



Pilot and Technician Outlook 2026 - 2045



NAVIGATING AVIATION'S NEXT WORKFORCE TRANSITION

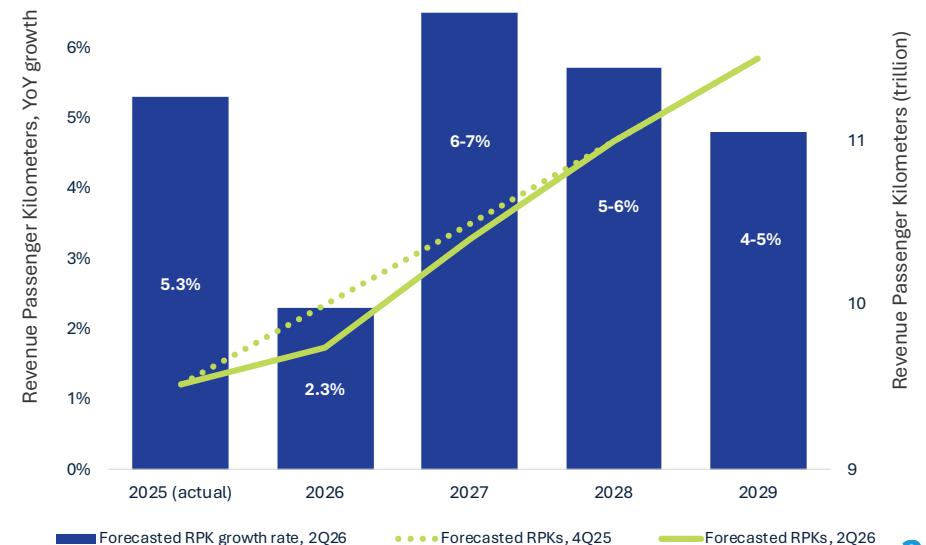
The commercial aviation workforce is entering a period of structural transition. After several years of elevated hiring to rebuild workforce levels depleted during the pandemic, overall personnel demand has begun to normalize. Still, demand remains high in several critical segments, particularly maintenance technicians, where fleet utilization, longer aircraft service lives, and complex maintenance requirements continue to support hiring.

An increased focus on pipeline development has allowed the industry to ease the pace of large-scale global recruitment campaigns for pilots and cabin crew. North America and Eurasia have remained exceptions, however, as retirement-driven replacement demand continues to support hiring and is expected to persist as large cohorts of experienced workers leave the workforce.

Maintenance technician hiring remains one of the most competitive segments of the aviation labor market. The industry continues to face a significant technician shortage, with global demand expected to nearly replace the entirety of the current workforce by 2045. Airlines have increased entry-level pay by approximately 50% since 2020 to attract and retain qualified personnel, but recruitment remains constrained by demanding working conditions, high barriers to entry, and competition from other technical industries. While younger workers are showing renewed interest

in skilled trades, aviation maintenance continues to compete for talent in a market where compensation, career development, and working conditions all influence workforce decisions.

In 2026, a combination of geopolitical and weather-related disruptions created an unexpected operational and economic shock for the industry, prompting some carriers to adjust recruitment plans for pilots and cabin crew. Technician demand has remained more resilient, however, due to persistent global shortages and the continued need to support aircraft maintenance schedules. While the impact is expected to be temporary within the 20-year forecast horizon, it is likely to create near-term pressure on recruitment and capacity planning over the next one to two years.



2,425,000

New aviation personnel needed over the next 20 years.



674,000

New pilots



728,000

New technicians

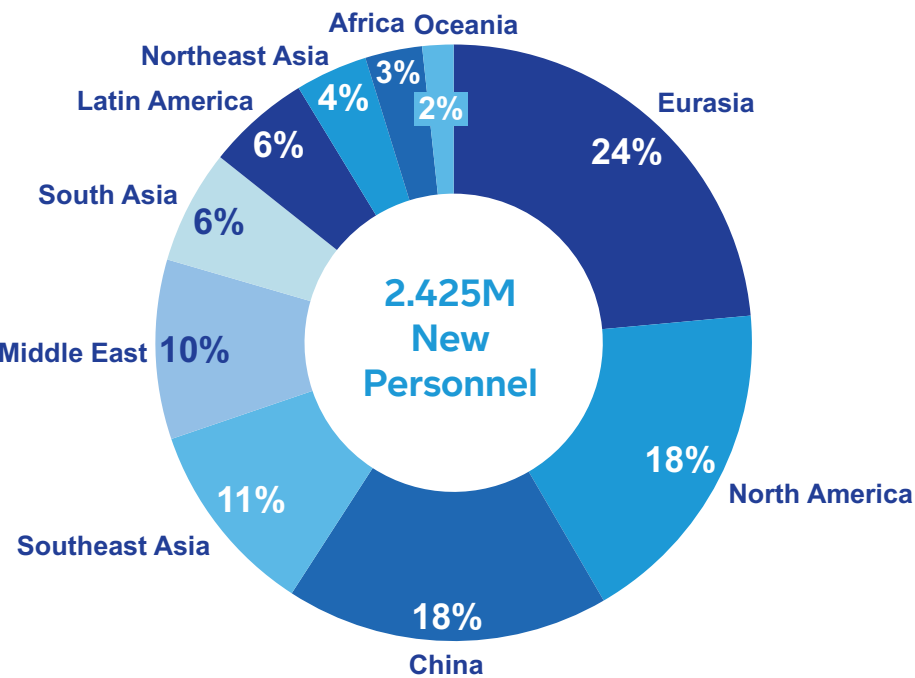


1,023,000

New cabin crew

PERSONNEL DEMAND AND SHIFTING DRIVERS

The 2026 Boeing Pilot and Technician Outlook (PTO) projects that the global commercial aviation industry will require **674,000** new pilots, **728,000** technicians, and **1,023,000** new cabin crew members over the next 20 years. Approximately 60% of this demand will come from Eurasia, China, and North America.



The primary drivers of personnel demand remain unchanged: fleet growth, workforce retirement, and ongoing turnover. The retirement wave, which has been widely discussed in recent years, will continue over the next decade as large cohorts of Baby Boomers and early Generation X workers reach retirement age. In the second decade of the forecast period, fleet growth will become the primary demand driver as delivery activity expands to support airline growth.

Replacement demand is especially pronounced among pilots in North America and Europe, where a significant share of the workforce will retire over the next decade. Cabin crew will also see steady replacement demand, although at a lower rate than pilots. This transition will erode experience, mentoring capacity, and operational continuity across the industry. In many cases, these cohorts have supported the sector through multiple cycles of growth, contraction, and recovery, and their departure will create a generational gap that affects staffing levels and knowledge transfer.

Maintenance technicians face a particularly competitive labor market driven by a limited supply of qualified candidates and the specialized nature of the work. Airlines and maintenance, repair and overhaul (MROs) providers continue to report difficulty filling roles that require line maintenance experience, airframe-specific expertise, and strong troubleshooting skills. The challenge is compounded by retirements, attrition, and competition from other technical industries. As aircraft utilization remains high and fleets become more complex, older aircraft require additional care while next-generation aircraft need advanced diagnostic skills and familiarity with digital maintenance systems.

These trends will continue to shape the labor market over the next 20 years. Retirement-driven replacement demand will remain elevated over the next decade, fleet growth will become the primary driver in the second decade, and technician turnover will continue to widen the gap between available labor and operational need. As a result, aviation organizations will need to focus not only on recruitment, but also on retention, training, and long-term capability building.





BUILDING THE TALENT PIPELINE

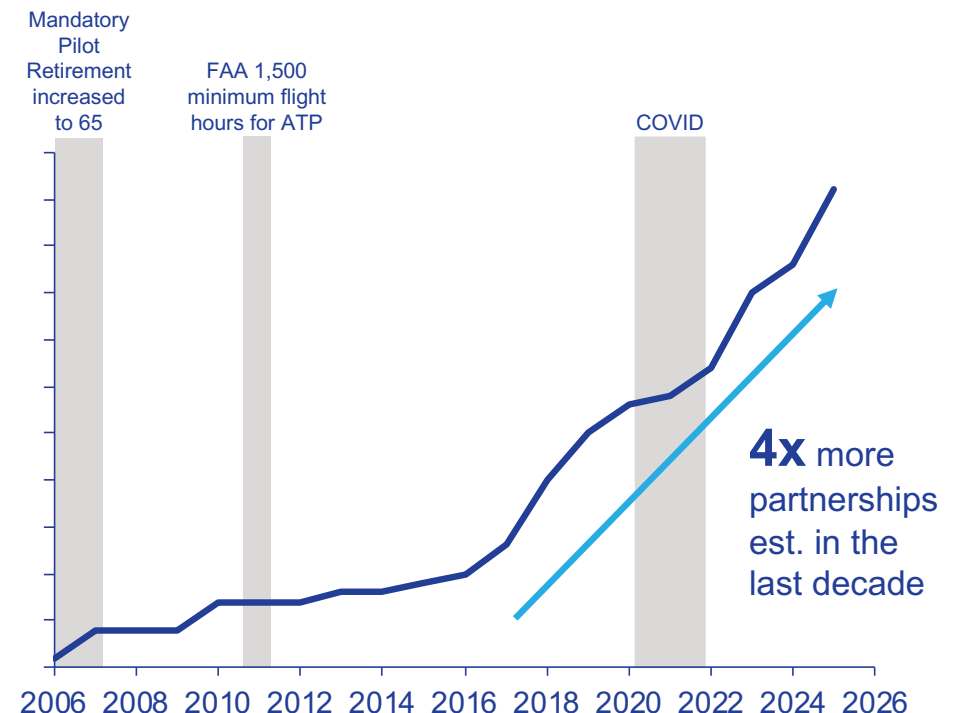
As labor pressures persist, airlines and MROs are taking a more deliberate approach to talent development. In many regions, the industry is shifting from reactive recruitment toward longer-term pipeline management that begins earlier in the career path.

For pilots, airlines are placing greater emphasis on school partnerships, cadet programs, and airline-branded training pathways. These models help reduce uncertainty for students while allowing airlines to influence training quality, pace, and alignment with operational needs. Scholarship support, financing arrangements, and conditional employment pathways are increasingly being used to make the profession more accessible.

MROs are strengthening relationships with technical schools, community colleges, and OEM-supported programs. These partnerships help close the gap between classroom instruction and aircraft maintenance readiness. Investment in early career education helps align curricula with fleet requirements, maintenance practices, and documentation standards. Cabin crew training follows a similar pattern, with airlines investing in modern training centers to support safety, service, and operational consistency.

Control of the talent pipeline is becoming a competitive advantage.

Airlines and service providers that align recruitment, training, qualification, and retention will be better positioned to manage labor risk and support future growth. This is particularly important in developing markets, where local training capacity can expand recruitment, and in mature markets, where replacement demand will remain elevated.





BUILDING READINESS THROUGH CBTA

Competency-Based Training and Assessment (CBTA) continues to gain broader acceptance across airlines, regulators, and training organizations. It better prepares aviation personnel to respond to operational scenarios through a combination of technical and non-technical skills developed through continuous targeted training. CBTA emphasizes demonstrated capability, decision-making, and consistency under realistic operating conditions. Opposed to focusing on task completion or regulatory compliance, this approach is increasingly important as fleets become more complex and operational expectations rise.

CBTA is also moving earlier in the training lifecycle. Traditional ab-initio programs, which were often centered on minimum flight hours and task checklists, are being replaced by competency frameworks built around ICAO core competencies, behavioral indicators, and scenario-based learning. Early exposure to operational complexity helps students develop technical skills, judgment, resilience, and decision-making for real-world environments. This shift better aligns training with line operations and supports a smoother transition from instruction to operational readiness.

The broader adoption of CBTA supports a more integrated training continuum from aptitude development through recurrent training. It enables more individualized progression, more efficient use of training resources, and closer alignment between learning outcomes and operational requirements. For pilots, cabin crew, and maintenance technicians, this creates a more direct path to readiness.

The Pilot Competency Framework





THE NEXT GENERATION OF TRAINING

The aviation training market is undergoing a digital transformation, driven by air travel growth, workforce challenges, and increasing operational complexity. Traditional training models based on a fixed curricula are increasingly unable to meet the demand.

Over the forecast period, artificial intelligence will emerge as an important enabler of next-generation training. It will support a more scalable, efficient, and data-driven learning system across pilot, cabin crew, and maintenance training. Potential applications of AI can bring advances in areas like adaptive simulations, complex scenario generation, automated performance feedback, and predictive analytics with recommended after actions. Immersive technologies such as virtual reality and augmented reality are also gaining traction, improving familiarization with the flight deck, cabin environment, aircraft systems, and maintenance procedures.

At the same time, adoption will remain measured. Aviation is a safety-critical industry, and broader use of AI will depend on regulatory alignment, governance, data quality, instructor readiness, and system transparency. Many AI models remain difficult to validate, and concerns related to bias, accountability, and privacy will need to be addressed before deployment at scale.

Human factors will also remain central. The industry will need to manage the risk of over-reliance on automation and ensure that digital tools complement, rather than replace, instructor judgment and technical expertise. Validation requirements will be high, and systems will need to perform consistently across a range of operational conditions. As a result, AI adoption in training is likely to advance in measured stages rather than through rapid, system-wide change.



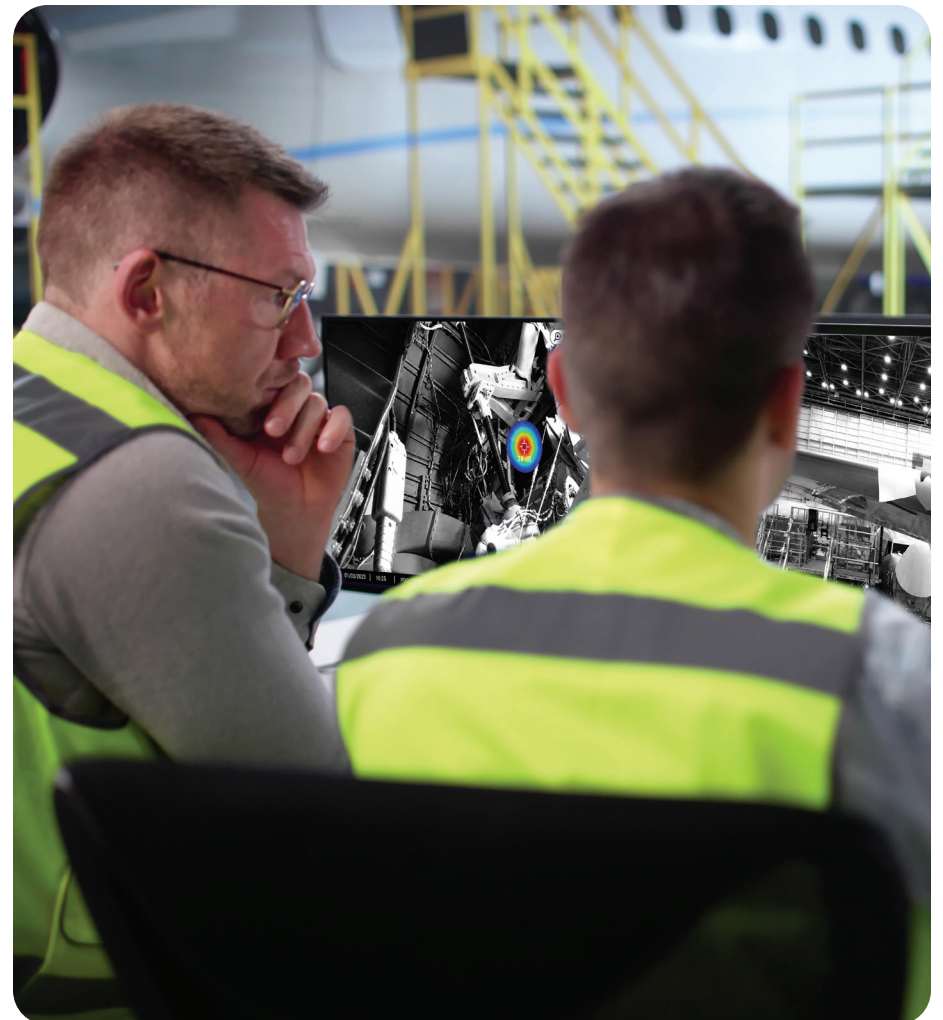


OUTLOOK

The aviation workforce is entering a new phase of transition. While post-pandemic hiring has moderated, labor pressures remain elevated in key segments, particularly maintenance. Retirement replacement, fleet growth, and ongoing attrition will continue to shape personnel demand over the forecast period.

In response, airlines, MROs, and training providers are strengthening pipeline programs, expanding partnerships, and investing earlier in career development. CBTA is becoming a more important part of workforce readiness, helping to close the gap between certification and operational performance. Digital tools and AI-enabled training solutions are expected to reshape how aviation personnel are prepared, but implementation will remain disciplined and safety-driven.

The industry's next workforce challenge is not only to recruit more people, but to build resilient and scalable pathways to develop, retain, and prepare the next generation of aviation talent.



FORECAST ON A PAGE

Boeing Pilot and Technical Outlook 2026 - 2045

	Africa	China	Eurasia	Latin America	Middle East	North America	Northeast Asia	Oceania	South Asia	Southeast Asia	World
Airline Traffic Growth (RPK) (2025-2045)	5.8%	5.0%	2.8%	4.1%	4.3%	2.7%	2.1%	2.8%	6.8%	6.7%	4.0%
Airline Fleet Growth (2025-2045)	3.9%	4.0%	2.3%	2.8%	3.5%	1.2%	1.7%	1.4%	6.9%	6.5%	3.0%
Aircraft Deliveries (2026-2045)											
Regional Jet	40	405	90	5	0	810	25	10	25	25	1,435
Single Aisle	870	7,215	6,920	2,160	1,505	6,350	825	565	3,055	4,080	33,545
Widebody	240	1,460	1,405	230	1,370	945	635	185	390	855	7,715
Freighter	15	160	175	10	120	300	100	5	20	25	930
Total	1,165	9,240	8,590	2,405	2,995	8,405	1,585	765	3,490	4,985	43,625
Services (2026-2045 \$B)											
Information Services	\$45	\$260	\$305	\$80	\$95	\$305	\$50	\$25	\$65	\$125	\$1,355
Maintenance, Repair, Overhaul & Modifications	\$40	\$250	\$350	\$70	\$150	\$270	\$60	\$25	\$60	\$120	\$1,395
Parts & Distribution Services	\$50	\$325	\$485	\$100	\$215	\$380	\$80	\$30	\$80	\$170	\$1,915
Training & Pilot Services	\$5	\$40	\$45	\$10	\$15	\$40	\$10	\$5	\$15	\$10	\$195
Total	\$140	\$875	\$1,185	\$260	\$475	\$995	\$200	\$85	\$220	\$425	\$4,860
Services Growth (USD 2025-2045)	4.6%	5.0%	3.4%	3.8%	4.0%	2.5%	2.8%	2.6%	7.4%	6.5%	3.7%
New Personnel (2026-2045)											
Pilots	22,000	123,000	153,000	38,000	67,000	122,000	24,000	11,000	48,000	66,000	674,000
Technicians	25,000	131,000	169,000	42,000	65,000	125,000	28,000	12,000	48,000	83,000	728,000
Cabin Crew	28,000	171,000	249,000	56,000	104,000	191,000	43,000	18,000	54,000	109,000	1,023,000
Total	75,000	425,000	571,000	136,000	236,000	438,000	95,000	41,000	150,000	258,000	2,425,000

2026 – 2045 Pilot and Technician Outlook

New Personnel Demand

2,425K



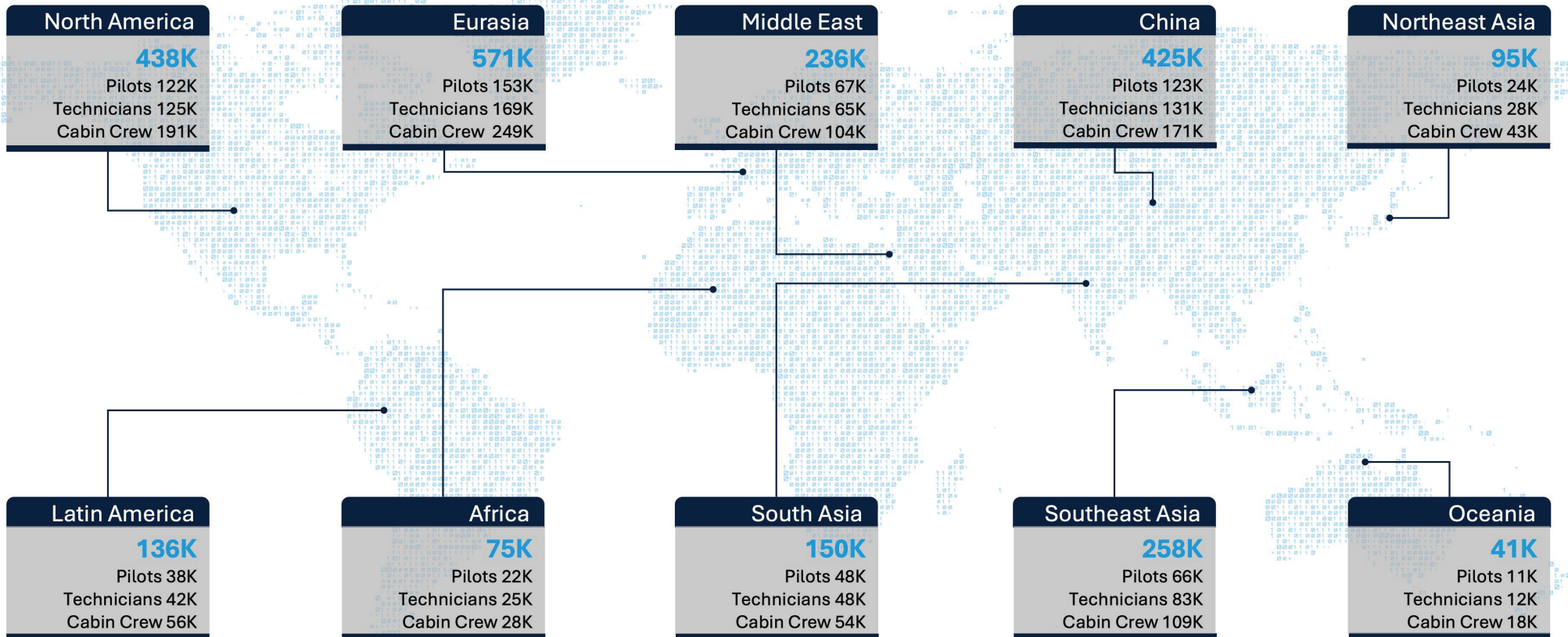
674K Pilots



728K Technicians



1,023K Cabin Crew





Boeing Global Services
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