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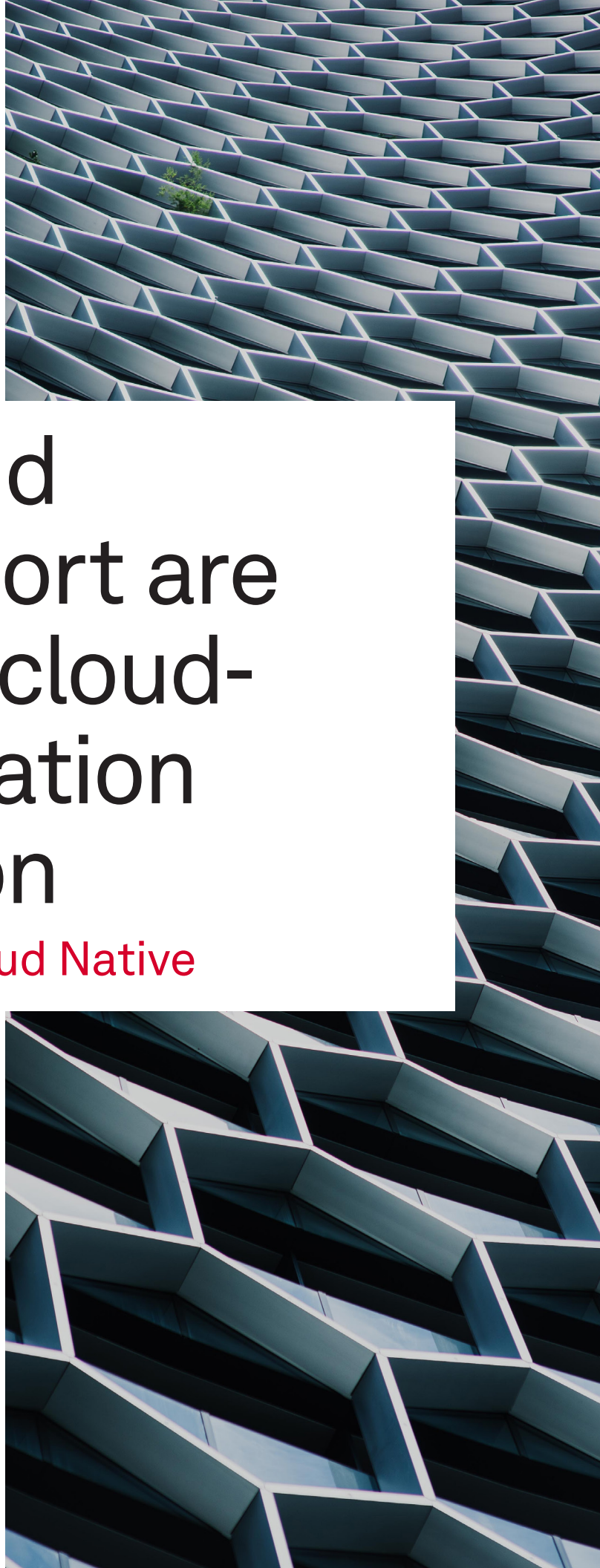


Agentic AI and partner support are accelerating cloud-native application modernization

Highlights from VotE: Cloud Native

January 20, 2026

by William Fellows

451 Research's Voice of the Enterprise: Cloud Native, Modernization 2025 survey illustrates how the complex task of modernizing application estates to support operational efficiency and customer satisfaction is benefiting from the advent of cloud-native AI tooling and third-party service expertise.

Introduction

Key business outcomes such as operational efficiency and customer satisfaction rely as much on modernized application estates as on underlying infrastructure. 451 Research's Voice of the Enterprise: Cloud Native, Modernization 2025 survey reflects the emerging role of AI-powered cloud-native tooling and the importance of third-party service expertise in application modernization efforts. It is a complex undertaking with significant security considerations, which industries are approaching in varying ways. Fielded in November and December 2025 with a panel of 570 cloud-native technology users, the survey analyzes application modernization strategies, the role of agentic AI in application modernization and cloud management, and how third parties are leveraged.

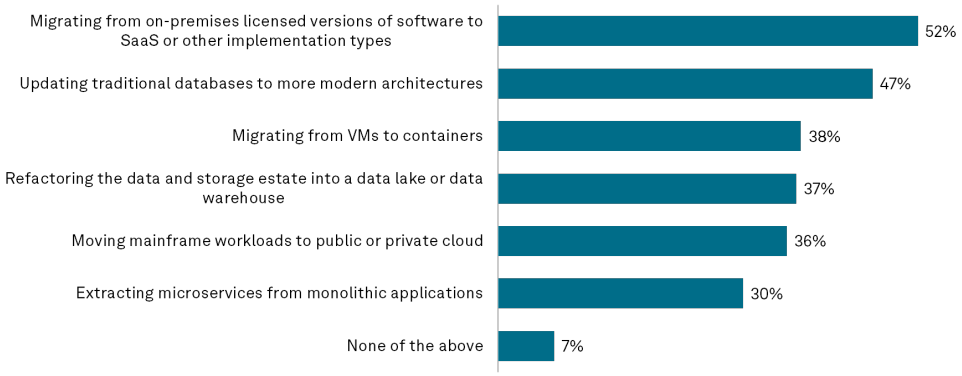
THE TAKE

To support the modernization of their data estates in the emerging "era of AI," organizations are broadly seeking to move away from on-premises licensed software. Autonomous and agentic AI features, built on cloud-native foundations such as Kubernetes and containers, are increasingly deployed to enhance ROI and relieve time-consuming bottlenecks that could otherwise stall modernization projects. In application modernization — often part of a mandated, wholesale modernization of IT estates — cost, complexity and security are key challenges. Crucially, this is not a "go it alone" motion, as organizations are seeking assistance from third parties with domain expertise, sector experience and shared knowledge.

Summary of findings

Software-as-a-service adoption and data preparation are foundational for application modernization projects. The principal ways that organizations are modernizing or planning to modernize applications are by migrating from on-premises licensed software to SaaS or other implementation models (52%), and by updating traditional databases to more modern architectures such as NoSQL (47%). These elements are foundational to achieving desired business outcomes (see Figure 1). Additional modernization measures include migrating from virtual machines to containers (38%), refactoring the data and storage estate into a data lake or data warehouse (37%), moving mainframe workloads to the cloud (36%) and extracting microservices from monolithic applications (30%).

Figure 1: Foundations for application modernization



Source: 451 Research's Voice of the Enterprise: Cloud Native, Modernization 2025.

Q. In which, if any, of the following ways is your organization currently modernizing or planning to modernize its applications? Please select all that apply.

Base: All respondents (n=516).

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Modernizing legacy apps is often part of a wider IT mandate. Regarding the scope of modernization ambitions, 30% of organizations say they are targeting only their most troublesome legacy applications, while 43% say they are conducting testing to determine which applications would benefit from modernization. Notably, more than one-fourth of organizations (27%) have a mandate to modernize their entire IT estates.

Many organizations are using agentic functions to manage cloud bursting, but regulated industries (with the highest cloud spending) lag. More than two in five surveyed organizations (42%) are using or planning to use autonomous/agentic AI functions to manage cloud bursting (i.e., deploying temporary resources to handle spikes in demand) in hybrid or multi-cloud environments, while a further 34% have this technology in discovery or proof of concept. Many enterprises remain risk-averse to the use of autonomous AI, often for compliance, regulatory or resilience reasons, especially when services are provided by third parties. Highly regulated industries, such as financial services, government and education, are further behind in implementing or piloting autonomous AI functions to manage cloud bursting (20% and 18%, respectively) despite having some of the largest cloud expenditures. Smaller companies by revenue and head count are also less likely to use this tooling.

Security concerns about AI decision-making must be addressed in safeguarding. The key concerns about using agentic AI for cloud bursting are security vulnerabilities introduced by AI decision-making (42%), compliance concerns (42%) and regulatory risks (41%). Other factors include the complexity of integrating with existing systems, skills gap/lack of expertise, lack of trust in AI-driven automation, risk of unexpected costs from autonomous bursting, and vendor lock-in or interoperability issues. Understandably, safeguards for security and policy enforcement (56%) are considered the key necessities before deploying agentic AI to manage hybrid cloud bursting, followed by human-in-the-loop approvals for bursting decisions (50%), auditing and explainability of AI decisions (47%), compliance validation tools (46%), and cost controls and budget guardrails (45%). Overall, organizations expect agentic AI to significantly accelerate decision-making for workload placement, cost-efficiency of bursting to cloud resources, security posture during cloud bursting, and preparedness for business continuity and disaster recovery.

Security and agility are key motivations for application modernization, with the highest response rates in financial services and manufacturing. More than half of organizations say improving security (54%) and improving operational agility (50%) are the key motivations and desired outcomes for their application or data modernization efforts. These factors reflect heightened concerns over geopolitical and macroeconomic conditions, as well as cyber and supply chain resilience. The pursuit of improved security through cloud-native application modernization is most frequently cited by financial services organizations (67%), while operational agility is the top reason in manufacturing (58%). Additional drivers include improving customer/user experience (43%), maximizing automation and AI/ML opportunities (37%), boosting operational/business resilience (36%), reducing hardware costs (35%) and increasing developer velocity (32%).

Addressing cost and security are key, especially in the public sector and financial services, while technical constraints are less prominent. Cost and budget limitations (44%) are the primary obstacles to organizations' application modernization efforts, rising to 83% among government/education respondents and 56% in financial services. Technical constraints come next, represented by legacy architecture complexity (34%) and data migration considerations (34%). These are followed closely by operational considerations, including business disruption/downtime risk (34%) and concerns about data privacy and security (33%).

Application modernization takes a village, but industries are not turning to global systems integrators and hyperscalers in equal measure. Hyperscalers, global systems integrators, independent software vendors and startups are all building expertise and tool sets to speed time-to-value for application modernization initiatives. Our study finds consultants, global systems integrators and public cloud infrastructure providers to be the biggest third-party beneficiaries of organizations' application modernization efforts. More than half say they would likely turn to GSIs (56%) and hyperscalers (55%) for help. However, this varies significantly across industries. In financial services, only 33% say they would turn to consultants and integrators, while 77% say they would use hyperscalers. In government/education, 68% say they would use consultants and integrators, while just 17% say they would use hyperscalers. The public sector has tended to use long-term partnerships with incumbent and long-certified consultants and GSIs for IT projects, whereas hyperscalers are newer accredited suppliers. Conversely, financial services companies have been among the biggest cloud spenders and have often eschewed the perceived lock-in constraints and "legacy" modus operandi of consultants and GSIs.

Most organizations expect AI coding tools to improve ROI. Half of the surveyed organizations expect that LLM-based tools for code generation and code understanding will generate a moderate improvement in ROI for application modernization projects. This optimism is especially pronounced in the manufacturing sector (75%). Almost all organizations either strongly agree (49%) or somewhat agree (41%) that they would be willing to put more data in the cloud to improve the efficacy of cloud-based AI/ML tools. At the same time, a quarter of organizations expect to modernize both their data layer and compute architectures together to support AI initiatives, rising to more than half of financial services companies. More than a third of organizations expect to modernize the data layer before compute architecture, and a similar percentage expect to modernize compute architecture before the data layer.

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