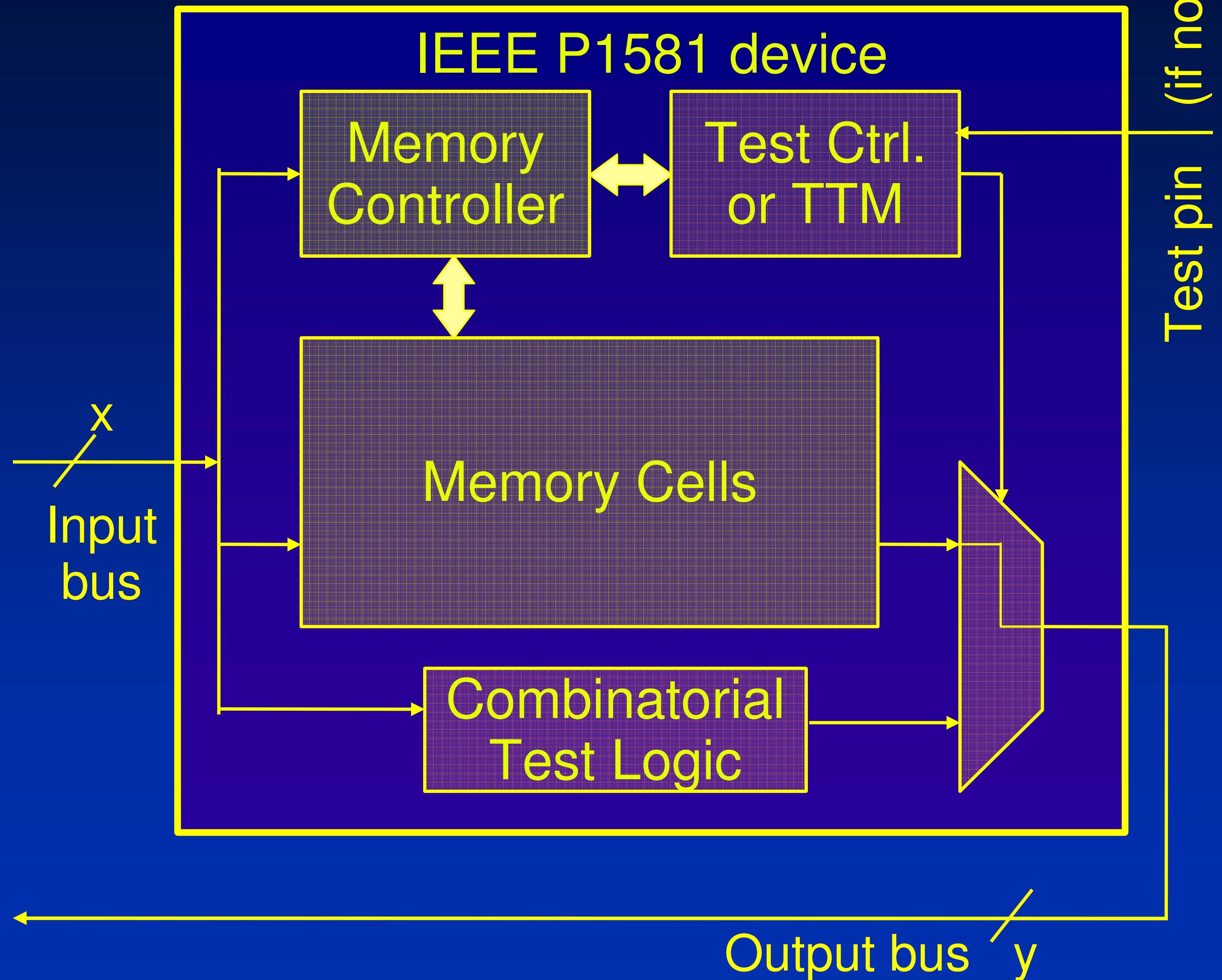


Primary focus of current WG activities

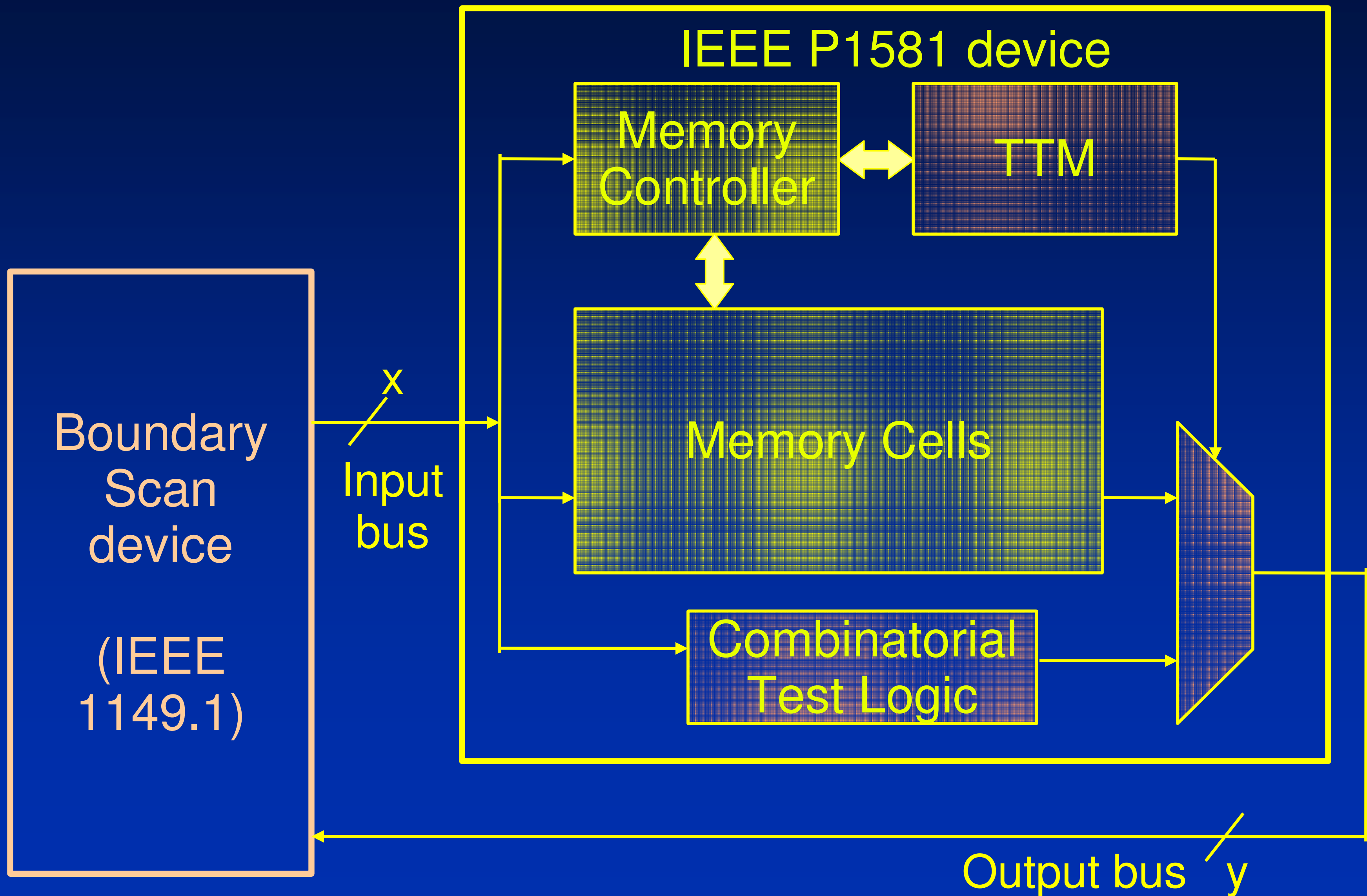
P1581 beyond continuity test

- Continuity test (mandatory)
- Access to device ID
- Self repair
- Built-In Self Test
- Other

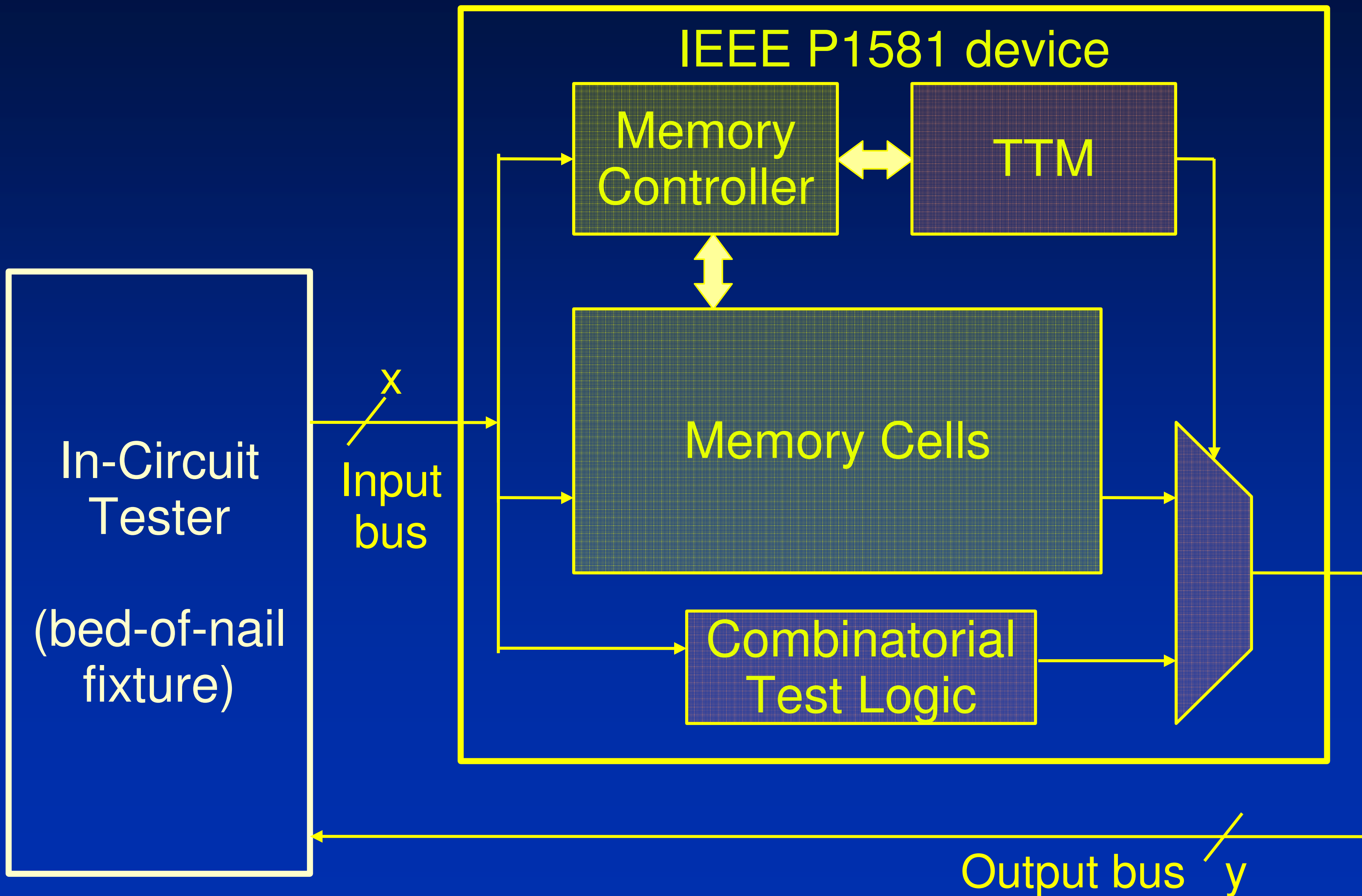
IEEE P1581 principle



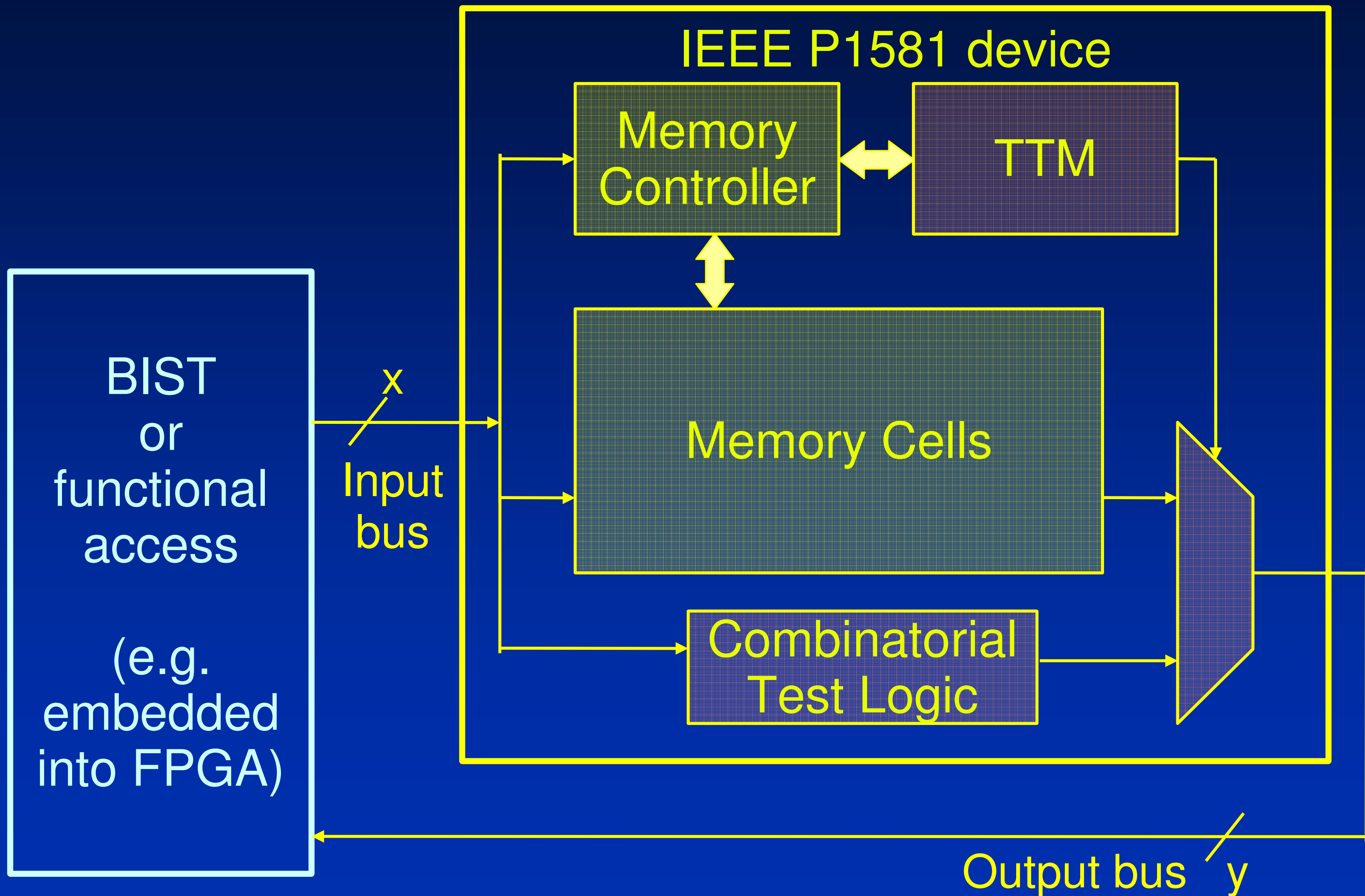
IEEE P1581 principle



IEEE P1581 principle



IEEE P1581 principle



Benefits

- For User:
  - No dedicated test pins required
  - Small test pattern file, shorter test time
  - All memory types can be supported
  - No dynamic requirements
  - Test patterns can be driven from BSCAN device, ICT, functional logic
  - Patterns can be generated by ATPG

Benefits

- For Chip Manufacturer:
  - No dedicated test pins required
  - Reduced test logic (vs. 1149.1)
  - Only one series of devices need to be supported (if P1581 satisfies customer requirements)

Conclusion

- IEEE P1581:
  - Enables new test applications
  - Improves existing test applications
  - Simple implementation, little overhead
  - Simple test pattern (resulting in small test programs)
- P1581 working group is soliciting input from Chip vendors

http://grouper.ieee.org/groups/1581/