



# VMM-Enabled VIP & Verification Planning

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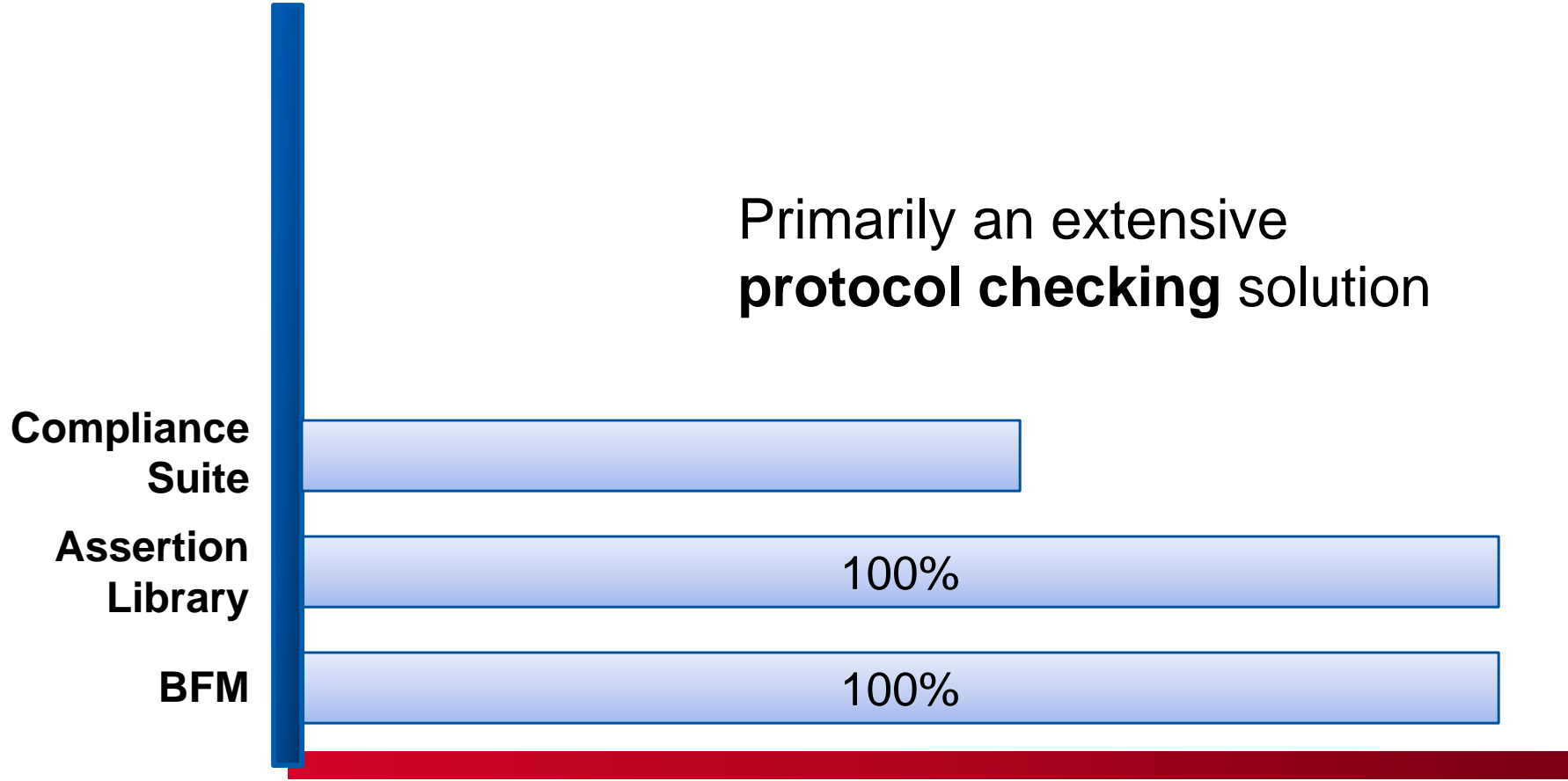


# Denali VMM-based VIP

 PCI Express Gen1/2/3, IOV	 USB 2.0, OTG, 3.0	 Serial ATA 2.0, 3.0	 CE-ATA 2.0, 3.0
 Ethernet 10/100/1G/10G	 PLB 4, 6	 OCP 2.2	 SDIO 2.0
 AMBA AXI, AHB, APB	 SystemRDL	 DFI 1.0, 2.0, 2.1	All Memory Devices

- Encapsulates massive investment in protocol knowledge
- 100+ active VMM projects
- New protocols:
  - PCIe 3.0
  - USB 3.0
  - PLB 6

# Denali Verification IP Capabilities

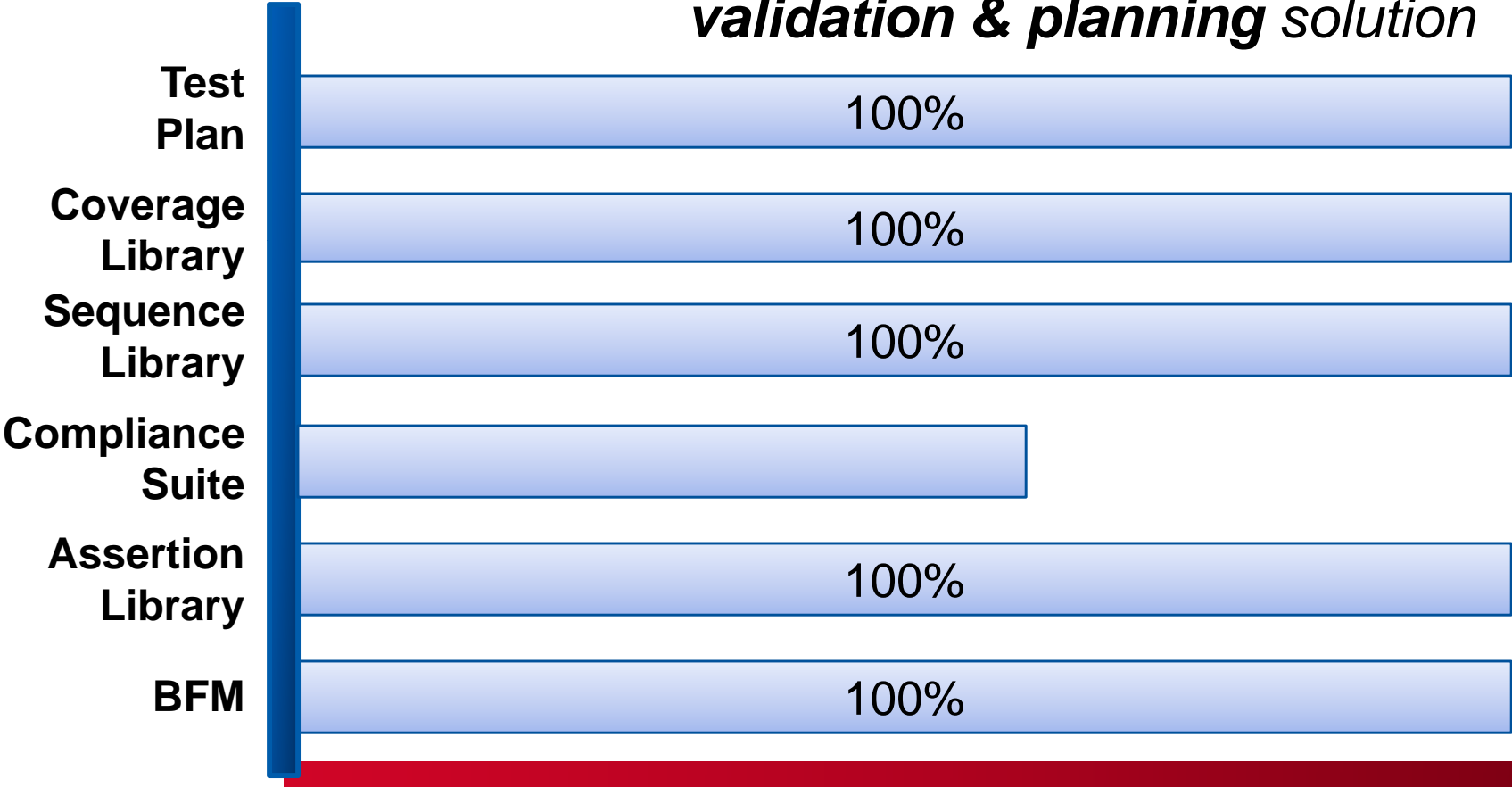


**Protocol Coverage**



# Denali Verification IP Capabilities

*Now, a comprehensive **protocol validation & planning** solution*



**Protocol Coverage**



# Importance of Verification Planning

- **Transparency and objectivity are key**
- **Goals for verification planning**
  - Capture concerns of each stakeholder in a single document
  - Ensure all stakeholders have same interpretation of product intent
  - Set and track objective goals
  - Know when finished
  - Automate status reporting
- **Growing number of verification stakeholders**

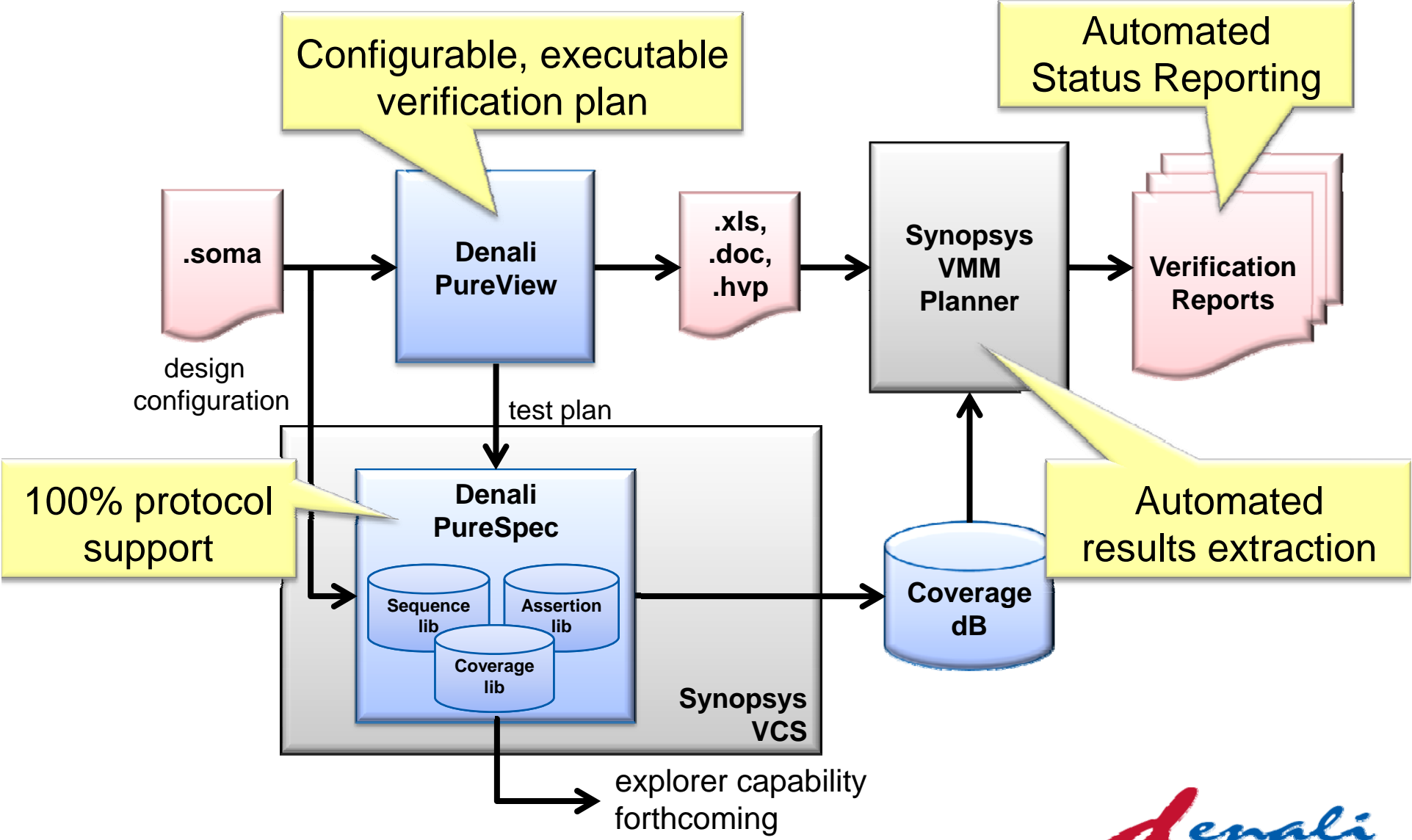


Verification Planning Before



Verification Planning Now

# Planning with Denali & VMM Planner



# Sample Test Plan

*Transparency and objectivity for all verification stakeholders*

hvp plan	pcie	feature	feature	\$weight	value	pcie.Group	measure	pcie.source	Sowner
plan				1	69.23%				
		LTSSM State		1	69.23%				Denali
		L0_To_L2		1	0.00%	group bin: *LtssmStateCg.LtssmTrans.L0_To_L2			Denali
		L0_To_TxL0s		1	100.00%	group bin: *LtssmStateCg.LtssmTrans.L0_To_TxL0s			Denali
		RxL0sEntryTxL0sIdle_To_RxL0sIdleTxL0sIdle		1	100.00%	group bin: *LtssmStateCg.LtssmTrans.RxL0sEntryTxL0sIdle_To_RxL0sIdleTxL0sIdle			Denali
		RxL0sIdleTxL0_To_RxL0sFtsTxL0		1	100.00%	group bin: *LtssmStateCg.LtssmTrans.RxL0sIdleTxL0_To_RxL0sFtsTxL0			Denali
		RxL0sIdleTxL0sFts_To_RxL0sIdleTxL0		1	100.00%	group bin: *LtssmStateCg.LtssmTrans.RxL0sIdleTxL0sFts_To_RxL0sIdleTxL0			Denali
		RxL0sIdleTxL0sIdle_To_RxL0sFtsTxL0sFts		1	0.00%	group bin: *LtssmStateCg.LtssmTrans.RxL0sIdleTxL0sIdle_To_RxL0sFtsTxL0sFts			Denali
		RxL0sIdleTxL0sIdle_To_RxL0sFtsTxL0sIdle		1	0.00%	group bin: *LtssmStateCg.LtssmTrans.RxL0sIdleTxL0sIdle_To_RxL0sFtsTxL0sIdle			Denali
		RxL0sIdleTxL0sIdle_To_RxL0sIdleTxL0sFts		1	100.00%	group bin: *LtssmStateCg.LtssmTrans.RxL0sIdleTxL0sIdle_To_RxL0sIdleTxL0sFts			Denali
		RxL0sFtsTxL0_To_L0		1	100.00%	group bin: *LtssmStateCg.LtssmTrans.RxL0sFtsTxL0_To_L0			Denali
		RxL0TxL0sEntry_To_RxL0TxL0sIdle		1	100.00%	group bin: *LtssmStateCg.LtssmTrans.RxL0TxL0sEntry_To_RxL0TxL0sIdle			Denali
		RxL0TxL0sIdle_To_RxL0sEntryTxL0sIdle		1	100.00%	group bin: *LtssmStateCg.LtssmTrans.RxL0TxL0sIdle_To_RxL0sEntryTxL0sIdle			Denali

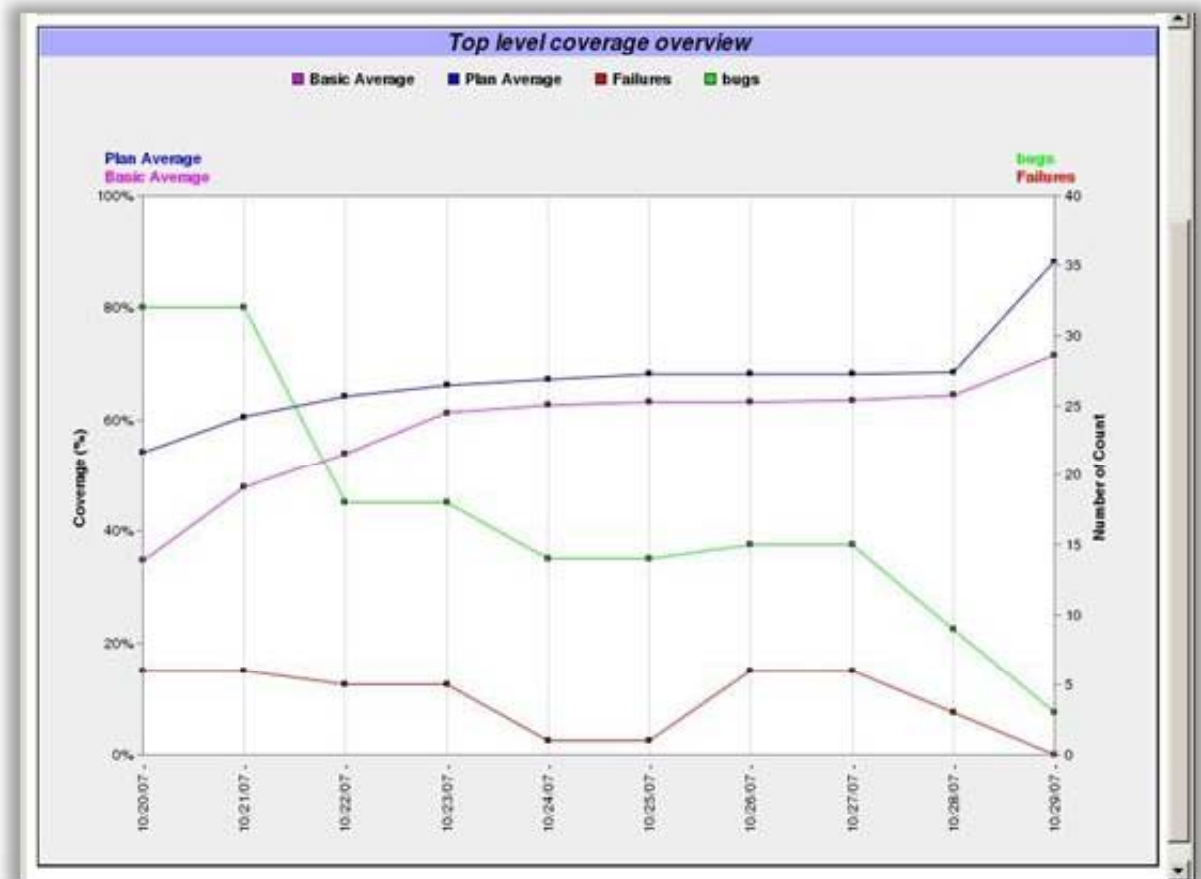
## ➤ Configurable, Executable Verification Plan

- Feature hierarchy in Excel, Word, text
- Easy inclusion of sub-plans

# Automated Status Reporting

*Transparency and objectivity for all verification stakeholders*

- Web page, Excel, Word, or GUI
- Detailed and trend analysis



# Denali Integration with VMM Planner

## Benefits:

- Leverages Denali expert protocol knowledge
- Identify risks and challenges earlier
- Improve verification (and design) quality
- Increase productivity