IEEE Hot Interconnects 32
2025

Artem Y. Polyakov
General Chair

HOTI 2025

IEEE Symposium on High-Performance Interconnects
20-22 August 2025 • Virtual, United States

“HotI-est” topics through years

Year - 20XX

02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Topologies, routing switching & packet processing																							
S4		KS2	S3	S2		S2					P			S3									T
On-chip and chip-to-chip communications																							
							KS		S		S						S	S	K	T	K		T+
Network acceleration, offloads & SmartNICs																							
				P						S		P						P	P	S			
Optical interconnects, silicon photonics																							
S				S	K	P	S2	PS		K		T2	ItS		ST				K	PT	K+	P	ST+
Collective communication																							
									S													S2T	T
Infrastructure: virtualization, cloud, large-scale																							
S	S	KP	PS	T2			S		P	P	KT	K	PT	K2It			PIt	KS			K	K	K2
Artificial Intelligence																							
													K				T2	S	S		K2S	KP+	KP+

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High-performance interconnects

20XX

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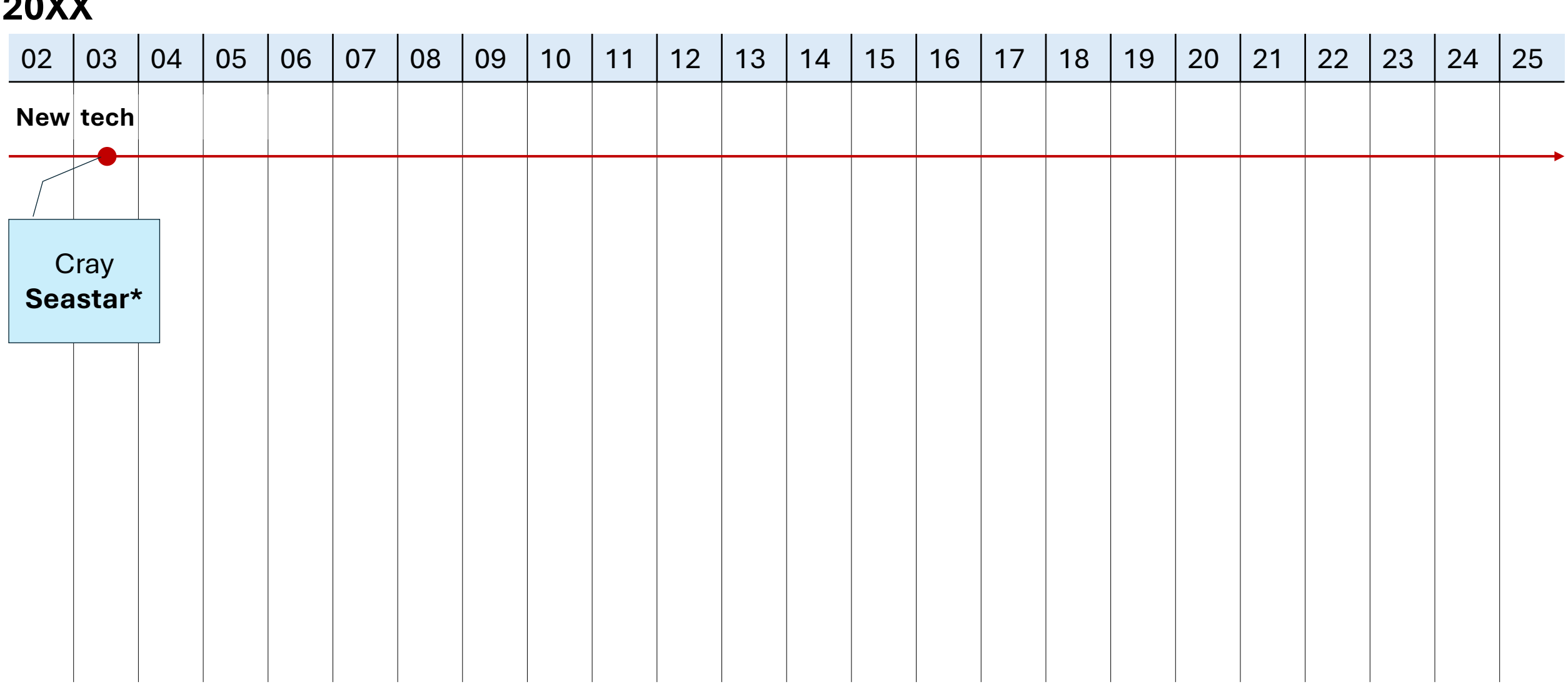
High-performance interconnects



* HotI'12 Cray slides https://old.hoti.org/hoti20/slides/Bob_Alverson.pdf

High-performance interconnects

20XX

02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

Cray **Seastar***

PathScale **InfiniPath** (poster)

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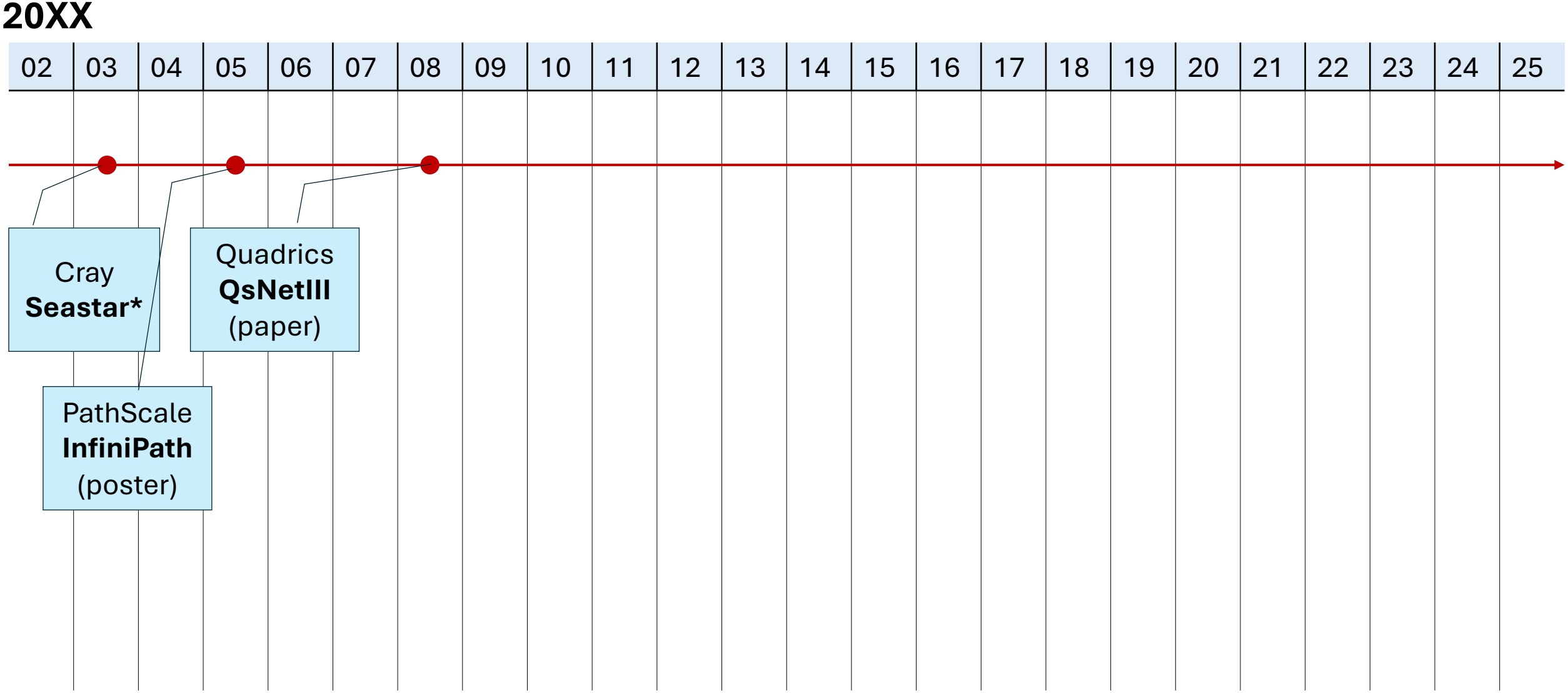
High-performance interconnects



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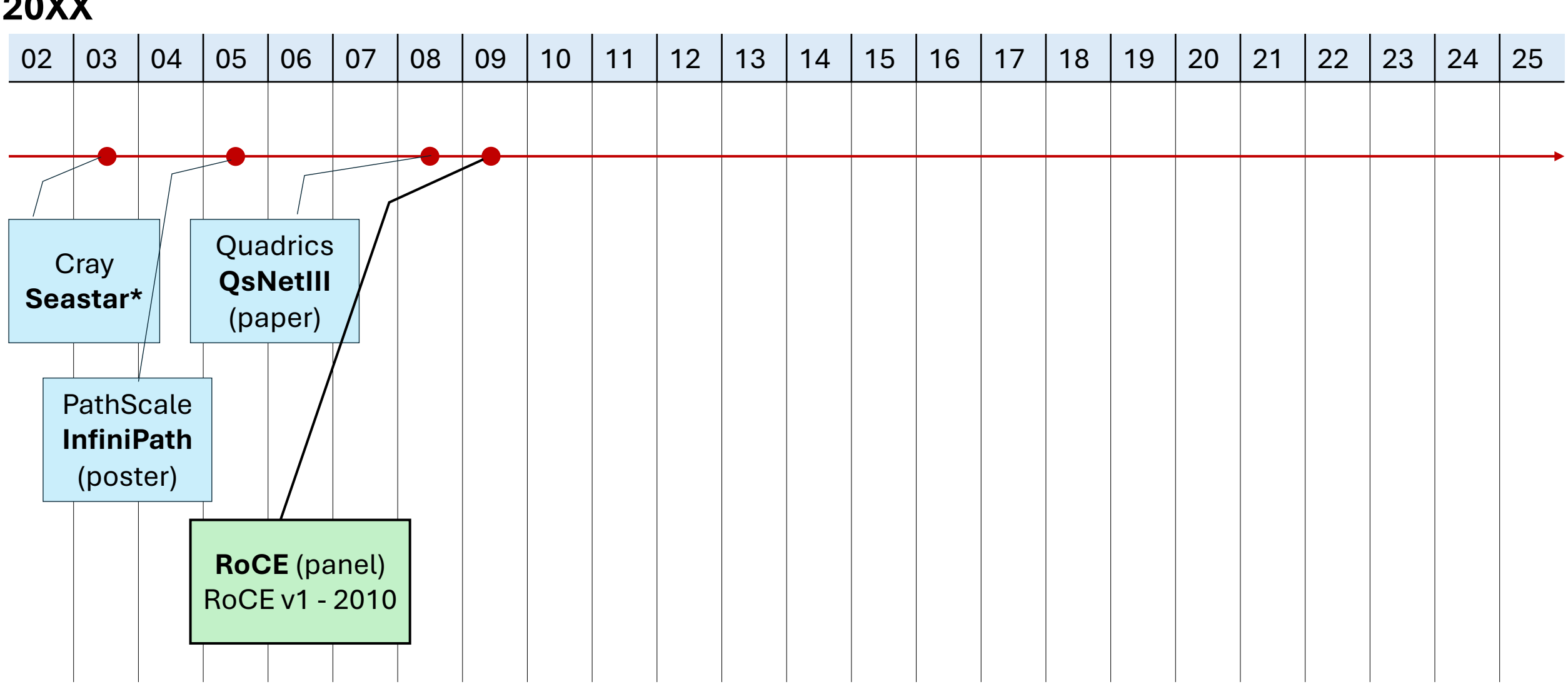

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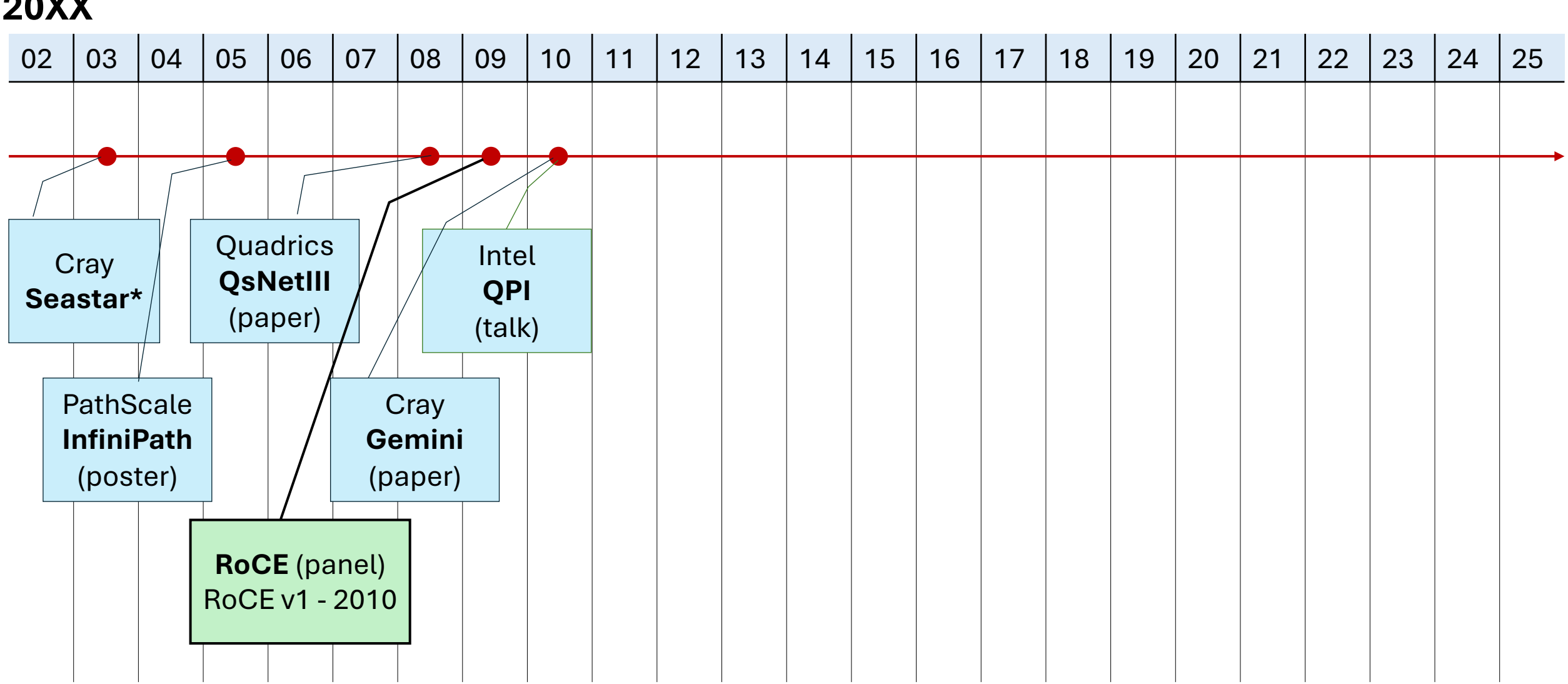

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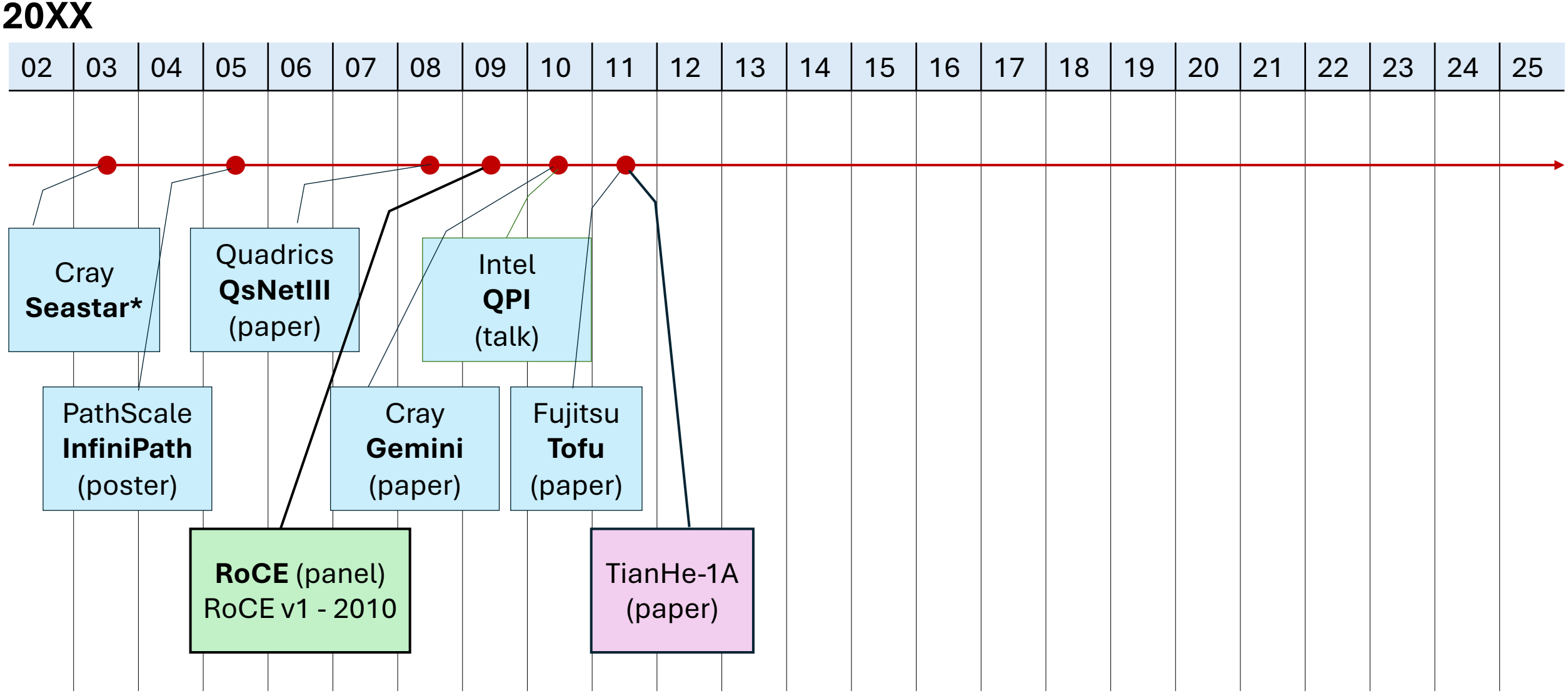

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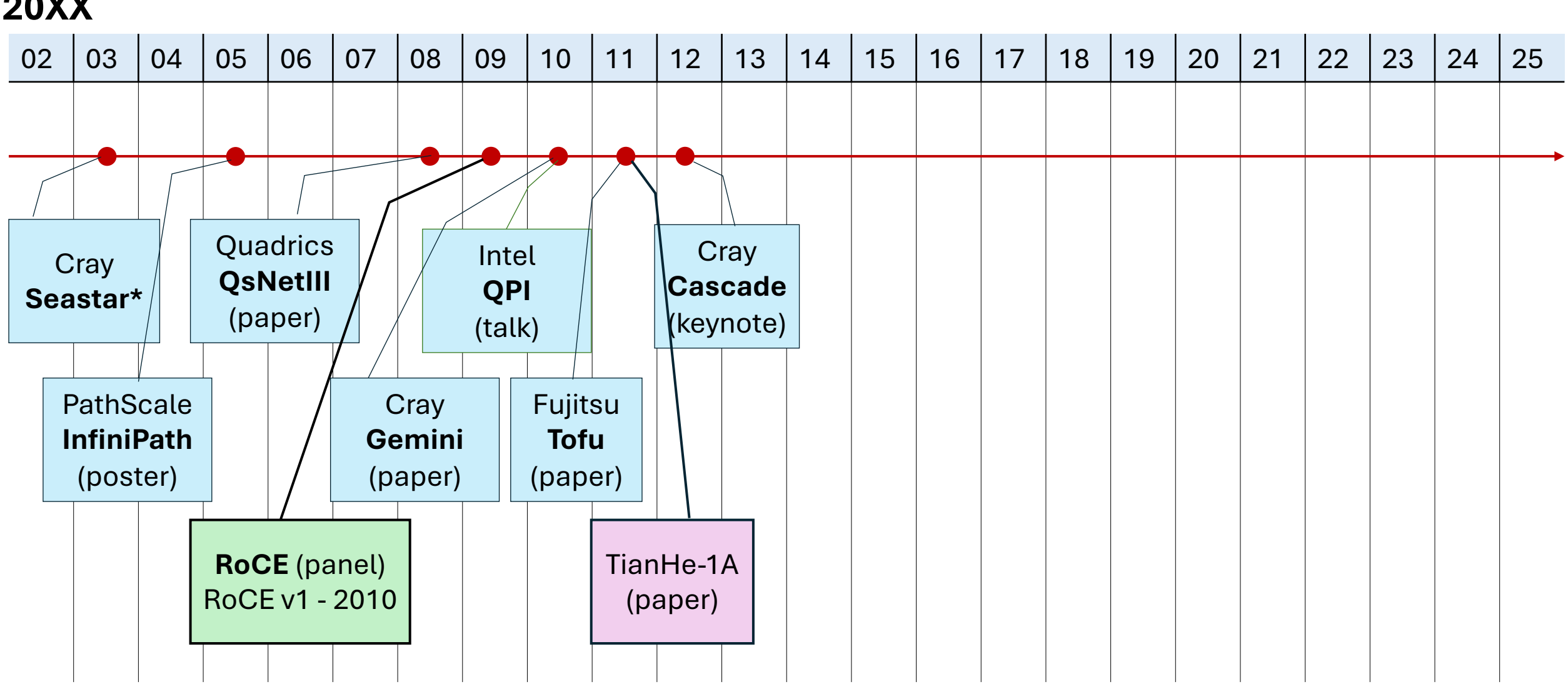

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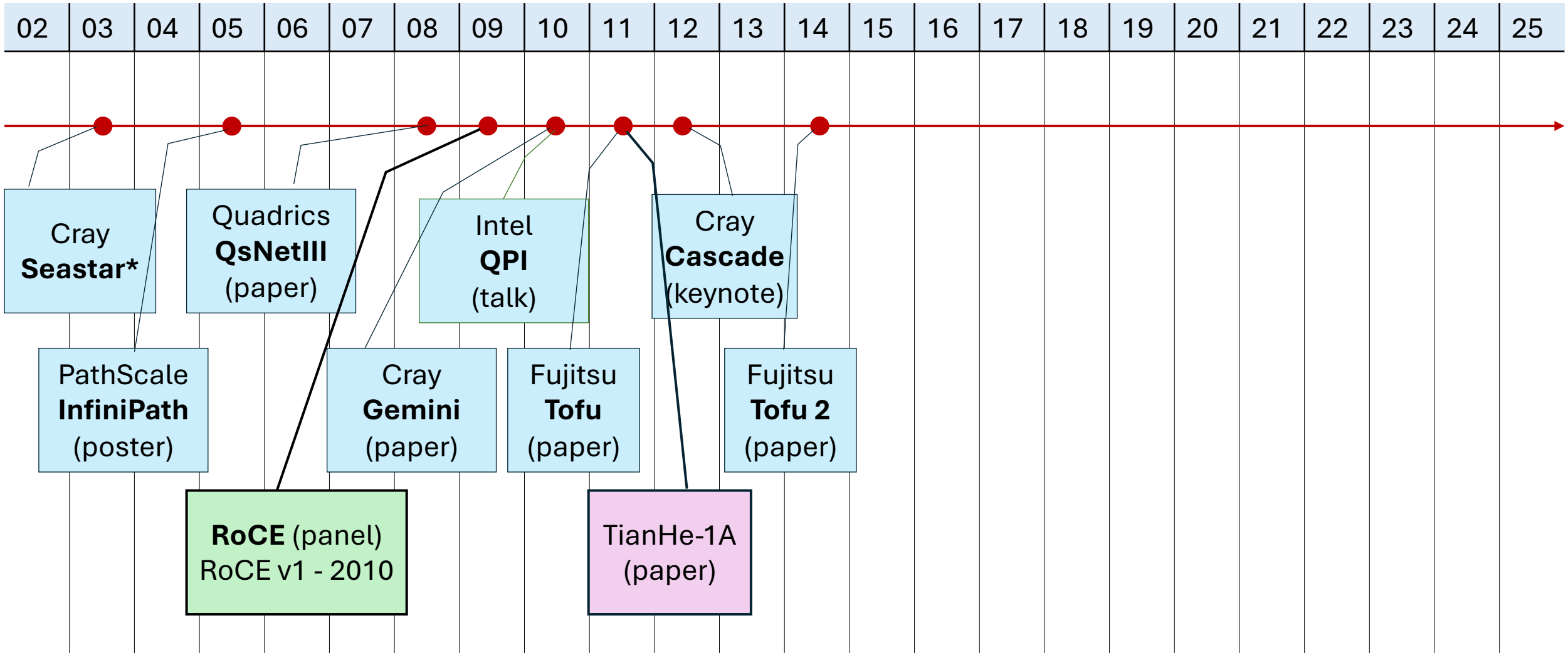

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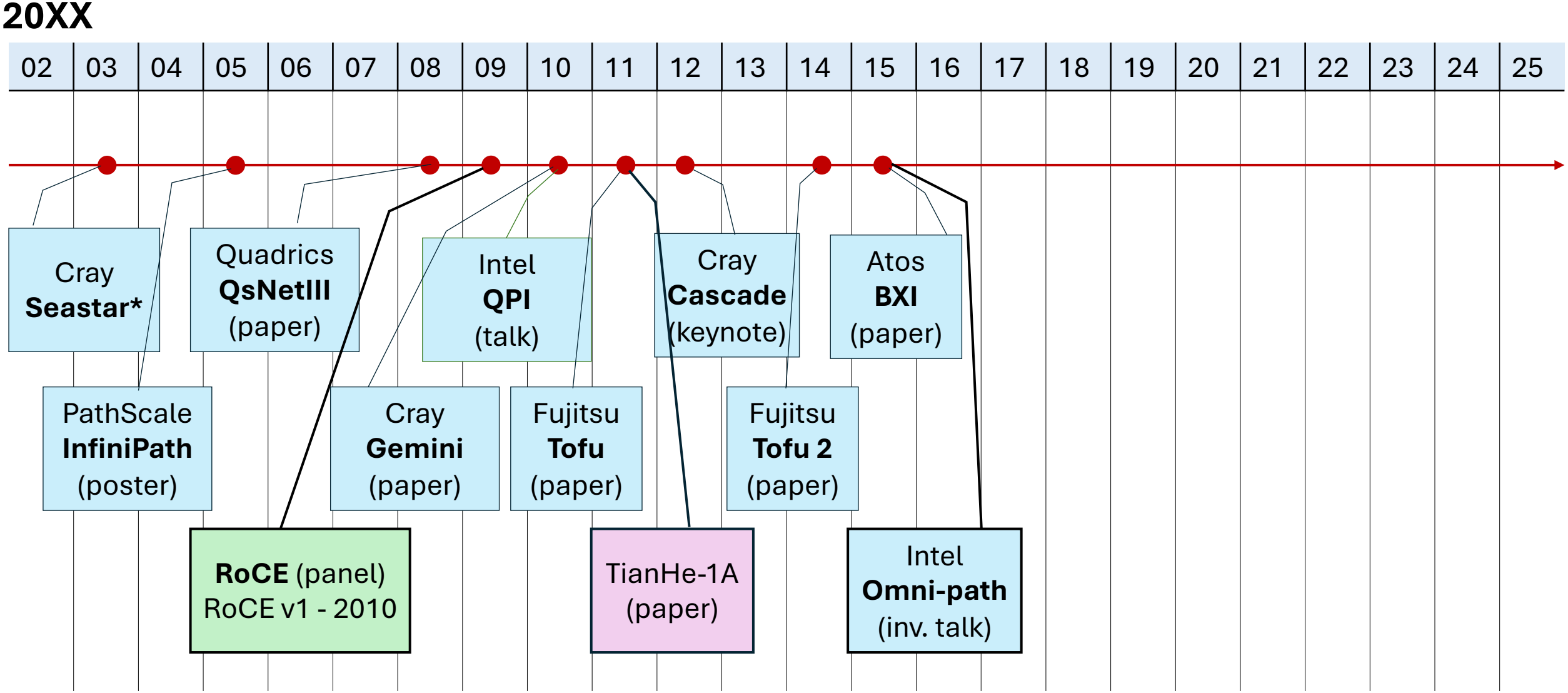

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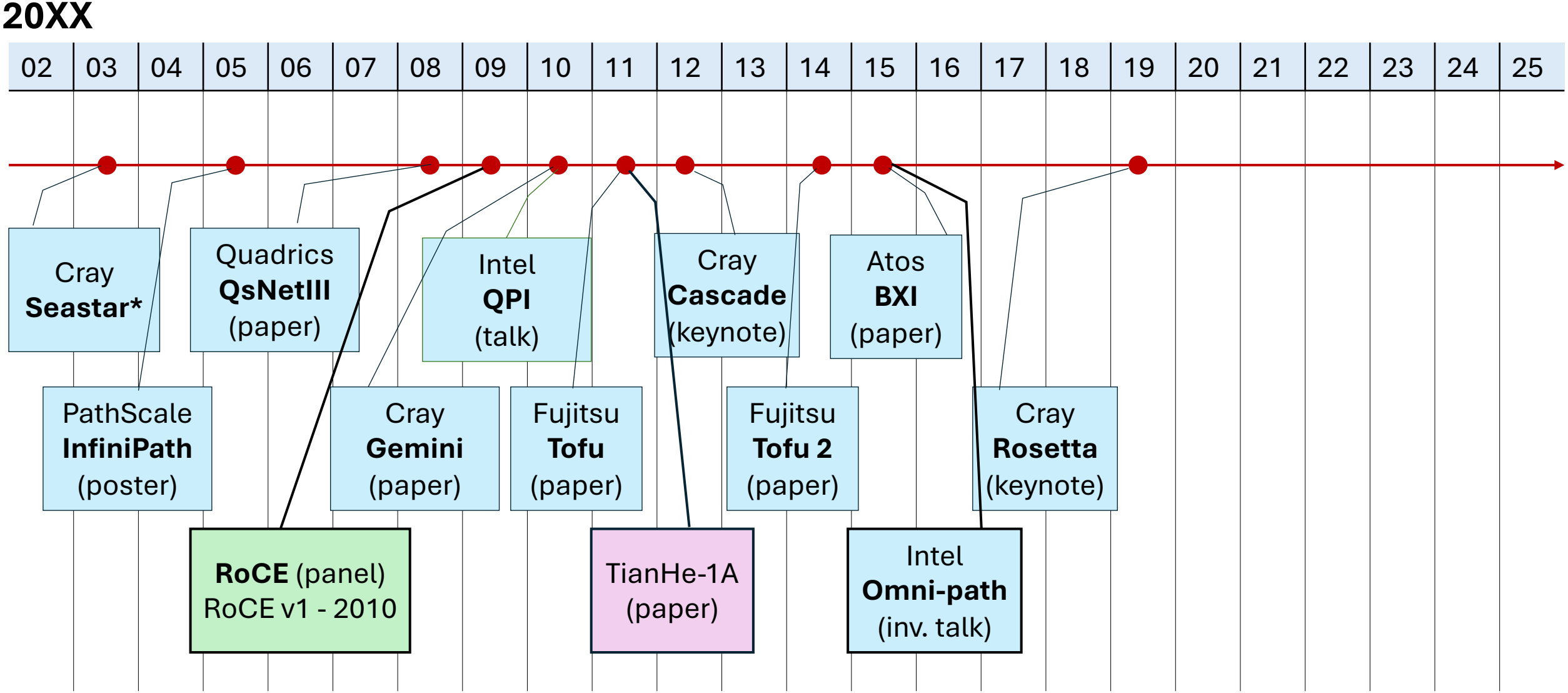

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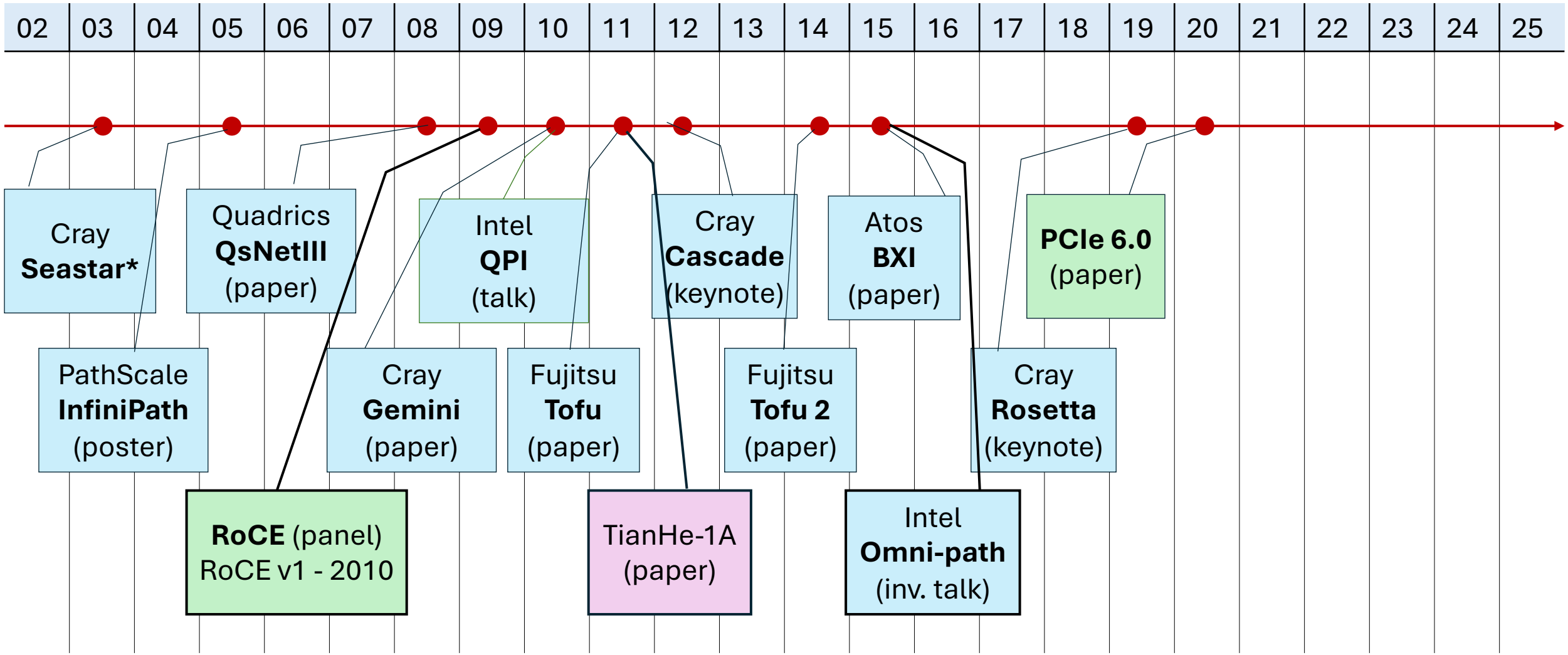

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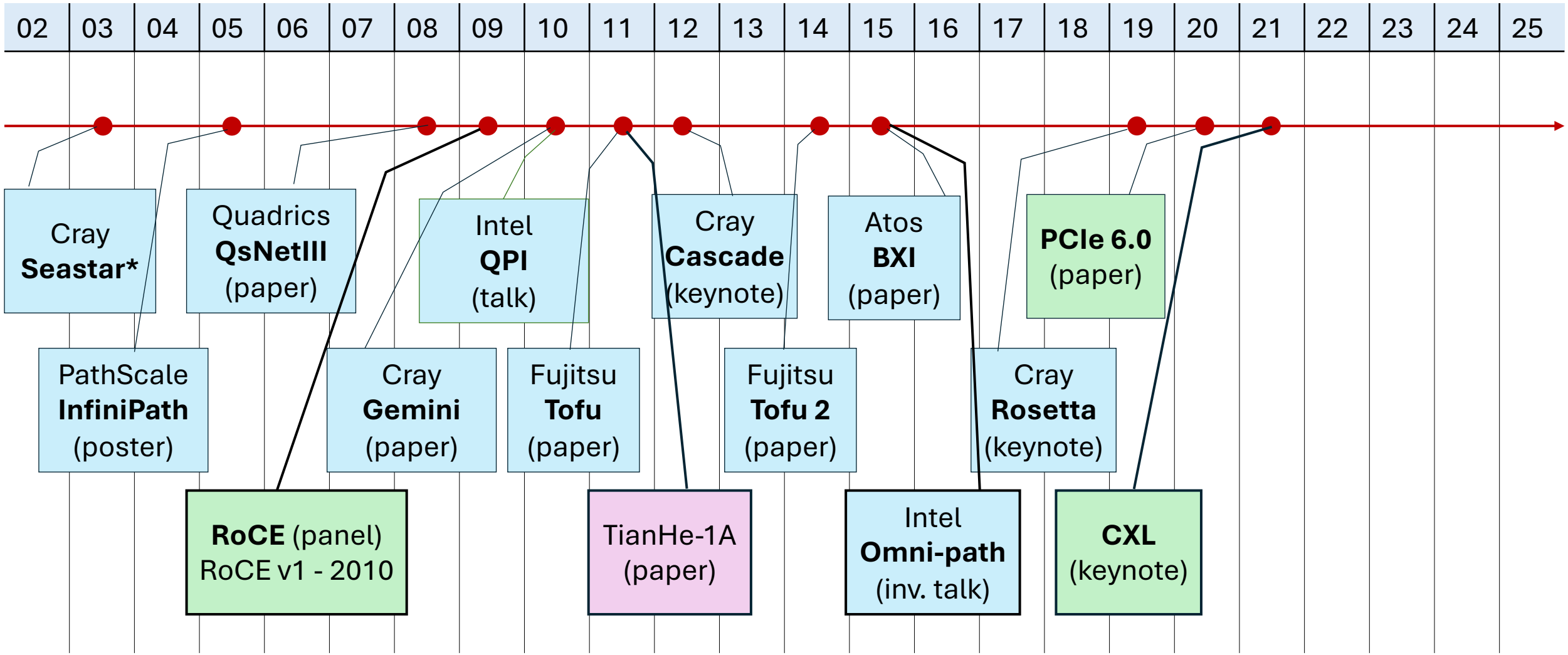

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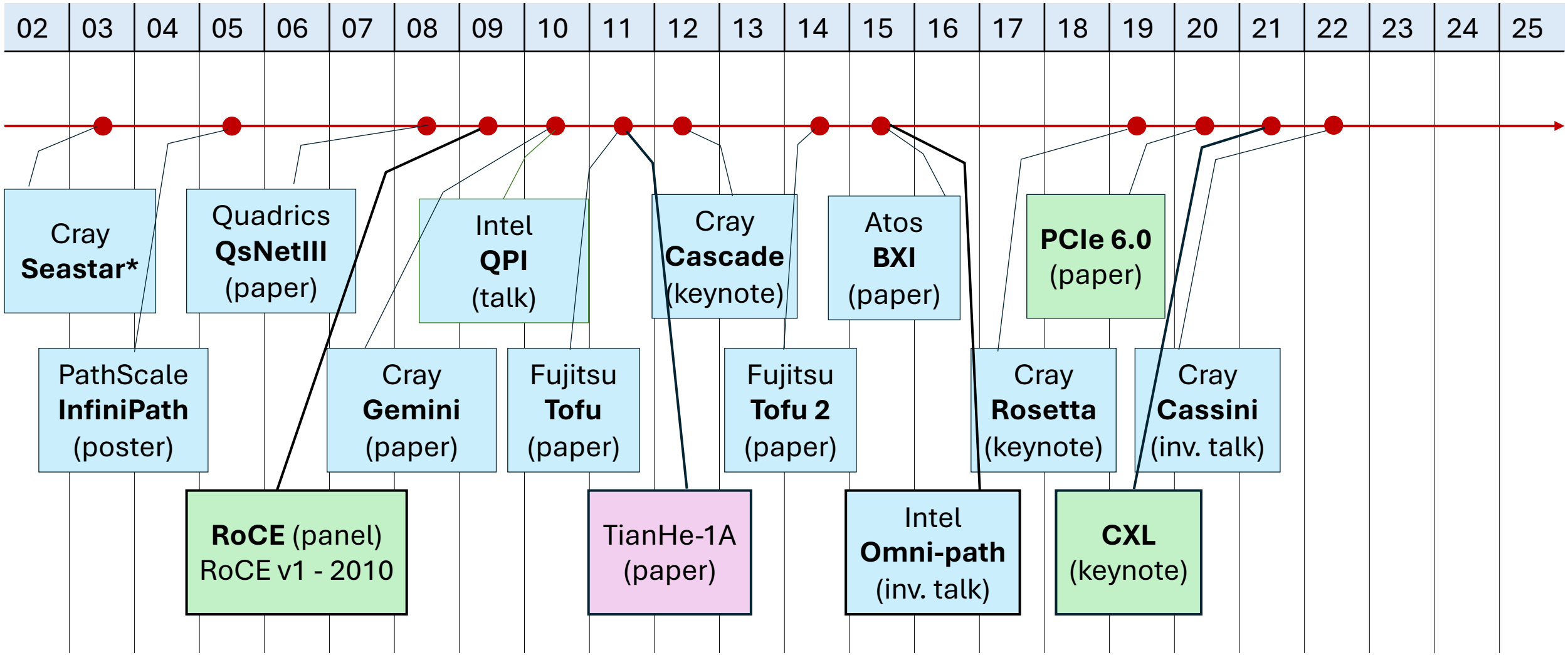

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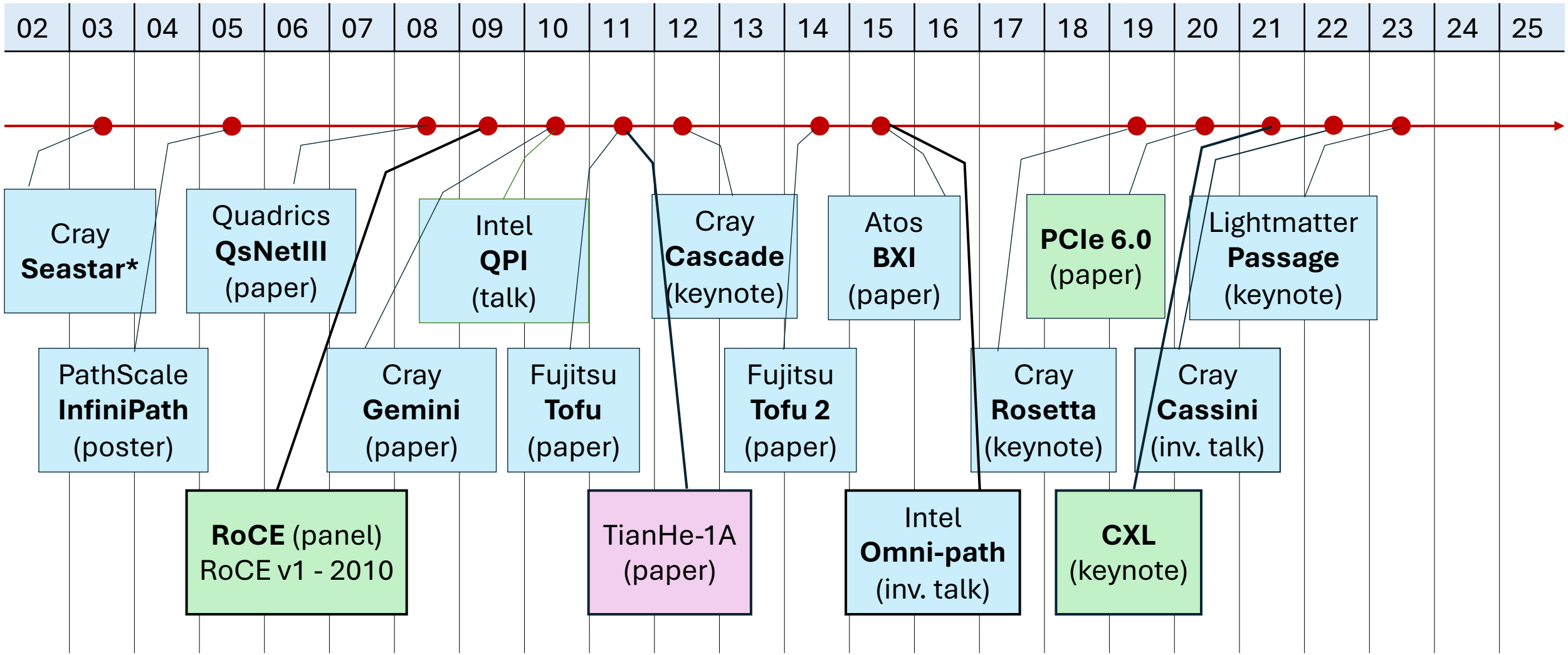

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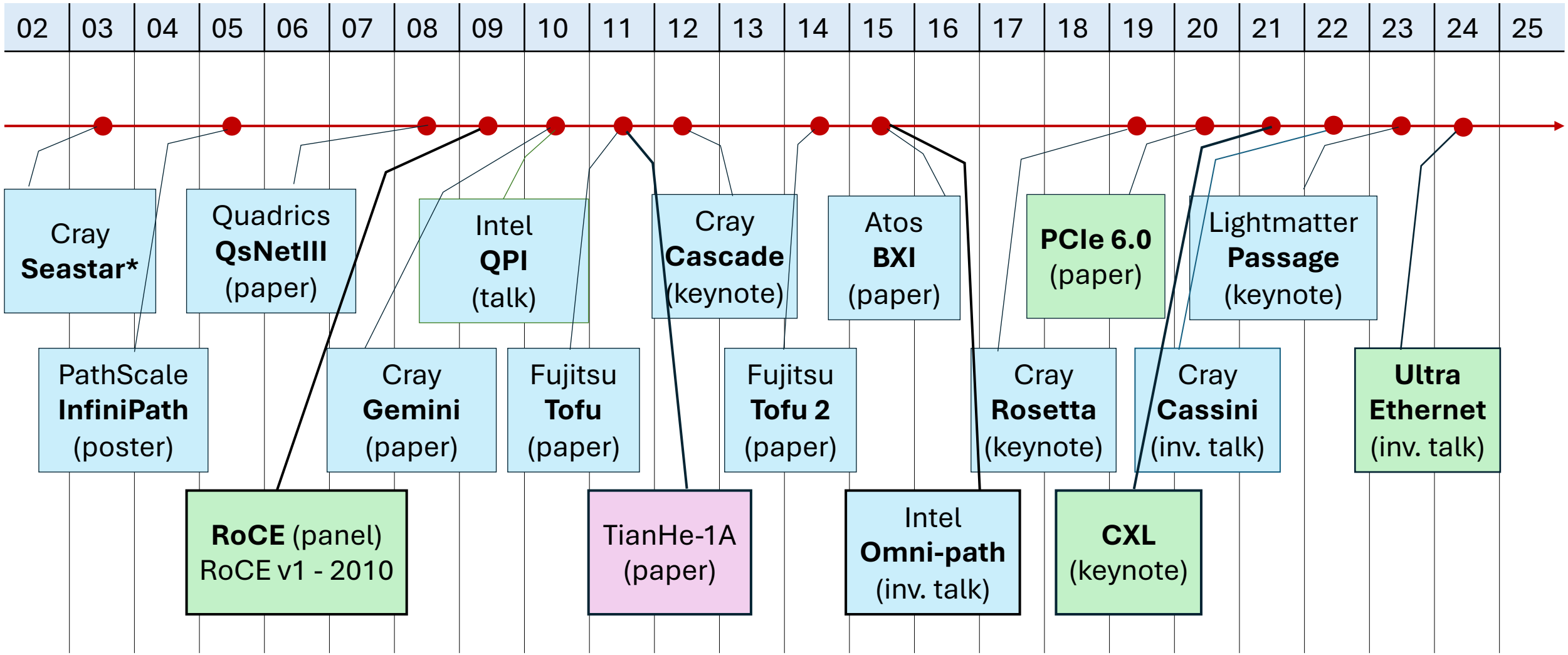

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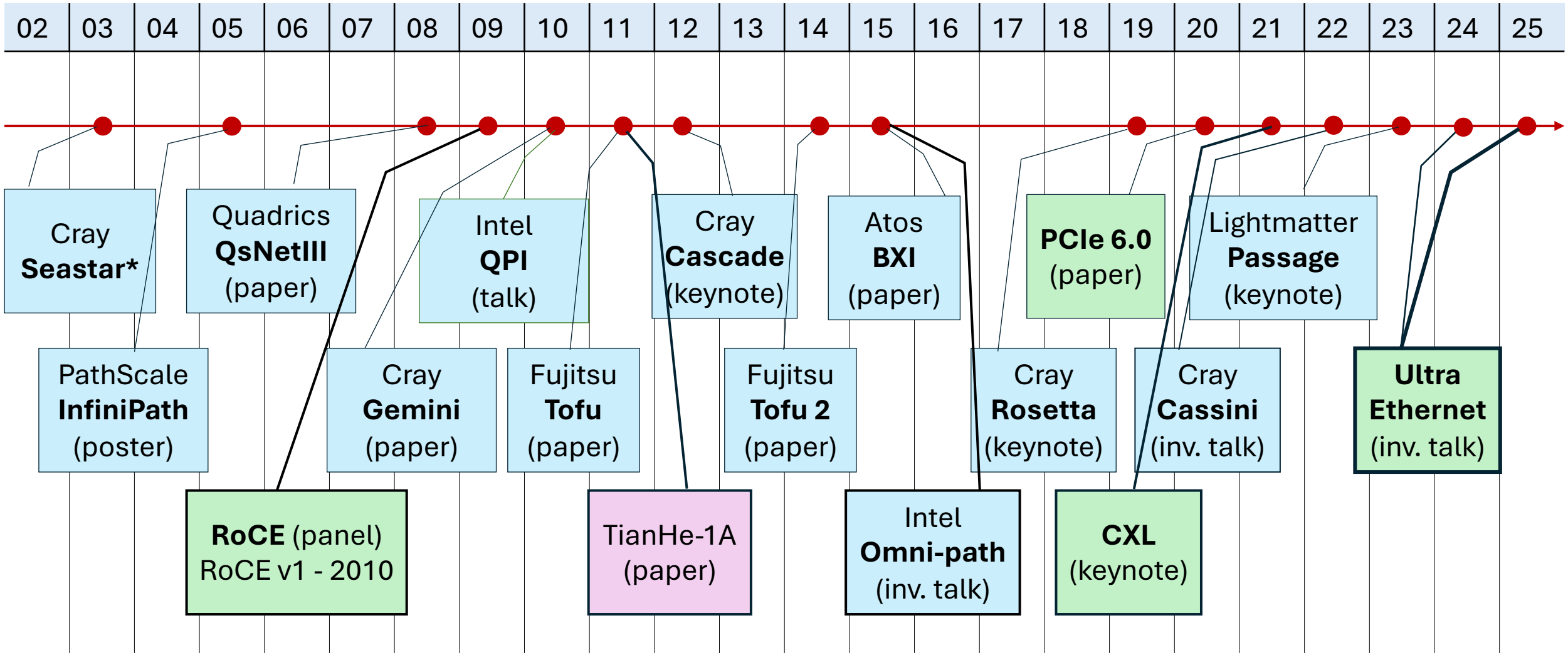

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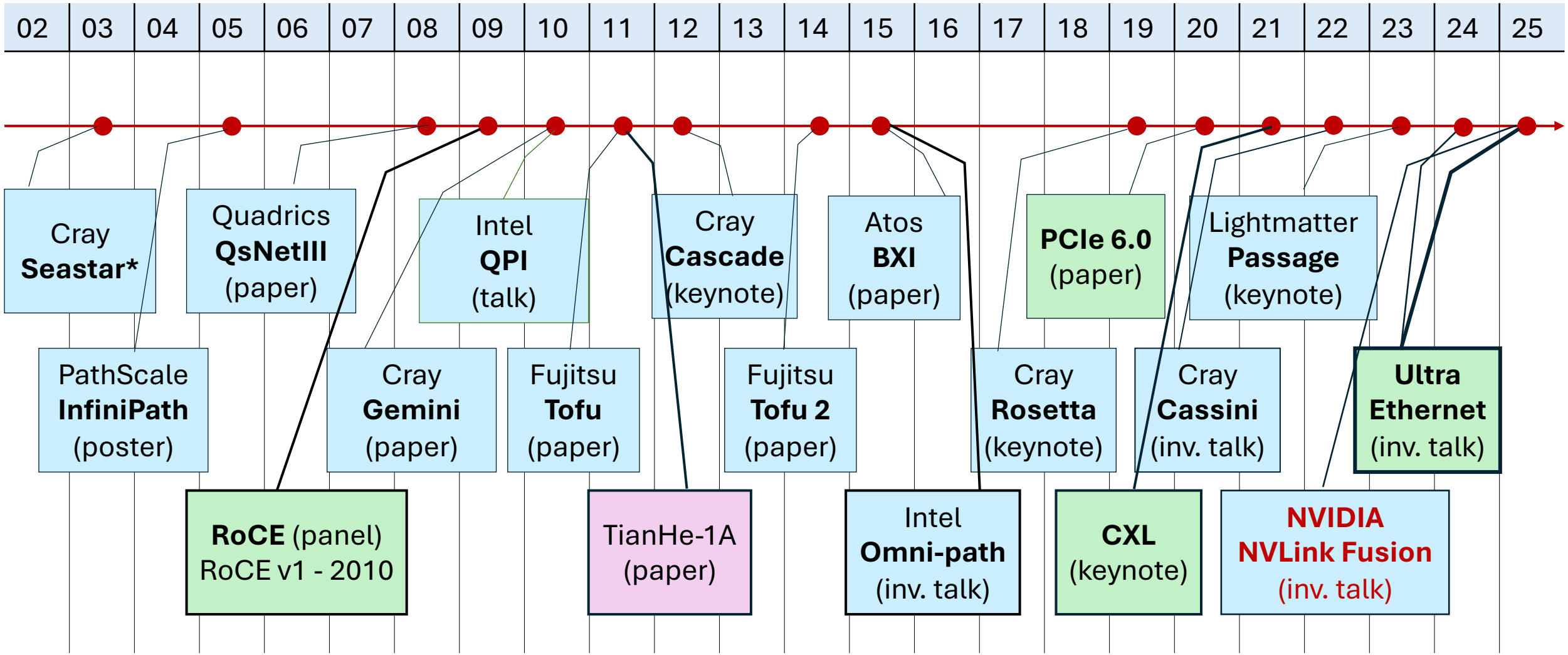

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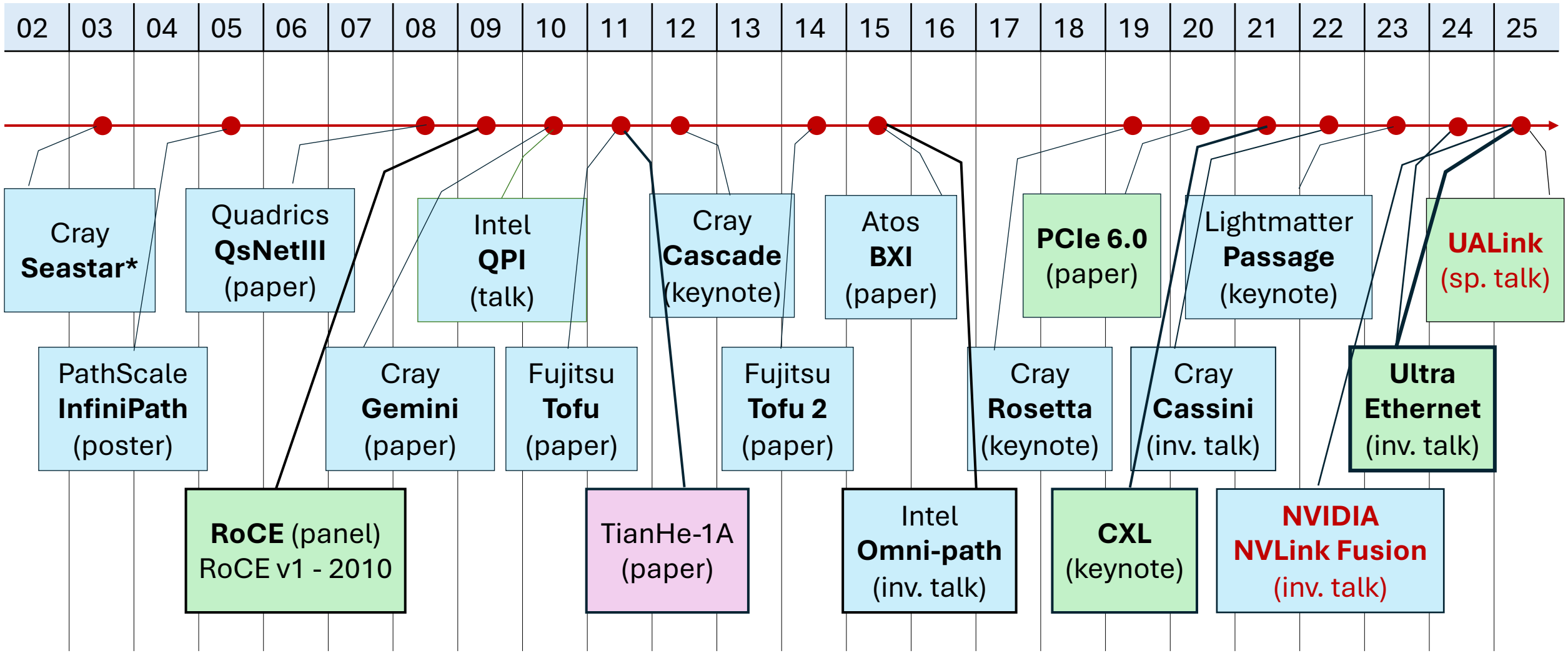

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HotI'25 topic – "Software"

- [2010] Stuck with Sockets: Why is the network programming interface still from the 1980s? (**panel**)
- [2011] Partitioned Global Address Space (PGAS) (session)
- [2015] Two most popular communication libraries announced
  - [**libfabric**] A Brief Introduction to the OpenFabrics Interfaces - A New Network API (paper)
  - **UCX**: An Open Source Framework for HPC Network APIs and Beyond (paper)
- [2019] MPI and HPC (session)
- [2024] Focus on collective communication
  - Collectives for Deep Learning / Optimizing Collective Operations (sessions)
  - Unified Collective Communication (**UCC**): An Unified Library for CPU, GPU, and DPU
- **[2025] Main topic: "Interconnect software: You can't touch it but you need it"**

HotI “What is the best?” panels

- [2002] Wi-Fi vs. GPRS vs. 3G
- [2005] EtherNET vs. EtherNOT
- [2011] Large Data Center Fabrics: Is There a Good Answer?
- [2017] Ethernet vs. HPC: Can the hyperscale ethernet data center handle all workloads?
- [2020] SmartNIC or DPU, Who Wins?
- [2023] EtherNET vs EtherNOT … again?

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- **[2025] LLM Token Economy: How is networking going to play in the age of agents?**

HotI'25 Program

- **Keynotes**
  - "*Now in Focus: the Fifth, GenAI Epoch of Computing Infrastructure*", **Amin Vahdat** (Google)
  - "*Evolving inter-connect fabric and SDN in the cloud to meet the needs of AI*", **Deepak Bansal** (Microsoft)
- **Panel** "LLM Token Economy: How is networking going to play in the age of agents?"
- **Invited talks**
  - "*Ultra Ethernet for next-generation AI and HPC workloads*", **Torsten Hoefler** (ETH)
  - "Building Custom AI Infrastructure with NVLink Fusion", Krishnan Geeyarpuram (NVIDIA)
- 9 **Technical talks**
  - Network Synchronization and Routing
  - Co-packaged Optics
  - Interconnect Software – Runtimes & Workloads
  - Scale-up Interconnects
- 10 Technical talks from HotI sponsors
- Tutorials
  - Principles and Practice of Scalable and Distributed Deep Neural Networks Training and Inference (OSU)
  - High-Performance and Smart Networking Technologies for HPC and AI (OSU)
  - Libfabric Communication Library (Intel)
  - GPU Communication Libraries for Accelerating HPC and AI Applications (NVIDIA)

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FREE Registration

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Best Paper
Cash Award - $1000

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HOT INTERCONNECTS

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IEEE COMPUTER SOCIETY

HPCwire

Lenovo

DELL Technologies

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Music by:

THE DAYOFFS

OUT OF CONTEST

Art Police

Mayfield Park

Best Paper
Cash Award - $1000

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Attendee Information

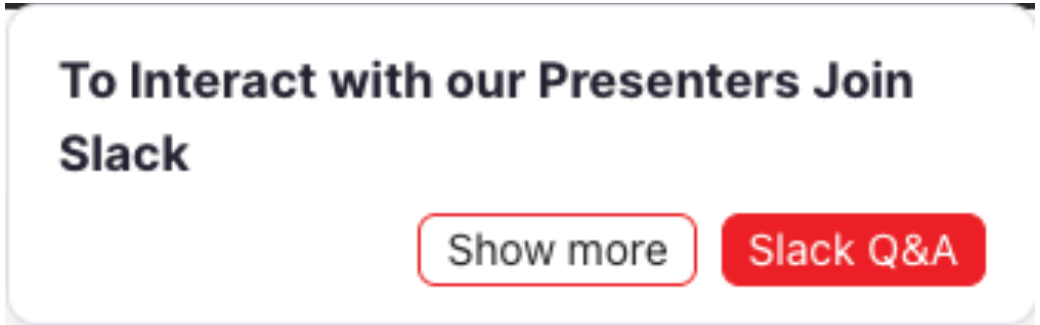
http://bit.ly/4lBoSLc

Early access to proceedings
https://hoti.org/program.html

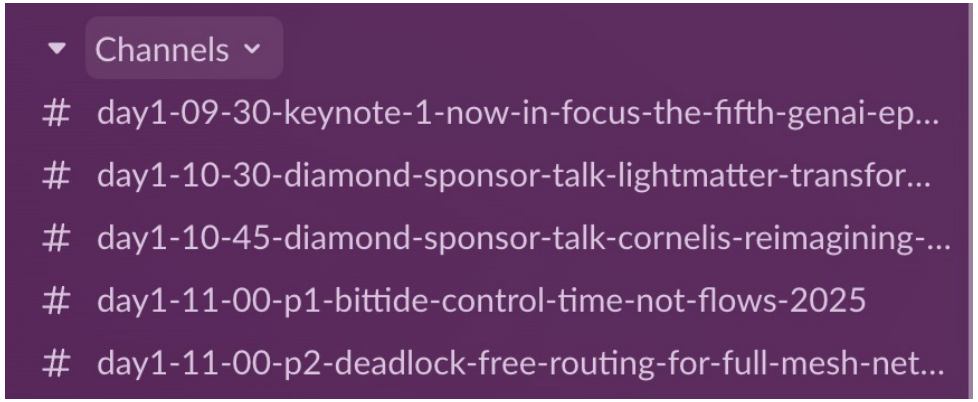
Questions and Answers

are conducted via SLACK!

Step1. Find the link to join in Zoom Lobby (top-right corner)



Step2. Individual channel for each talk



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- [2025] Evolving inter-connect fabric and SDN in the cloud to meet the needs of AI **Deepak Bansal, Microsoft** (keynote)

Keynote speaker

Amin Vahdat

Vice President of ML, Systems, and Cloud AI at Google

Now in Focus:
the Fifth, GenAI Epoch of Computing Infrastructure