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ENT307

Mainframe workloads' fast track to agility

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“The main reasons that organizations are moving to the cloud are speed and agility.”

Andy Jassy

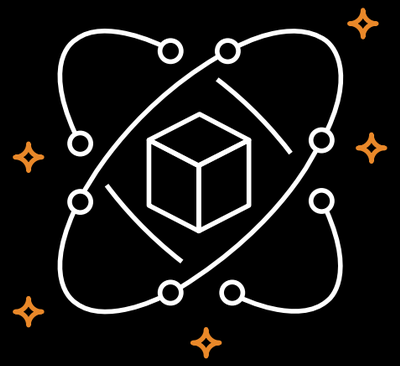
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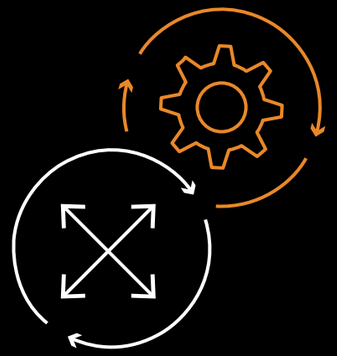
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12 agility attributes for mainframe workloads

1. Agile development with CI / CD
2. Integrated development environment
3. Knowledge-based development
4. Service-enabled and modular applications
5. Elasticity with horizontal scalability
6. On-demand, immutable, disposable servers
7. Choice of compute, data store, and language
8. Broad data store access
9. Pervasive automation
10. Managed and fully managed services
11. Consumption-based pricing
12. Innovation platform



Evolution tenets



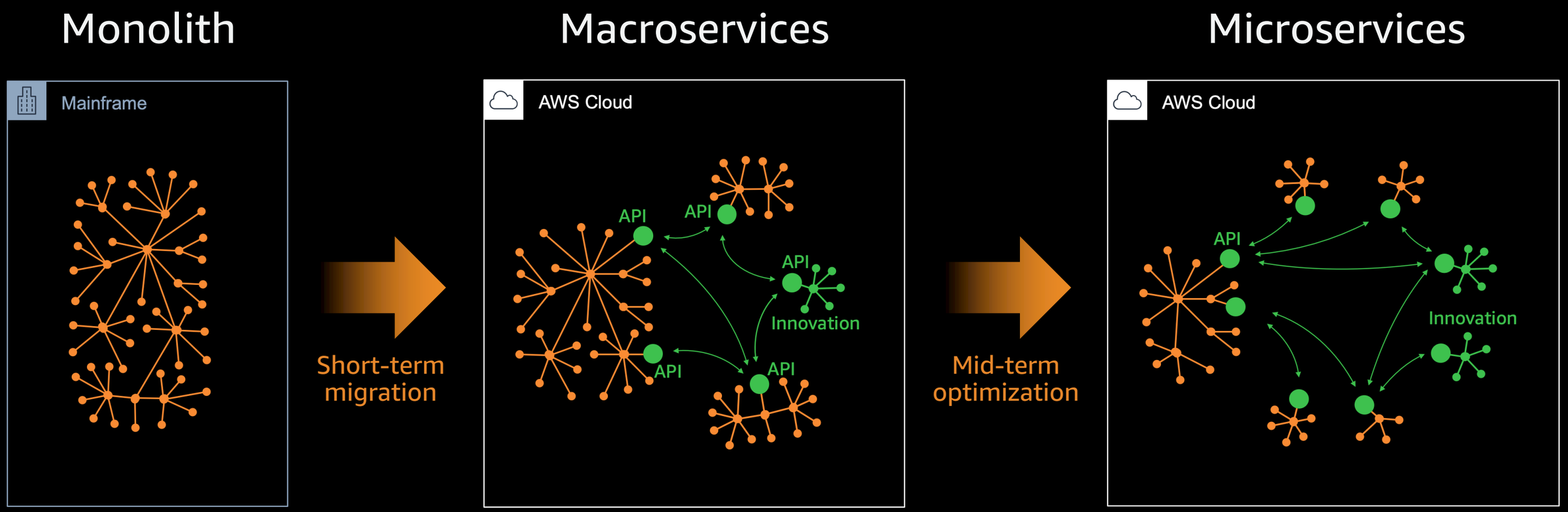
Maximize speed to value

- Value – maximize agility benefits in least amount of time
- Speed – highly automated, mature, and fit-for-purpose tools
- Achievable measurable business benefits in short term

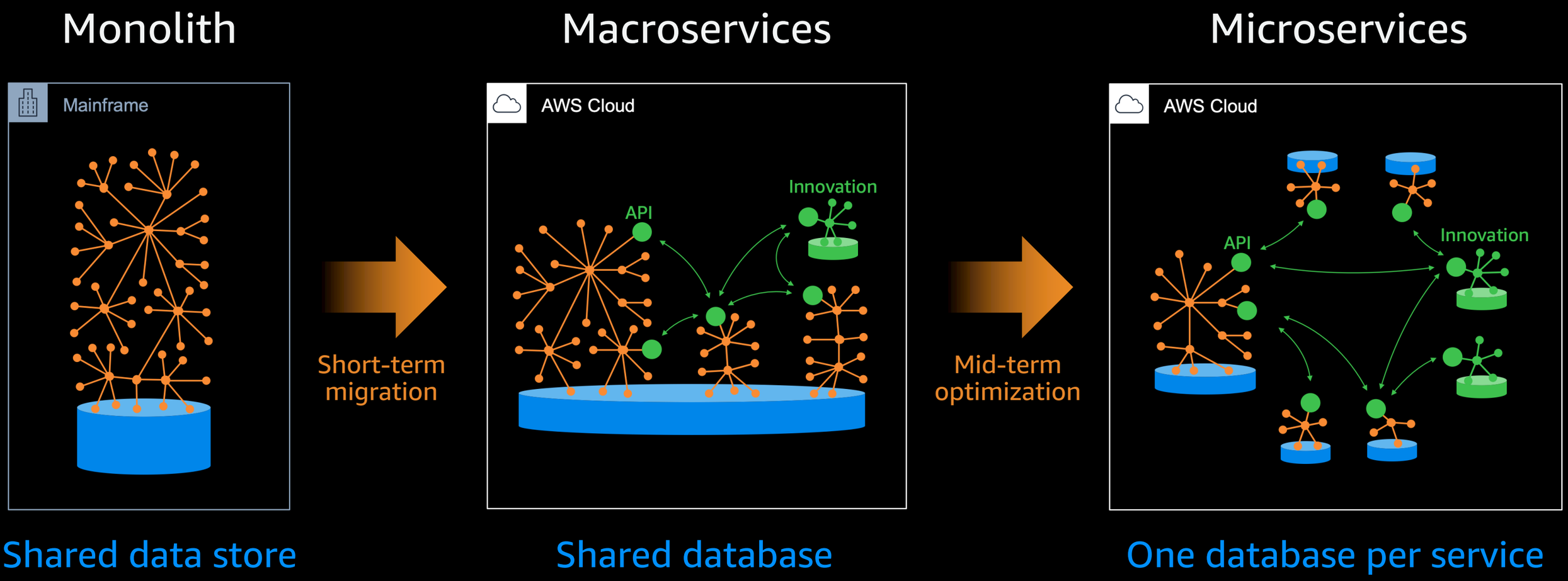
Minimize business and technical risks

- Evolutionary transitions – No rip-and-replace – No big bang
- Decomposition into workloads, then packages, then services
- Proven patterns and tools – Proven scalable infrastructure
- Hands-on pragmatic approach – Go build

Evolution to agile services



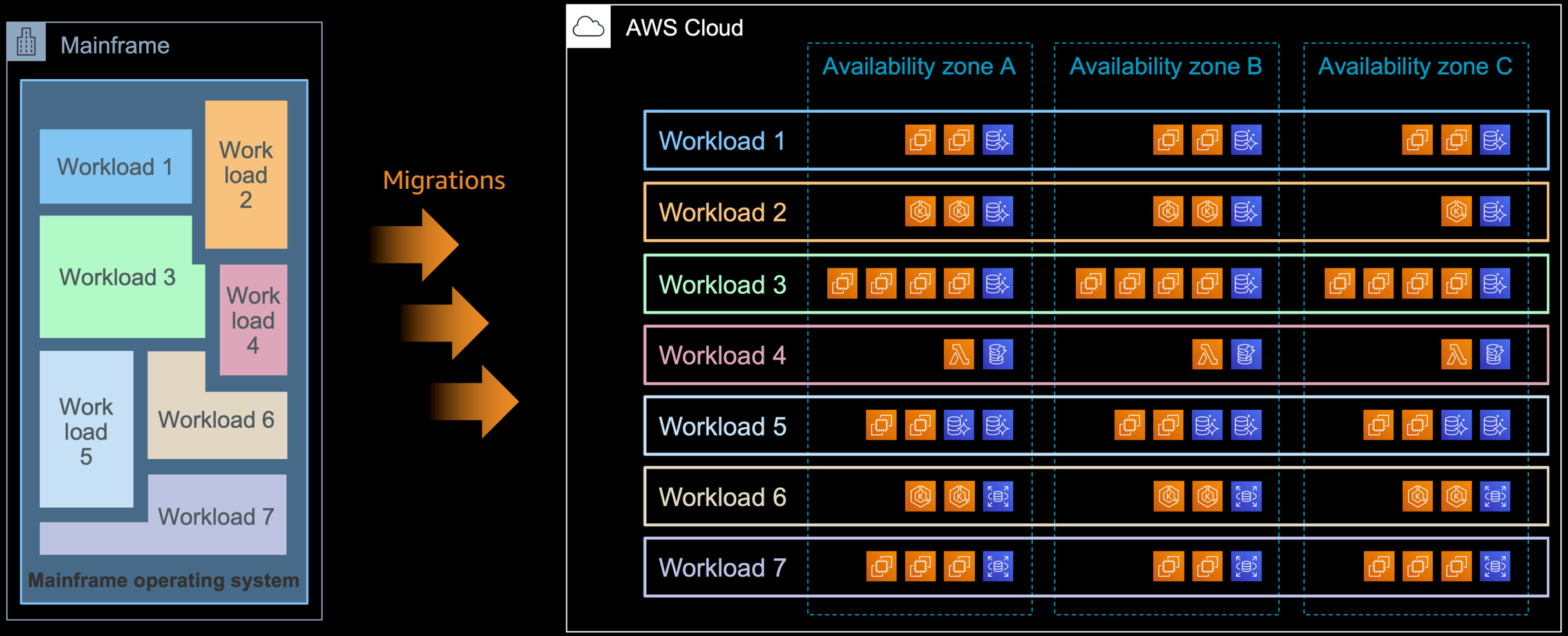
Data store evolution for agile services



Evolutions toward agility

	Current mainframe	Short-term cloud	Mid-term cloud-optimized
Infrastructure	Physical machines	Elastic compute Containers	Serverless functions Serverless containers
Application	Monolithic Legacy formats Central data store Tightly-coupled Proprietary	Macroservices Relational Shared database API services Modern stack	Microservices Cloud database One database per service Loosely coupled Polyglot architecture
Development	Waterfall approach Mainframe release cycles	Agile DevOps with CI/CD On-demand modern IDE Portfolio analyzer	DevSecOps Services extraction
System management	Fixed capacity System automation	Elasticity with scale out Managed services On-demand resources Infrastructure as code	Serverless Fully-managed services Fully automated
Cost optimization		Pay as you go On-demand instances	Pay for value
Innovation		Data analytics, business intelligence New channels, mobile, voice	AI/ML IoT

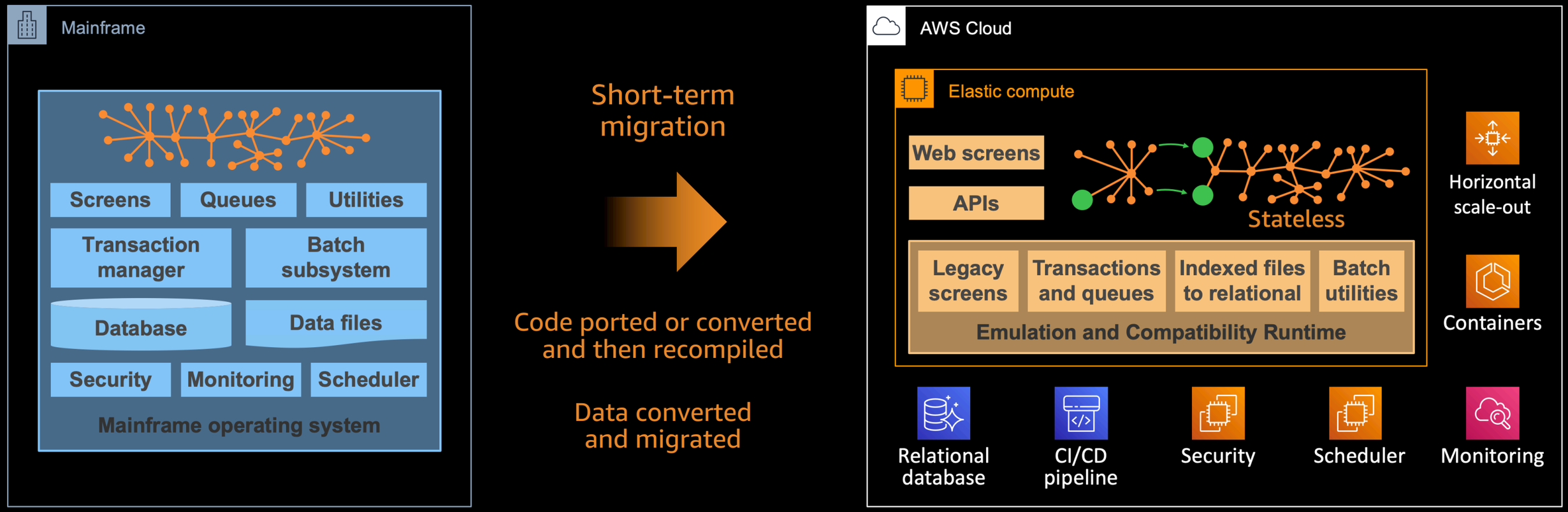
Mainframe strangling workload by workload



Vertical scalability
Legacy components
Tight coupling

Horizontal scalability
Modern software stack
Agile architecture

Tool-based workload migration

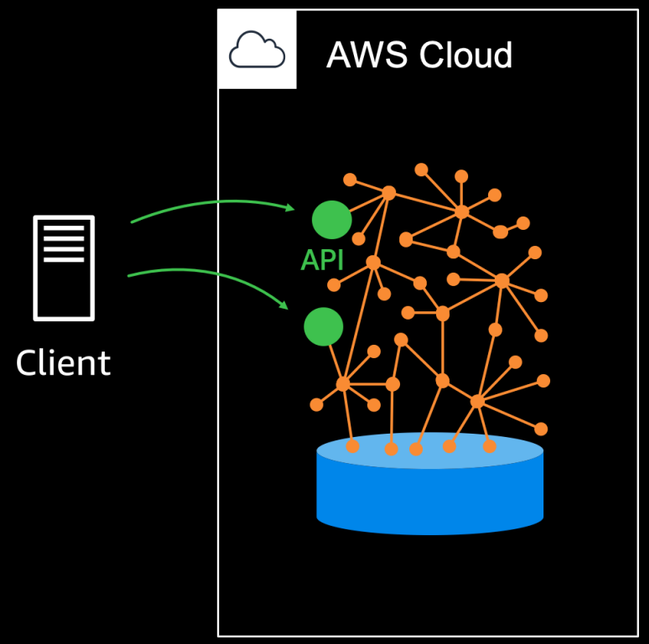


Migration accelerators:
Emulation and **automated refactoring**

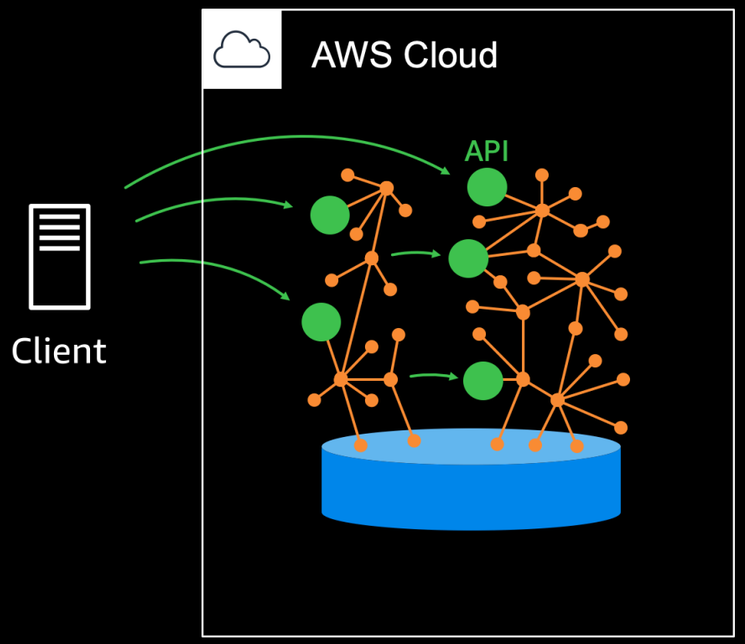
Creating macroservices

Macroservices

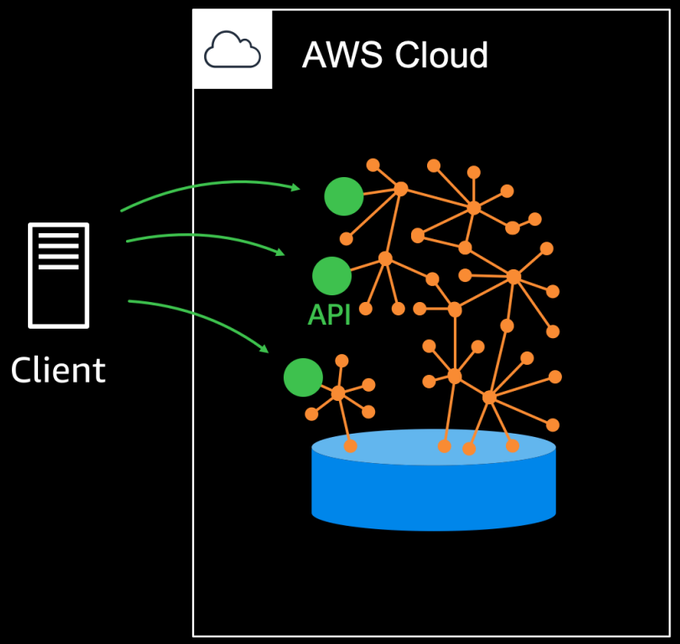
- Coarse-grained monolithic service for a large business domain
- Monolithic portion of a mainframe workload exposed as a service



API enablement

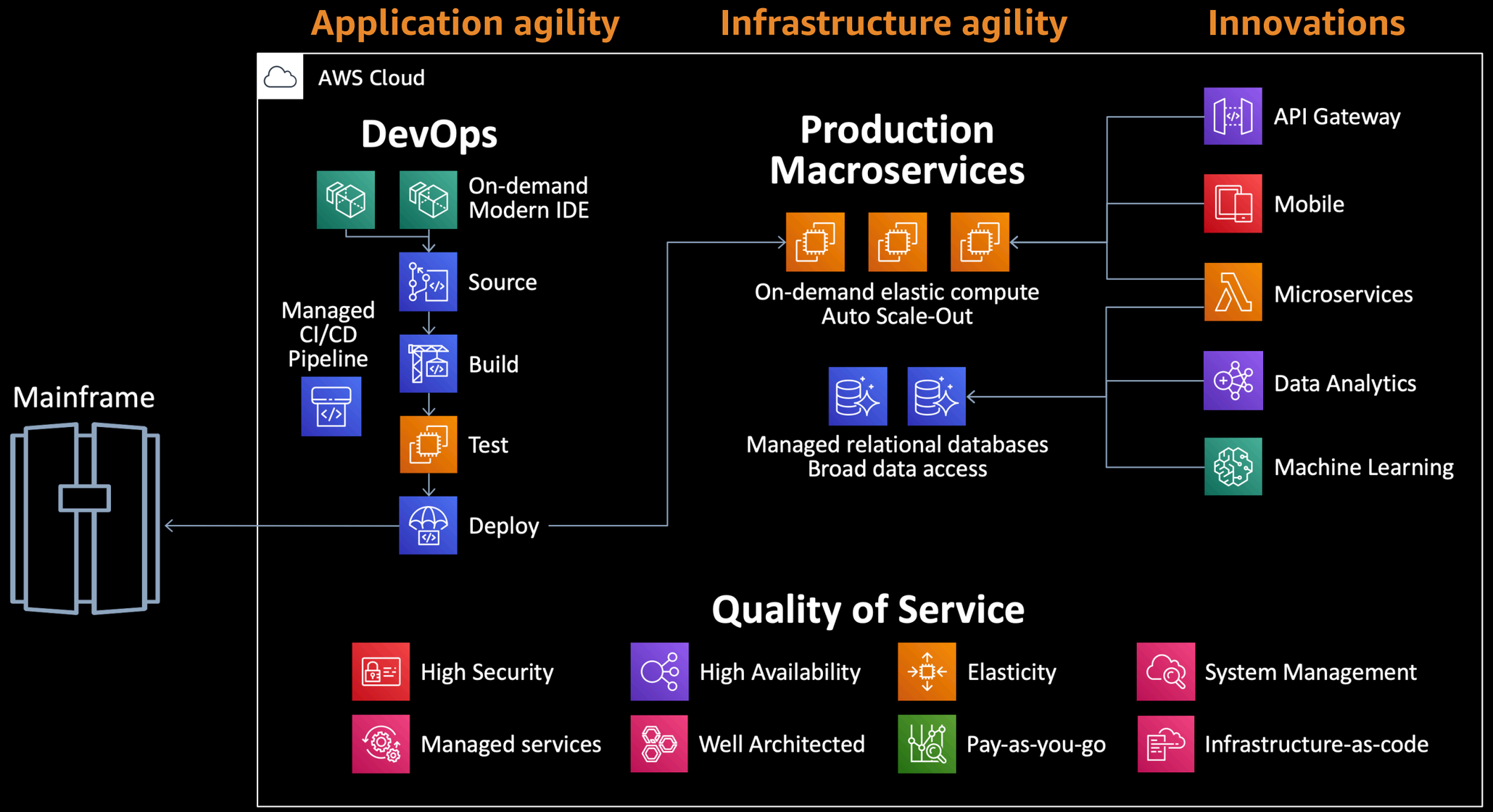


Front-end, backend separation

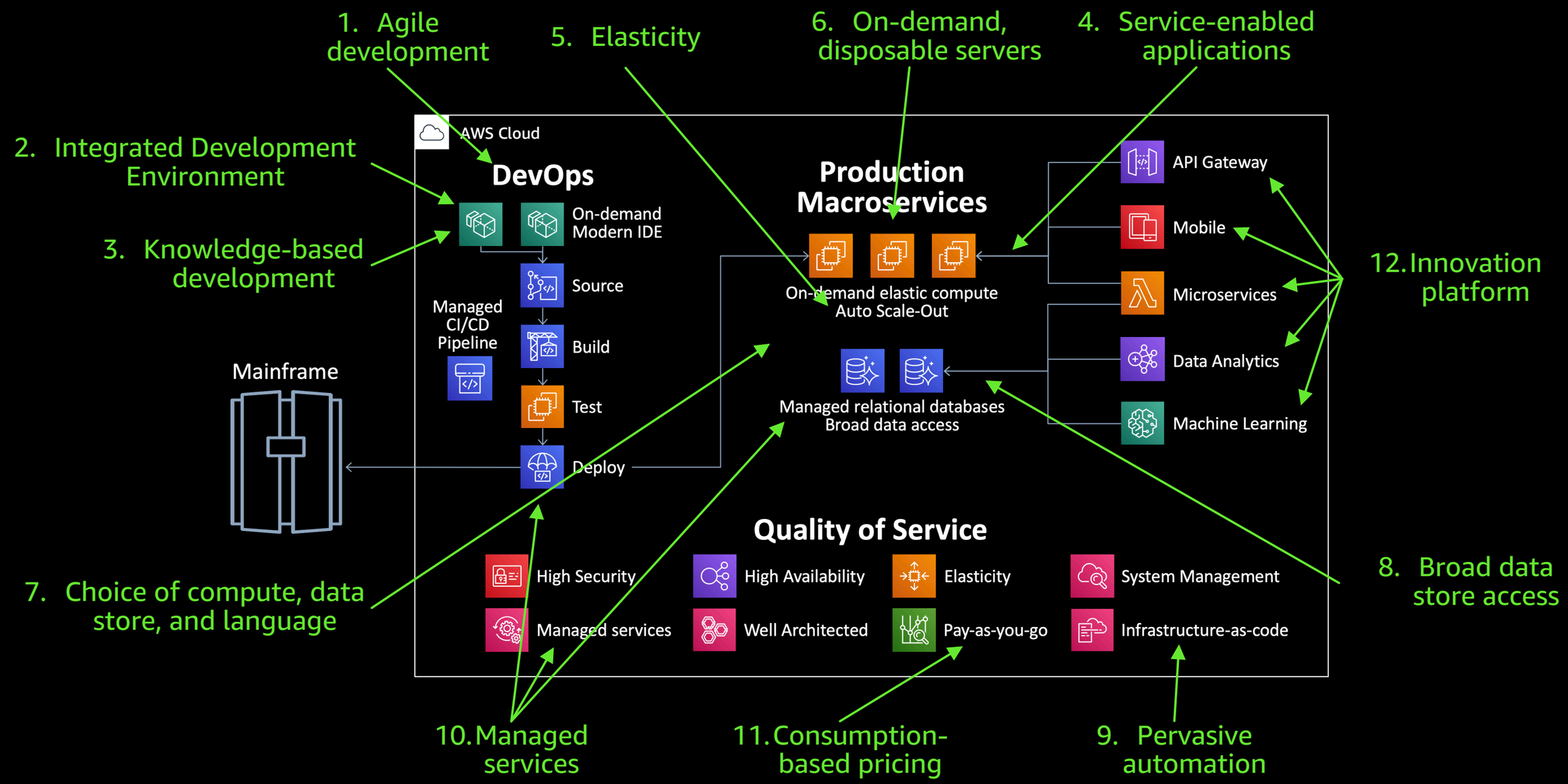


Independent programs or refactoring

Short-term Cloud architecture on AWS



Agility gains with macroservices



Optimize and innovate for more agility

Optimize

- More granular services towards microservices
- More automation with granular pipelines and infrastructure as code
- More managed or fully managed or serverless services

Innovate

- Data analytics, business intelligence, AI/ML
- New channels for mobile or voice
- New functions on serverless and containers
- Leverage innovation platform with 175+ AWS services



Microservices?

	Macroservice	Microservice
Key characteristics	Larger monolithic service Larger business domain Central shared database	Independent deployable service Modeled around a business capability Own its own data
Pros	Transactional integrity & ACID Simpler code reuse Simpler deployment Simpler testing Simpler operations	Organization autonomy Technology independence Polyglot architecture Scalability options Smaller blast radius
Cons	Teams' coordination More coupling Slower release cycles Monolingual	Distributed transactions, Saga, TCC Possible eventual consistency Operational complexity People skills gap

If using a shared database, it's not a microservice … yet

Extracting microservices

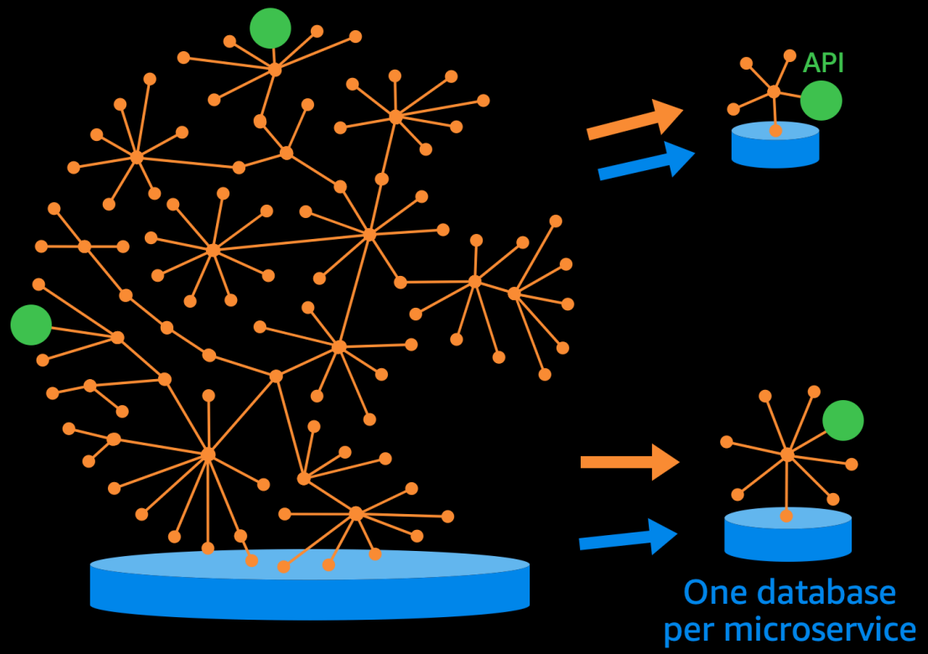
Programs' extraction

- Programs' grouping
- Transactional consistency
- Domain-driven design
- Bounded contexts via event storming

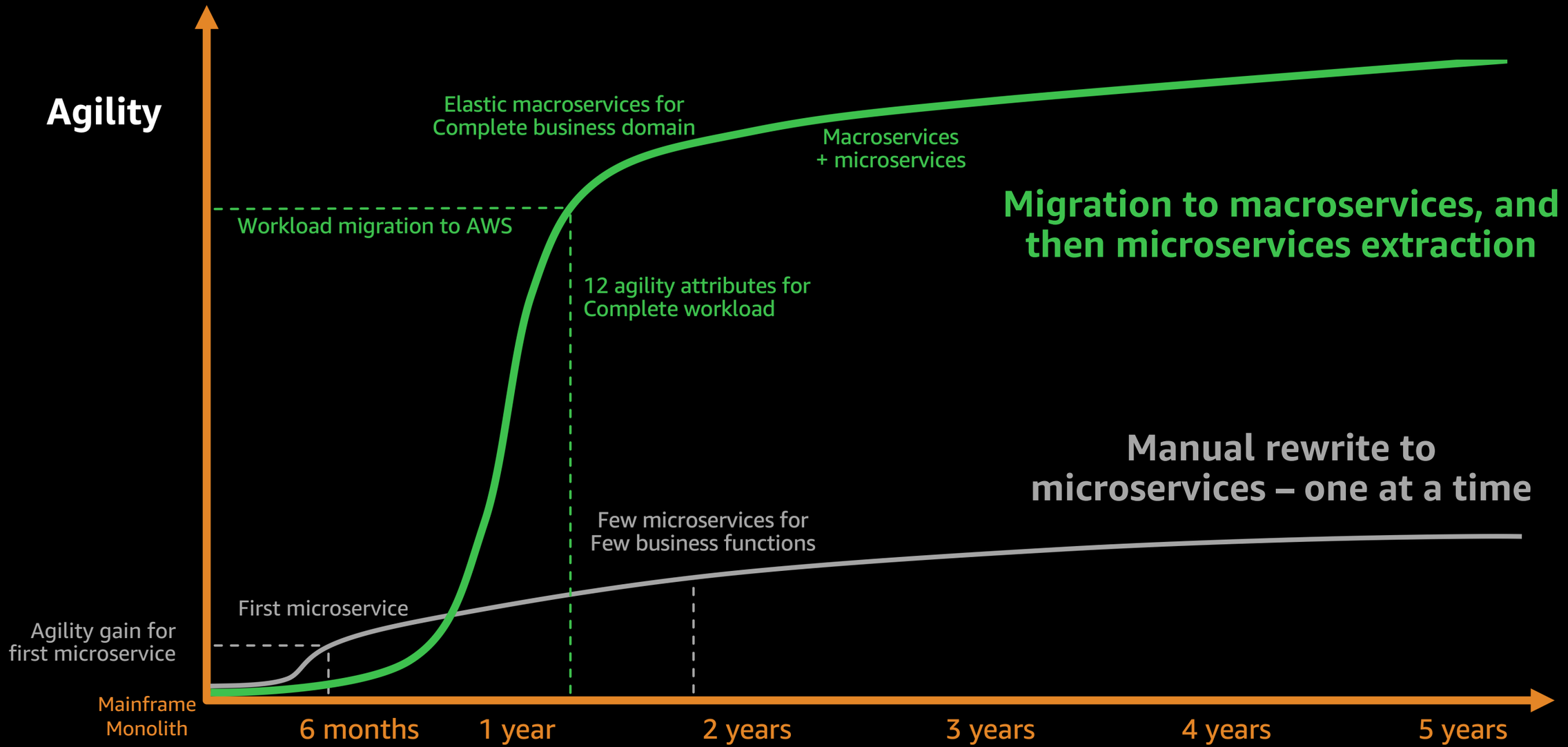
Data extraction

- Database split with schema separation
- Split patterns – Beware of consistency
- Sagas, TCC vs. distributed transactions

Pinpoint rewrite



Timeline to agility – Approaches comparison



For mainframe COBOL workloads with few million lines of code

Learn more

- Accelerating Agility with 12 Attributes for Mainframe Workloads
  https://aws.amazon.com/blogs/apn/accelerating-agility-with-12-attributes-for-mainframe-workloads/
- Demystifying Legacy Migration Options to the AWS Cloud
  https://aws.amazon.com/blogs/apn/demystifying-legacy-migration-options-to-the-aws-cloud/
- Mainframe to AWS customer stories and tools details
  https://aws.amazon.com/blogs/apn/tag/mainframe/
- *Monolith to Microservices* by Sam Newman, O'Reilly, 2019
- How to Peel Mainframe Monoliths for AWS Microservices with Blu Age
  https://aws.amazon.com/blogs/apn/how-to-peel-mainframe-monoliths-for-aws-microservices-with-blu-age/
- Enable agile mainframe development, test, and CI/CD with AWS and Micro Focus
  https://aws.amazon.com/blogs/industries/enable-agile-mainframe-development-test-and-ci-cd-with-aws-and-micro-focus/
- Introducing EventStorming
  https://leanpub.com/introducing_eventstorming

Resources

Cloud Migration Homepage: https://aws.amazon.com/cloud-migration/

Additional Migration Resources, AWS Prescriptive Guidance, AWS Enterprise Blog Collection: https://aws.amazon.com/cloud-migration/resources/

Migration Immersion Day: https://migration-immersionday.workshop.aws/en

All AWS workshops available here: https://www.workshops.aws/



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