

Trinity/BOS POR Update

May 2025

April 8th , 2025



Agenda / Summary

Summary:

Tensix Trinity B0 schedule update has completed and been communicated to BOS. Bounding box is updating to reflect schedule, latest area, performance, frequency, and others. This update also refreshes plans for BOS A0 silicon, and B0 Software requirements.

Agenda:

- POR Change Request Summary
- Trinity Status
- N1 Project status
- New Drop schedule
- Other considerations

Decision Requested: Approve POR update for Trinity delivery to BOS

R:

A: Jim

C: Stakeholder list

I: PDRF

Stakeholder Sign-Off

Name	Role	Approved?	Comment
Aniket Saha	IP Prod Mgmt		
Jason Gunderson	PMO		
Stan Sokorac	Tensix IP		
TBD			

Tensix NEO Trinity (BOS) -IP Bounding Box (BB Template R0.2)

Bounding Box

Item		POR* Working Target	Proposed Change	Trend	Status	Comments
SCHEDULE	Limited Access (LA)					
	Early Access (EA)					
PROGRAM COST	Limited Access					
	Early Access					
DIE SIZE						
FREQUENCY	CHIP					
PERFORMANCE	SPECint 2006					
POWER	Dhrystone					
	Virus					
FEATURES						
Is this a FUSA product		YES	YES			

Schedule Update - Trinity IP for BOS B0 Tapeout

<Eric to add schedule slide>

Business Update

<Aniket>

Update on BOS, Siemens, BMW platform and timeline. Impact (if any communicated) to BOS overall plans with schedule delay.



Backup



Tensix NEO for Automotive

Configuration Licensed for Automotive Applications

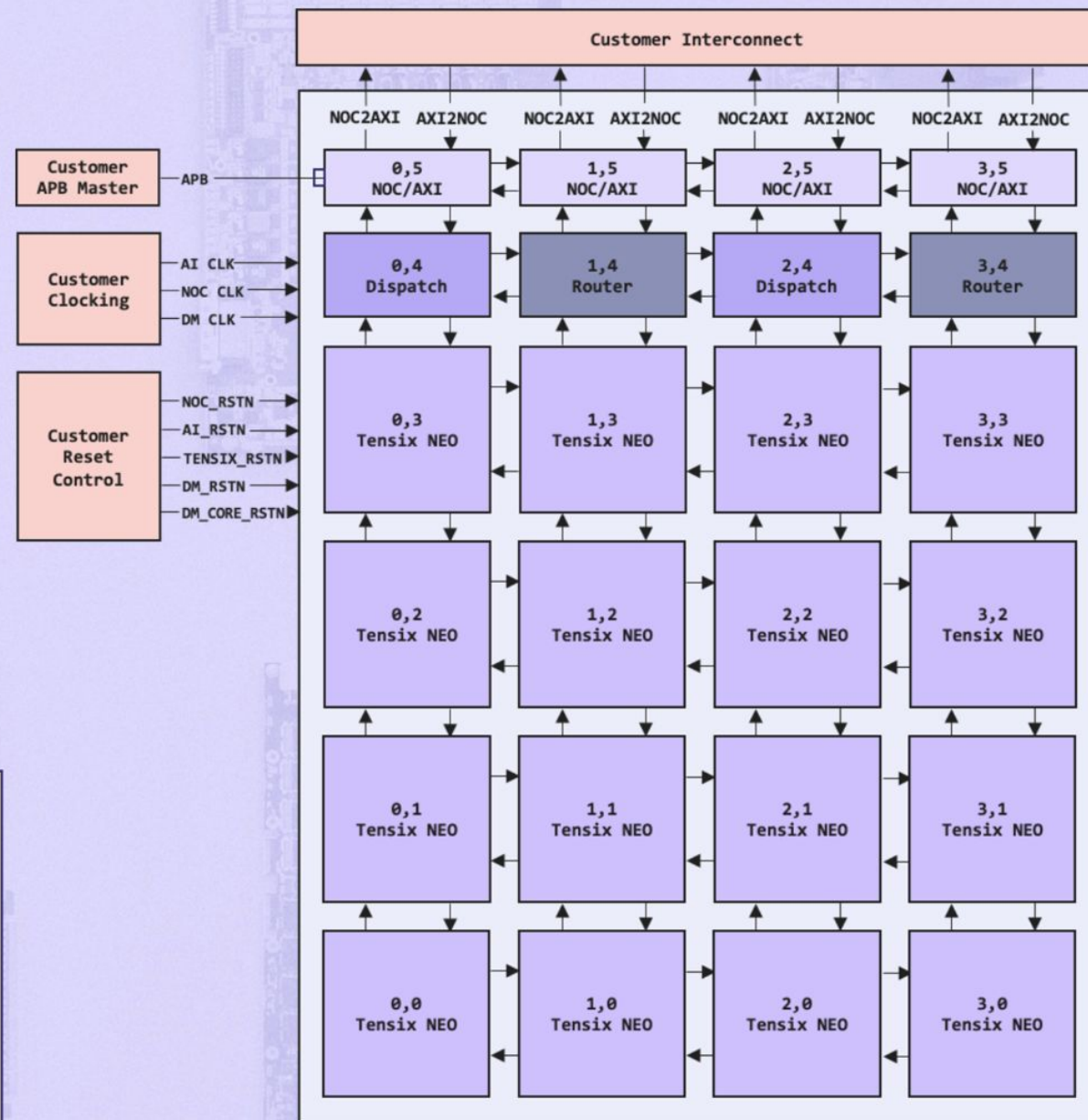
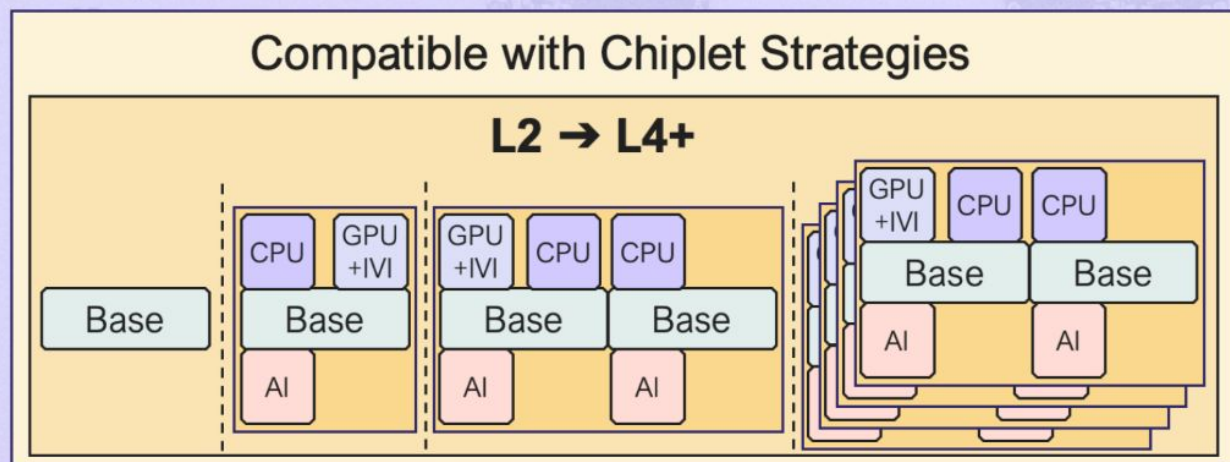
- ADA
- IVI / Cockpit

Scalable Architecture

- Multiple configurations target low- to high-end

Software Compatibility

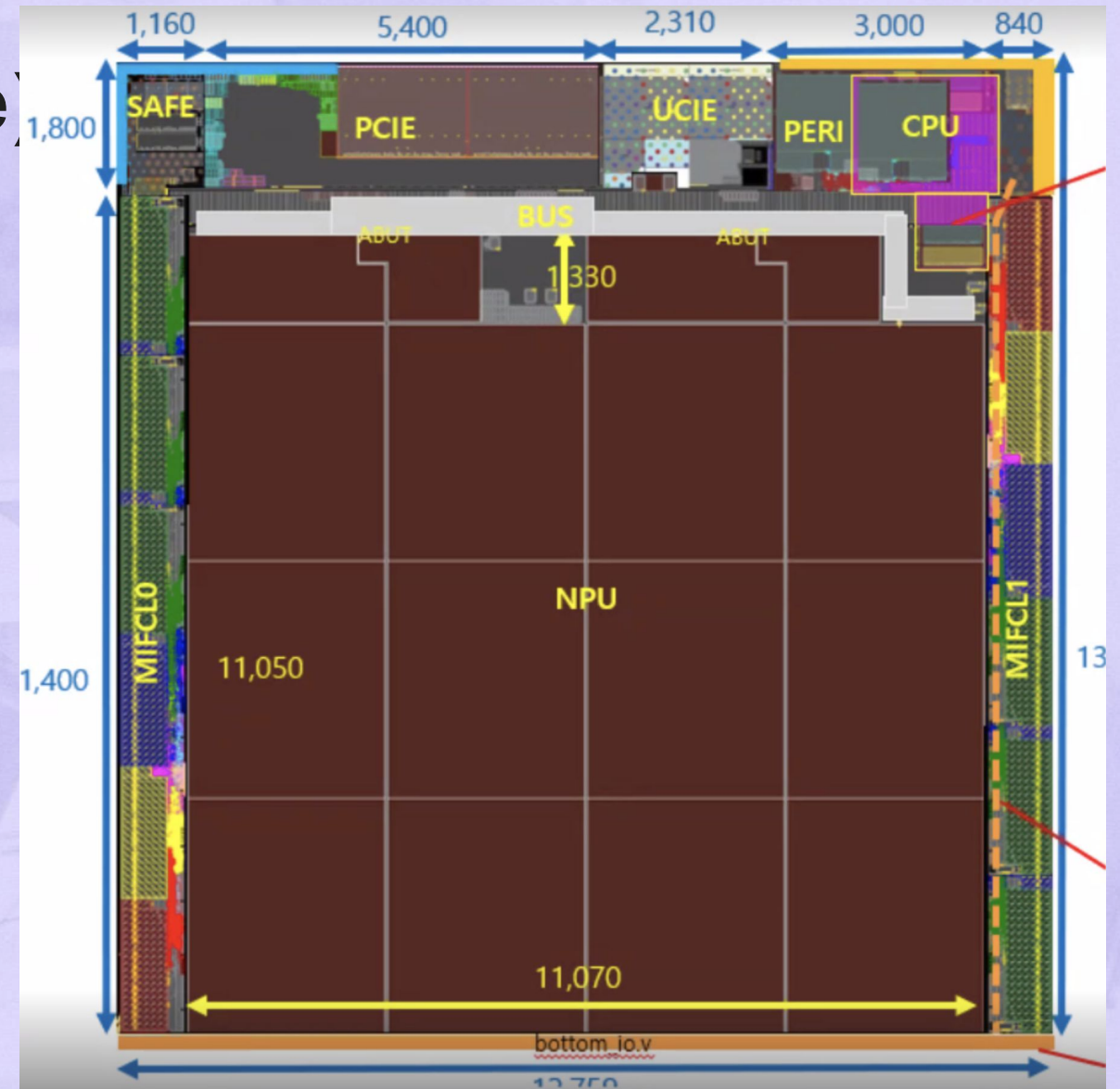
- Compatible across configurations
- Allows re-use of software modules



256 TOPS | 120 GB/s DRAM Bandwidth | 256GB/s NoC Bandwidth
ASIL-B(D)/SIL-2(3) NPU with Efficient Safety Implementation

N1 Project status (needs update)

- RTL:
 - All N1 Ips except Tensix + UCIE are RTL Frozen
 - UCIE IP from Synopsys due in May 25'
 - Tensix is the last piece missing after that ...
- Physical design
 - Tensix is in the center of their die. If Tensix Changes in size they need to change the surrounding IP floor plan thus opening to timing violations
 - Tensix is still anticipated to increase/decrease with area over time as RTL is not complete.
 - BOS is forced to redo their PD flow with every drop
- Tape out schedule :
 - Based on end of April final drop : August – September
 - They had to push out their tapeout date due to Are not being fixed across drops
- BMW is engaged with BOS and is dependent on timely product delivery



Date	Recent Project History	Owner	Target Final Drop	BOS Tape Out Date
Sep '24	NEO Freeze (2/28) and QSR TO (8/31) schedules reset Link	Eric	Dec '24	May '25 (??)
Oct '24	BOS POR Closed Link	Yuval/Eric	Pending	May '25 (??)
Nov '24	BOS Schedule reset communicated Link	Aniket	Apr '25	May '25
Dec '24	Drop - Release version - v0.3 (First well defined) Link	Yuval	Apr '25	May '25
Jan '24	BOS Risk flagged in HW Review Mtg 01/09	Eric	Risk flagged Drop difficulty, QSR DV, Resources	May '25
Jan '24	Resource and schedule risks flagged to Gold Team - unresolved	Eric	Risk flagged	May '25
Feb '24	Drop - Release version - v0.4 Link	Yuval	Risk flagged	Aug '25
Apr '24	Drop - Release version - v0.4.1 Link	Yuval	Risk flagged	Aug '25
Apr '24	NEO Freeze slipping to EO April with risk (DV, Bug Rates, STA and Perf Ver. not converged) Link to proposed reset	Eric	+ 2 months QSR slip + 2 month effort left	Aug '25
Apr '24	Drop - Release version - v0.4.2 (proposed) Customer Final Integration Drop			

Feature Implementation Status

Priority	Feature	Owner	Remaining Effort	Due Date	Status	Next Steps and comments
P0	INT4 using INT8 logic	Syed	Done		Done	
P0	Reduce FP16 MAC speed	Syed	Done		Done	
P0	Freedom from interference (FFI)	Kevin	2 wks			
P0	Group IP (FFI related) - Trinity specific	Kevin	See above			
P0	Security (FFI related) - Trinity specific	Kevin	See above			
P0	Tensix 3MB L1	Syed	Done		Done	
P0	Trinity specific NOC2AXI RTL changes	Kevin	Done		Done	
P0	Quasar Delta. Twp dispatch cores and two router-only cores	Kevin	Done		Done	
P0	Support for 12 NEO clusters instead of 16	Kevin	Done		Done	
P0	Dispatch core memory reduced to 3MB from 4MB	Syed	Done		Done	
P1	Power optimizations	RTL/PD	Done		Done	
WIP	Core Harvesting					

FuSa Technical Enabling

Priority	Feature	Owner	Remaining Effort	Due Date	Status	Next Steps and comments
P0	EDC Controller		3 wks - RTL 4 wks - DV		Not Started	
P0	L1 ECC		Done		Done	
P0	TDMA Self-Test		Done		Done	
P0	FPU Self Test		3 wks - RTL 3 wks - DV		Not Started	
P0	SFPU Self Test		3 wks - RTL 3 wks - DV		Not Started	
P0	SRC/DST Parity		3 wks - DV		Not Started	
P0	Rocket Core Safety		Done*		Done*	We need to fully verify support.
P0	Baby RISC Safety		3 wks - RTL 2 wks - DV		Not Started	
P0	NoC Safety		Done		Done	

Feature Verification Status

Priority	Feature	Owner	Remaining Effort	Due Date	Status	Next Steps and comments
P0	Standard Highly Randomized DV	Armond	2 wks		Not Started	
P0	Data movement tests	Kevin	Done*		Port	Need to port to Trinity
P0	AXI interface random tests	Kevin	Done*		Port	Need to port to Trinity
P0	Tensix OPs - FPU	Armond	2 wks		Not Started	Additional changes required
P0	Tensix OPs - SFPU	Armond	Done*		Port	Port from QSR
P0	Tensix OPs - SRFU+FPU together (srca+srcs)	Armond	3 wks		Not Started	Additional changes required
P0	Tensix OPs - Multi-type conversion	Armond	2 wks		Not Started	Additional changes required
P0	User bit tests	Kevin	Done		Done	
P0	ATT tests	Kevin	Done		Done	
P0	Broadcast	Kevin	Done		Done	
P0	Post Silicon Test Suite	Armond/Kevin	2 wks		Not Started	Must include tests from Aether and SoC
P0	Power (Analysis) Tests run on Trinity config (QSR tests)	Armond/Kevin	3 wks*		Not Started	

Feature Verification Status

Priority	Feature	Owner	Remaining Effort	Due Date	Status	Next Steps and comments
P0	Trinity Specific feature testing	Armond/ Kevin	12 wks		Not Started	
P0	HW Verification plan	Armond/ Kevin	12 wks		Not Started	
P0	Dispatch Core test plan implementation	Kevin	4 wks		Not Started	
P0	System level integration DV tests	Kevin	2 wks		Not Started	
P0	aTT programming	Kevin	Done		Done	

Status	QSR Dependencies	Accelerant	Earliest Date	Risk To Date	Owner
Feature complete (-Fusa) Note - Monthly RTL updates to BOS planned until GR.	05/15 - Tensix/NOC Feature Complete (Risk Call) 06/15 - Final PnR & Synth on schedule	RISC-V loaners assumed through completion (QSR and BOS)	05/30/2025	7/30/2025	Stan
Power optimization	6/30 - Low ECO rate/risk in FFN/TT-ECO window (PD)		06/30/2025	8/30/2025	Stan / Dan
Area closure	6/30 - Low ECO rate/risk in FFN/TT-ECO window (PD)		06/30/2025	8/30/2025	
FusA Feature complete	05/15 - Tensix/NOC Feature Complete	RISC-V loaners assumed through completion (QSR and BOS) 5 additional RTL heads in May	06/30/2025	8/30/2025	
Timing closure	07/15 - on track to enter Post ECO and PD cleanup phase		07/31/2025	9/30/2025	Stan / Dan
DV complete	06/15 - DV ramp gated by: - Trivial bug rate - E2E perf complete - Formal verification in place - FCOV/CCOV > 95%	RISC-V loaners assumed through completion (QSR and BOS) 5 additional DV heads in May	08/29/2025	10/31/2025	Stan
General Release gr1.0.0			08/29/2025	10/31/2025	Stan
FuSa documentation			01/30/2026	03/30/2026	Eric Zhang / Eric Fernandez

Risks and Critical Paths

Risks	Owner	Likelihood	Impact	Trend	Mitigation Option + Next Step

Other considerations

- BOS claims they are ok with pushing tape out further if we use their N1 die as our Automotive ML die
 - N1 Doesn't match our ML die specification , may need to open up the Spec
- Tenstorrent gave 2m\$ prepayment for future design services
- Base Die collaboration might soften the message

BOS - A0 (N1 Board) - Status & Next Steps

Next Milestones

Upcoming demo to BMW - they want to demo YoLo v8 on N1 - postponed to May 22nd

BOS shared that they are able to run the demo on A0 - now focused on performance

Feature requests

No feature requests at this time

Main effort is around board bring up & Demo

Item	JIRA	Priority	Status
B0 - Fast dispatcher DMA to Host	https://tenstorrent.atlassian.net/browse/BOS-832	High	Under investigation - should be 'low hanging fruit' to gain additional perf
NOC - DRAM hang	https://tenstorrent.atlassian.net/browse/BOS-850	Critical - Non-Blocking - A workaround in place - Investigating	Resolved using SW reset - a documentation request was submitted
NOC - Multicast channel 0 unresponsive	https://tenstorrent.atlassian.net/browse/BOS-852	Critical - Non-Blocking - A workaround in place - Investigating	Under investigation - bypass in place - none-blocking the demo

BOS - B0 project - Status & Next Steps

Next Milestones

TT updated BOS with the latest Trinity schedule - Pending BOS feedback

Trinity's new schedule will be moved to E/O Oct - aiming to enable BOS T0 by Feb 2026

Feature requests

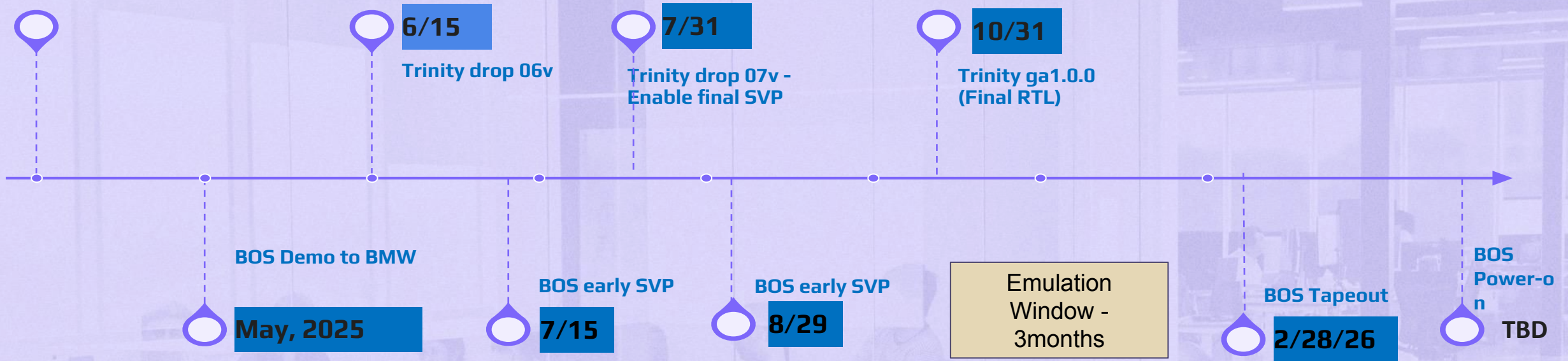
They requested an RTL change for clock ports & Harvesting - TT accepted

Item	JIRA	Priority	Status
Project timeline slip - Trinity	-	Critical	TT has shared the updated Trinity schedule - pending BOS response
Harvesting	-	Critical	TT confirmed we can able functional Harvesting of the mesh, col by col. BOS accepted. Additional technical discussions needed
Clock ports RTL modification	https://tenstorrent.atlassian.net/jira/servicedesk/projects/BOS/issues/BOS-823	High	TT confirmed we can enable this request - it's a minor RTL change

Trinity Status

Milestone	Date	Notes	Status
RTL Complete Limited Release, Ir0.1.0, Integration 1 (LAC)	End of Dec 2024	Includes: •Dispatch Cores •Dispatch core memory reduced to 3MB from 4MB •Updated NOC2AXI •PD Support (Floorplans & Timing + implementation manual) •Area accurate •SRAM Fixed •> 95% Ports Fixed • Note: RTL complete but NOT DV complete. There will be bugs	delivered
Additional Features (Oct request - POR Closed)	End of Feb 2025	Includes: •Support for INT4 read, converts to INT8 in Tensix •BF16 MACs count = 2048 •MBIST	Delivered
BOS Final Drop General Release, gr1.0.0, Design Closure (EAC)	End of April 2025	Includes: •DV complete •FuSa technical enabling •Updated implementation guideline •Full test vector test suite •Power optimization	Delayed
Tapeout (BOS)	August/September 2025		
FuSa Certification	End of Jan 2026	ISO standard 26262 FuSa certified by 3rd party	

Trinity / BOS timeline



- [Detailed HW Drop Schedule](#)