Modernizing Applications

Transform your organization's app development

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Red Hat

Government Transformation

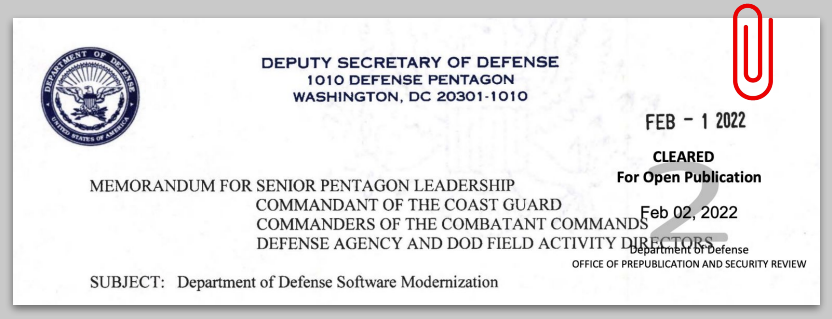
Executive Order on Improving the Nation's Cybersecurity

BRIEFING ROOM › PRESIDENTIAL ACTIONS

DECEMBER 13, 2021

Executive Order on Transforming Federal Customer Experience and Service Delivery to Rebuild Trust in Government

BRIEFING ROOM › PRESIDENTIAL ACTIONS



DEPUTY SECRETARY OF DEFENSE
1010 DEFENSE PENTAGON
WASHINGTON, DC 20301-1010

FEB - 1 2022

CLEARED
For Open Publication
Feb 02, 2022
Department of Defense
OFFICE OF PREPUBLICATION AND SECURITY REVIEW

MEMORANDUM FOR SENIOR PENTAGON LEADERSHIP
COMMANDANT OF THE COAST GUARD
COMMANDERS OF THE COMBATANT COMMANDS
DEFENSE AGENCY AND DOD FIELD ACTIVITY DIRECTORS

SUBJECT: Department of Defense Software Modernization

Information Technology:
IRS Needs to Complete Modernization Plans and Fully Address Cloud Computing Requirements

GAO-23-104719

Published: Jan 12, 2023. Publicly Released: Feb 07, 2023.

Social Security Administration:
Remote Service Delivery Increased during COVID-19, but More Could Be Done to Assist Vulnerable Populations

GAO-23-104650

Published: Nov 17, 2022. Publicly Released: Nov 17, 2022.

"At CDC and throughout public health, we are in a pivotal moment for data and surveillance — one marked by opportunities, challenges, and the need for change."
Dr. Rochelle P. Walensky, CDC Director

Can we succeed in these initiatives without modernization of app development?

https://www.whitehouse.gov/briefing-room/presidential-actions/2021/05/12/executive-order-on-improving-the-nations-cybersecurity/
https://www.whitehouse.gov/briefing-room/presidential-actions/2021/12/13/executive-order-on-transforming-federal-customer-experience-and-service-delivery-to-rebuild-trust-in-government/
https://www.cdc.gov/surveillance/data-modernization/index.html
https://www.gao.gov/products/gao-23-104719

Modernization > New Apps

"Enterprises are **prioritizing modernization** over new cloud-native application development because of the size and technical debt within existing application portfolios"

"The number of existing applications in a typical enterprise portfolio **dwarfs** new systems built each year. This imbalance implies that enterprises **must spend more on application modernization** than net new builds."

– Richard Watson, VP Analyst, Gartner

Source: Gartner Modernize and Run Existing Applications on Red Hat OpenShift Container Platform, Richard Watson, 1 December 2022. GARTNER is a registered trademark and service mark of Gartner, Inc. and/or its affiliates in the U.S. and internationally and is used herein with permission. All rights reserved.

OK, but why?

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Expectations are higher, we need to...

CHANGE FASTER	DEVELOP FASTER	DELIVER FASTER	INNOVATE FASTER
Increase the speed of change by **updating applications** to adapt to the markets and customers	Increase the speed of **developing new applications** to address new business opportunities	Increase the speed of **app delivery** of existing and new applications to your customers	Increase the speed of **innovation** across the organization to the pace that your business demands

Updated development tools & processes enhance delivery of business value

What if we don’t?

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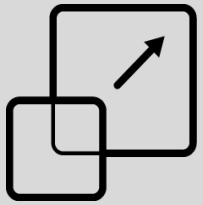
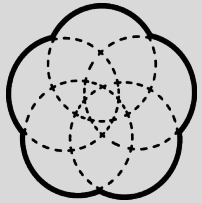
Software ages like milk, not like wine...



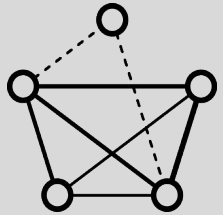
PLATFORM(S) STRUGGLE TO SCALE

Your architecture doesn't give you the agility you need to react to demand. It's also expensive in cost for underlying infra.



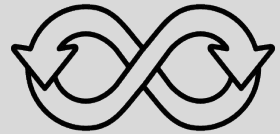
APPS & SERVICES ARE NOT COORDINATED ACROSS ENVIRONMENTS

You can't support rapid deployment & updates. Installation challenges. Differences in envs results in hard to debug issues.



INSECURE APPS AND ENDPOINTS

You lack the security and analytics on exposed endpoints. No way to get metrics on usage. Apps have exploitable (or unknown) security CVEs



CUSTOMER EXPERIENCE IS INCONSISTENT

Due to difficulty in connecting systems to data. Inability to transform data. Challenges with adding features or adding new lines of business.

What needs to change?

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Hard to Evolve/Maintain Systems

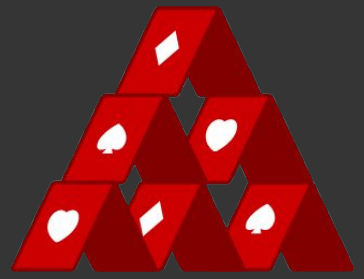
needy VMs, monolithic apps, legacy COTS, coupled components

Too Much Cognitive Load on Teams

Slow task completion, necessary rework, missed opportunities to innovate

Excess Technical Debt

reduces your team's agility, leads to poor quality, can create staffing issues



Strategy and Solutions

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Use Abstractions for Complicated Systems

"abstractions … can allow an application to ignore some of the problems with distributed systems" [1]

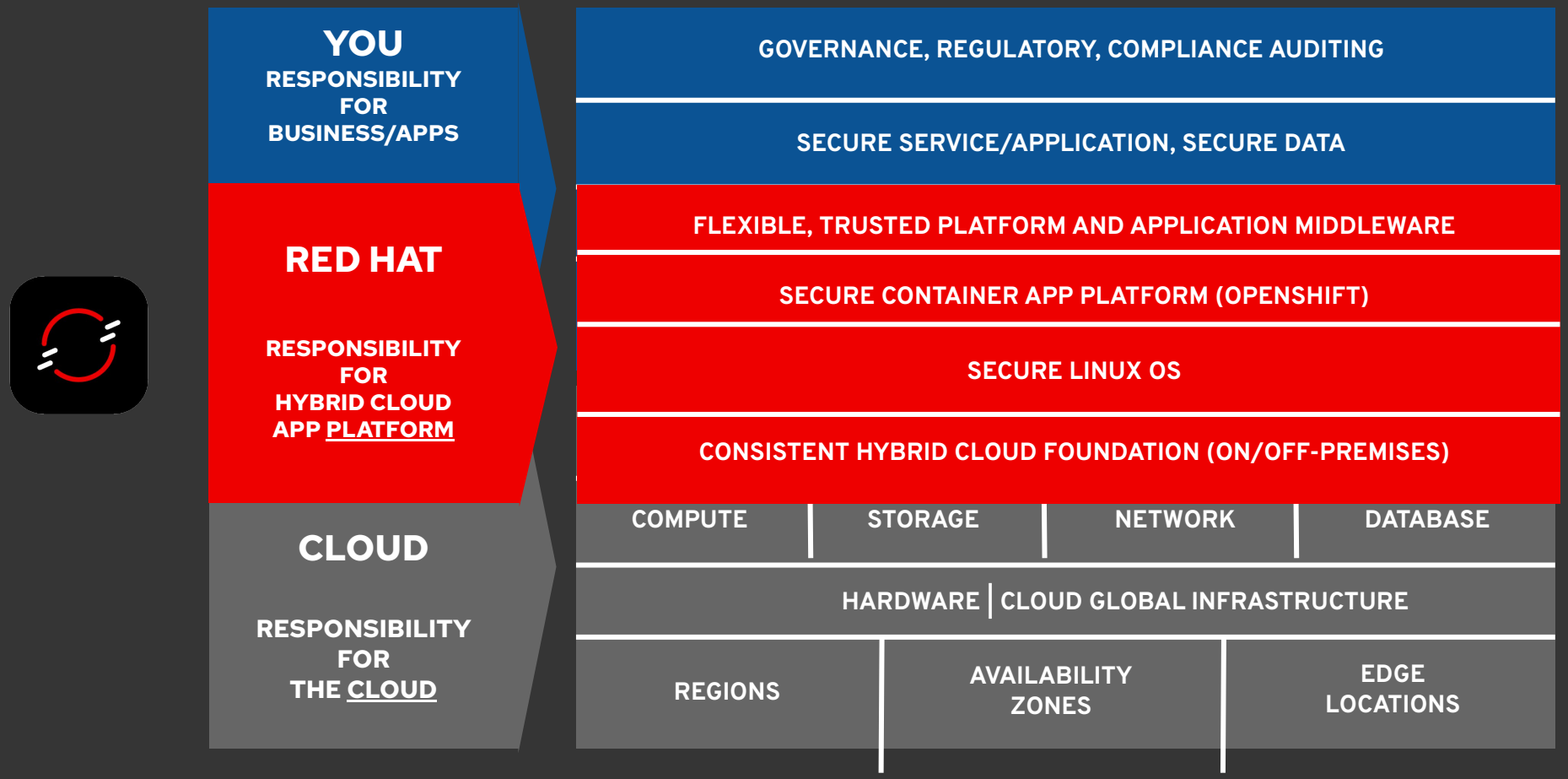
- Cloud-Based Compute and Storage
- Container App Platform Capabilities
- Serverless Architectures
- DevSecOps Pipelines

1. Simplify Software
2. Meet Non-Functional Requirements
   - Reliability
   - Scalability
   - Maintainability
   - Secure

1. Kleppmann, Martin. Designing Data-Intensive Applications, O'Reilly Media

Service Provider Abstractions

Offload Non-Functional Responsibility to Cloud & App Platform



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Build Great Teams, Reduce Cognitive Load

Realign to a model for end-to-end value delivery

- Stream-aligned teams[1]
- Focus on primary services
  → hand-off extraneous responsibilities
- Direct ownership of digital services meeting business requirements
  → "they build it, they run it"
- Internal Developer Platform (IDP)[2]

- Embrace Conway's Law
- Better Team Performance
- Increased Collaboration
- Improved Agility
- Take on Less Technical Debt

1. https://teamtopologies.com/key-concepts
2. https://www.redhat.com/en/topics/devops/what-is-an-internal-developer-platform

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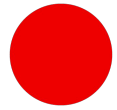
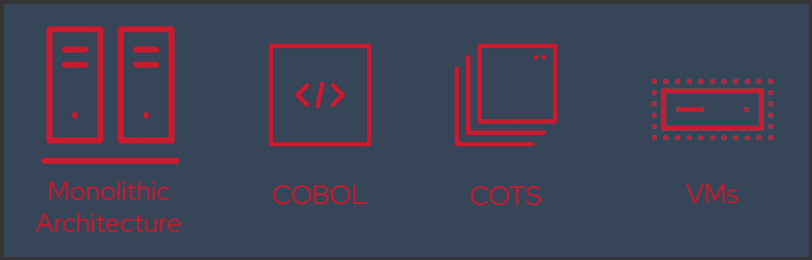
Modernization Strategies, 6Rs

Strategy	Definition / Example	Time	Migration Cost	Operational Cost	Business Benefit
Retire	Sunsetting the application.				
Retain	Continue running the application as-is.				
Rehost	Migrating an application as-is to a new platform. Example: Migrating virtual machines as-is to a new virtualization platform.				
Replatform	Making optimizations to the application that do not require re-architecture or significant code changes in order to achieve business or technical benefits. Example: Migrating an application into a container				
Refactor	Changing how an application is developed and/or architected, typically to be more cloud-native. Example: Strangling a monolith into microservices.				
Repurchase	Moving to SaaS or replacing portions of an application with software as a service offerings. Example: Consuming Kafka as a Service within an existing application.				

Use Case: Rapid Cloud Migration and Modernization



Many container migration projects stop at containerized...

...but even larger improvements in security, cost savings, quality, customer satisfaction, and ROI lie beyond initial migration.

– Incremental Modernization –

– Migration project –

End | Incremental Delivery | Incremental Delivery | Incremental Delivery | Incremental Delivery

Traditional state → Containerized → Cloud Native

Initial end state:

- Application has basic containerization
- Application features/functionality are unchanged, but deployment environment is new
- Deployments are semi-automated, some dependencies expressed as IaC

Red Hat OpenShift

Evolved state:

- Application is **resilient**, self-healing for better **customer experience**
- **APIs** are exposed for maximum **data sharing**, reduce time-to-market
- Deployments are f**ully automated** and fully expressed as code, in version control, to improve delivery **performance**, **auditability**, **security**
- Cloud native, portable, open standards

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Closing

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Modernization is happening

Application modernization continues to be a high priority

80%

of enterprise technologists surveyed **plan to modernize** more than half of their legacy applications **in the next 2 years**[1].

$28B

Expected size of application modernization services market by 2030, **growing** at 10.5% CAGR[2].

87%

of respondents in a recent IDG survey cited **modernizing** critical applications as a **key success** driver[3].

[1] The State of Application Modernization survey, Red Hat and konveyor.io, May 2022
[2] Application Modernization Services Market Research Report, 360iResearch, April 2023
[3] The Path to Digital Transformation survey, Foundry (IDG), January 2023

The State of Application Modernization Report 2022

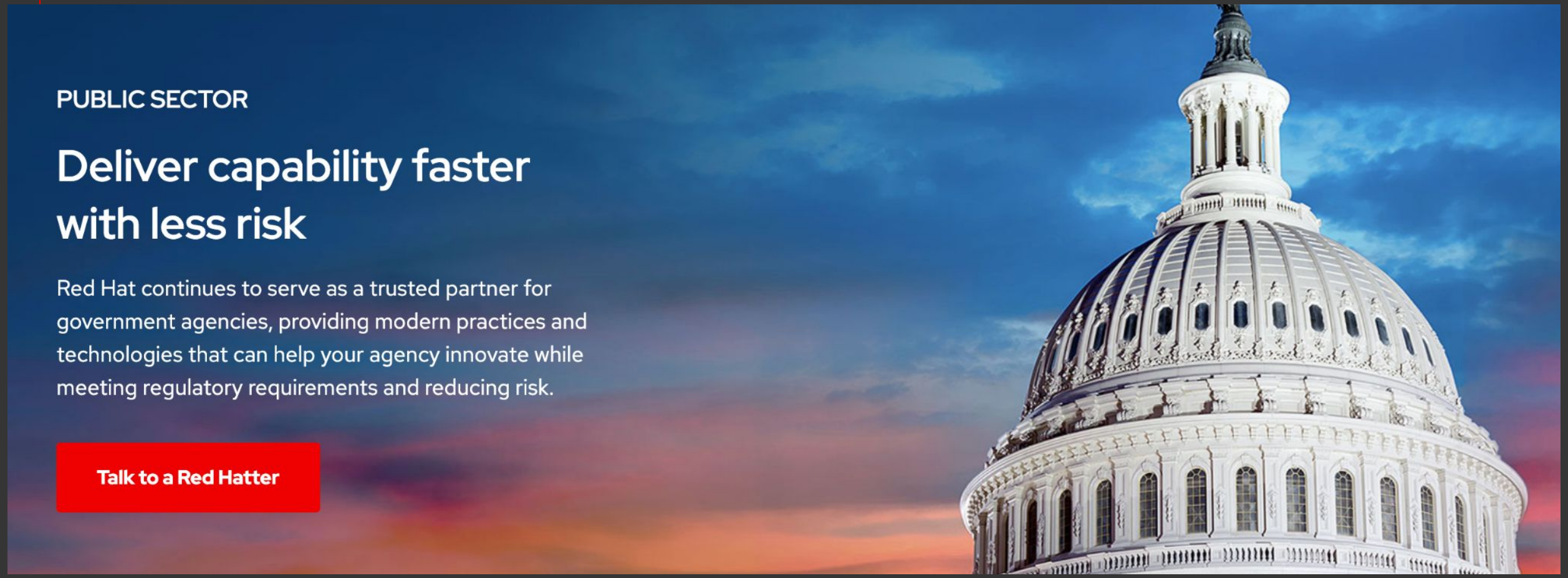
Learn why enterprises plan to modernize more than half of their existing applications to run on Kubernetes within the next year. And see how these 600 companies will approach the move, along with other key insights, to **inform your modernization strategy**.

konveyor.io/modernization-report

"The Internet was done so well that most people think of it as a natural resource like the Pacific Ocean, rather than something that was man-made. When was the last time a technology with a scale like that was so error-free? "

– Alan Kay, A.M. Turing Award Laureate, "father of personal computers"

Source:
https://www.drdobbs.com/architecture-and-design/interview-with-alan-kay/240003442



https://www.redhat.com/en/solutions/public-sector

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