



EBOOK

Modern Operations

A strategy for innovation and business growth

The days of flat networks, centralized users, and centralized technology stacks are over. To increase agility and pick up the pace of innovation, organizations are adopting the cloud, microservices, and DevOps tools and automation.

They're also accumulating a lot of complexity. Data and applications are now largely decentralized and may live in multiple public clouds, SaaS applications, third-party hosting providers, and the on-premise data center.

Users can be anywhere in the world.

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MODERN OPERATIONS FOR A FUTURE-READY BUSINESS

Software developers are using advanced tools and processes, including automation, microservices, and containers, to streamline their work, allowing them to focus more on making magic and less on tinkering with infrastructure.

Application development tools and processes have advanced significantly over the past years. But for many organizations, the operations side of IT hasn't always kept up. Many operations teams use legacy tools and processes that aren't designed to handle the complexity of distributed data and users, DevOps, microservices, and hybrid cloud.

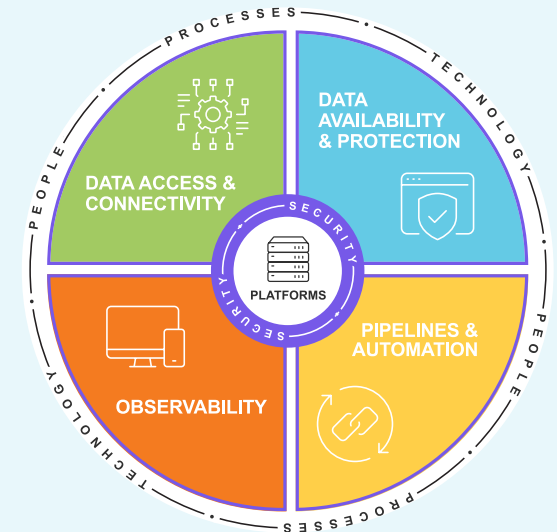
As a result, organizations may not be realizing the full value of their investment in transformation. At some point, a legacy operating model will slow innovation, if it hasn't already.

Today, it's critical that operations teams have the proper tools in place to support the innovations that developers are creating to drive business success.

A truly modern IT environment should enable growth and flexibility while incorporating end-to-end visibility, security, and automation. It supports the modern software development environment by keeping developers happy – equipping them with advanced operational tools to keep innovation flowing.

Modern Operations is built around three core principles:

- 1 It's developer-friendly to streamline the work of those who are driving innovation.** If your operations model doesn't adequately support software developers, they'll take a different approach – shadow IT, for example.
- 2 It's driven by code, not hardware.** Infrastructure as code provides the flexibility needed to keep pace with software development and manage the complexity of running workloads across multiple clouds and the on-premises data center.
- 3 It's automated end-to-end.** The microservices architecture is quite complex and can't be managed manually. Modern Operations requires an automated code-driven process to safely orchestrate the movement of data services to the right people at the right time.



The Anatomy of Modern Operations

Modern Operations encompasses the processes, skills, and tools needed to effectively manage hybrid cloud environments, including the public cloud, cloud-native services inside your data center, and your traditional IT estate.



- Modern Operations requires operational discipline
- to manage the complexity and risk of a hybrid
- cloud environment.



Operating in the public cloud or using cloud-like services on-premise introduces a new set of tools, processes, and skills that don't always align well with the same capabilities in the traditional data center.

While IT operation teams are highly skilled at performing traditional tasks and processes, some lack the tools and knowledge base to maintain and support modern applications. The complexity of underlying services and interdependencies that support the application, coupled with the dynamic nature of container environments, makes traditional monitoring insufficient and outdated.

To support a modern applications development environment, IT operations teams must make the transition from traditional processes and tools to cloud-centric. That's because today's complex, expansive, and fast-changing application environments require intelligent analytics to help make data-driven performance and security decisions.

Modern Operations collects, aggregates, and analyzes vast amounts of data from multiple scattered sources to gain insights into what's happening in real-time. The result is improved efficiency, resilience, and responsiveness

Modern Operations requires operational discipline to manage the complexity and risk of a hybrid cloud environment.

Transitioning to Modern Operations is a journey that incrementally elevates humans from the mundane portions of the operations loop so that decision-making and remediation happen automatically. It's not about reinventing the wheel. It's about applying the necessary operational discipline needed to tame complexity, manage the risk of a hybrid cloud environment, and ensure business continuity.

It's about equipping experienced operations professionals with a framework to ensure the practices and disciplines they're already proficient in are extended beyond the data center into the multiple clouds that make up today's hybrid architectures.

Modern Operations helps organizations realize the full value and potential of their technology investments.

Organizations have invested a lot in their digital transformations, largely to achieve the agility and speed to innovate.

Modern Operations can deliver the availability, security, reliability, and performance that users and developers expect, giving organizations the opportunity to gain the full value of the innovation they're working to achieve.

If your modern applications and services don't run, aren't secure, or don't follow internal standards, you won't realize the value of your investment in transformation.

Modern Operations integrates the agility of the cloud into the data center.

Agility lets you pilot new ideas, experiment with new lines of business, and roll out application changes quickly. If you have agility in the cloud but not on-premises, then you're shorting yourself on the benefits of quick change and innovation.

Modern Operations enables operations teams to use the same development and delivery tools of the cloud inside of the data center, bringing the agility of the cloud to the data center.

Modern Operations enables innovation across platforms to drive business growth.

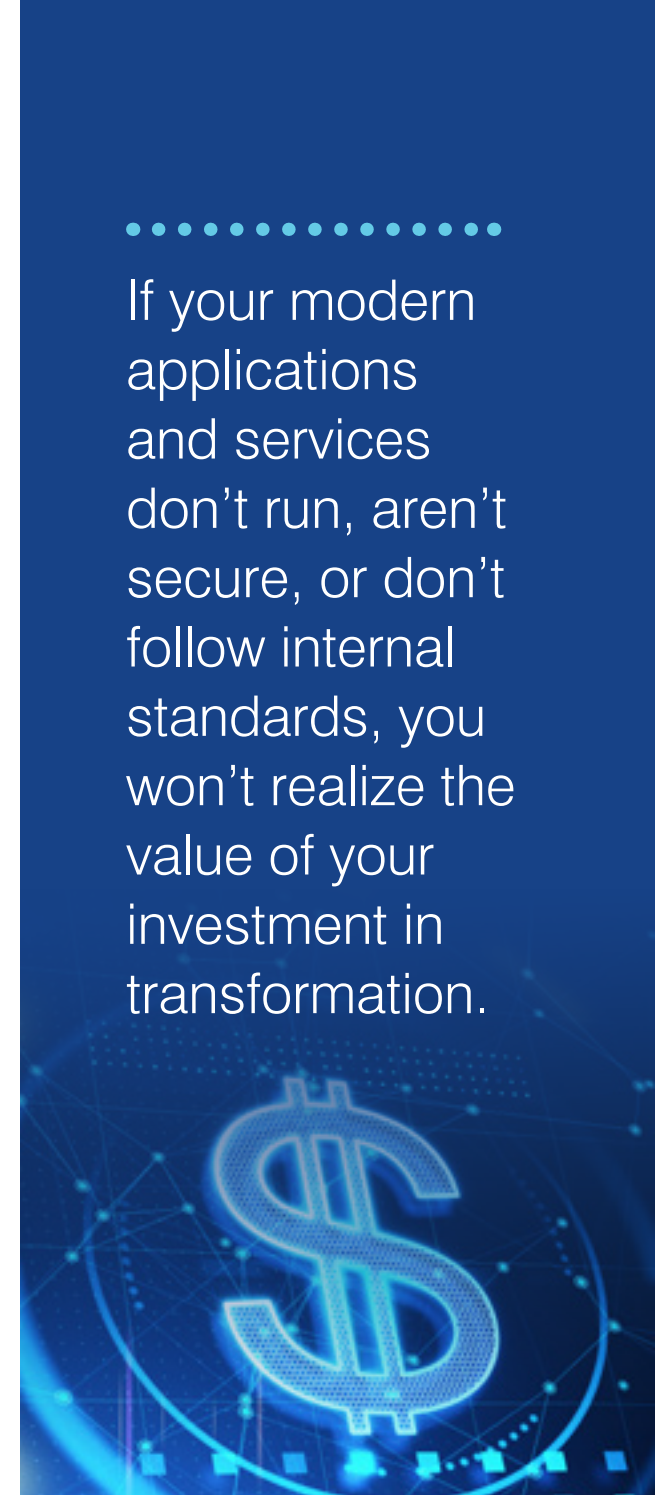
Today's software is deployed through pipelines. Operations teams can use pipelines in the same way to enable innovation across their data center and cloud footprints.

Modern Operations enables businesses to quickly adapt to unexpected or unprecedented change.

Modern Operations is the foundation for organizations to adapt, grow, and react to unpredictable or unprecedented change. In the event of a major unplanned disruption, Modern Operations enables organizations to quickly shift their strategy and invest in new areas.



If your modern applications and services don't run, aren't secure, or don't follow internal standards, you won't realize the value of your investment in transformation.



KEY COMPONENTS OF MODERN OPERATIONS

Modern Operations consists of six key components that create the foundation for reliable, resilient, and high-performance operations, comprehensively integrated with a holistic security approach.



Platforms and Systems

Business applications run on platforms such as on-premises data centers, the public cloud, and container environments. Platforms must be optimized for the workloads running on them. They must also be optimized for each aspect of Modern Operations: Networking, Pipelines and Automation, Observability, and Data Availability and Protection while ensuring security throughout your IT environment.



Networking

The network is the backbone of Modern Operations and handles the connectivity associated with assets that are distributed across multiple locations. It also provides users with secure identity-based access to resources regardless of where they're located.



Pipelines and Automation

In the Modern Operations environment, the work gets done through automation and pipelines. Automated pipelines deploy infrastructure and operational code and use APIs to automate integrations.



Observability

Observability helps make Modern Operations successful by delivering insights into the behavior of systems and applications, and the experience of end users, not just events. To handle hybrid cloud complexity, observability is automated, including automated detection of errors and faults. Automated remediation is also possible.



Data Availability and Protection

Data availability and protection is about using automation to ensure the right data is available to the right services and ensuring that operations teams can quickly recover from a loss of data, including the flexibility to shift workloads to different environments.



Security

Security can be implemented in a way that speeds the time to market. While many organizations focus on tools or compliance to drive security strategies and tactics, effective security requires a more holistic approach that includes integrating security tools to take full advantage of their capabilities, for example, building applications and services that inherit existing security controls.



PLATFORMS AND SYSTEMS

Organizations are struggling with operationalizing their platforms to meet the business needs of today and the future. Some may be struggling to turn a platform that's stable and reliable into one that's agile. Others are great at experimenting in the cloud but have trouble operationalizing the results. Both cases are examples of organizations in need of platforms and systems designed to accomplish their specific goals.

Platforms Should be Adaptable to Business Needs

Platforms are where business applications run — the data center and its storage, servers, and networking, as well as the cloud — and where virtual machines and container environments like Kubernetes live. Container environments can also be considered a platform.

Platforms must be optimized for the workloads running on them. To be effective, platforms must also be optimized to support the primary aspects of Modern Operations, including Networking, Pipelines and Automation, Observability, Data Availability and Protection, and Security.

Platforms must also be adaptable to changing business needs through software-defined compute and storage. You can excel in every other area of Modern Operations, but if you can't quickly change the platform, you'll fall short of delivering what the business needs, which is agility and speed.

For example, if a company wants to try something new and runs a pilot program, platforms should enable developers to quickly and easily set up a new environment through automation. And if a pilot program becomes popular with users, it needs the ability to rapidly scale up or down to meet demand.

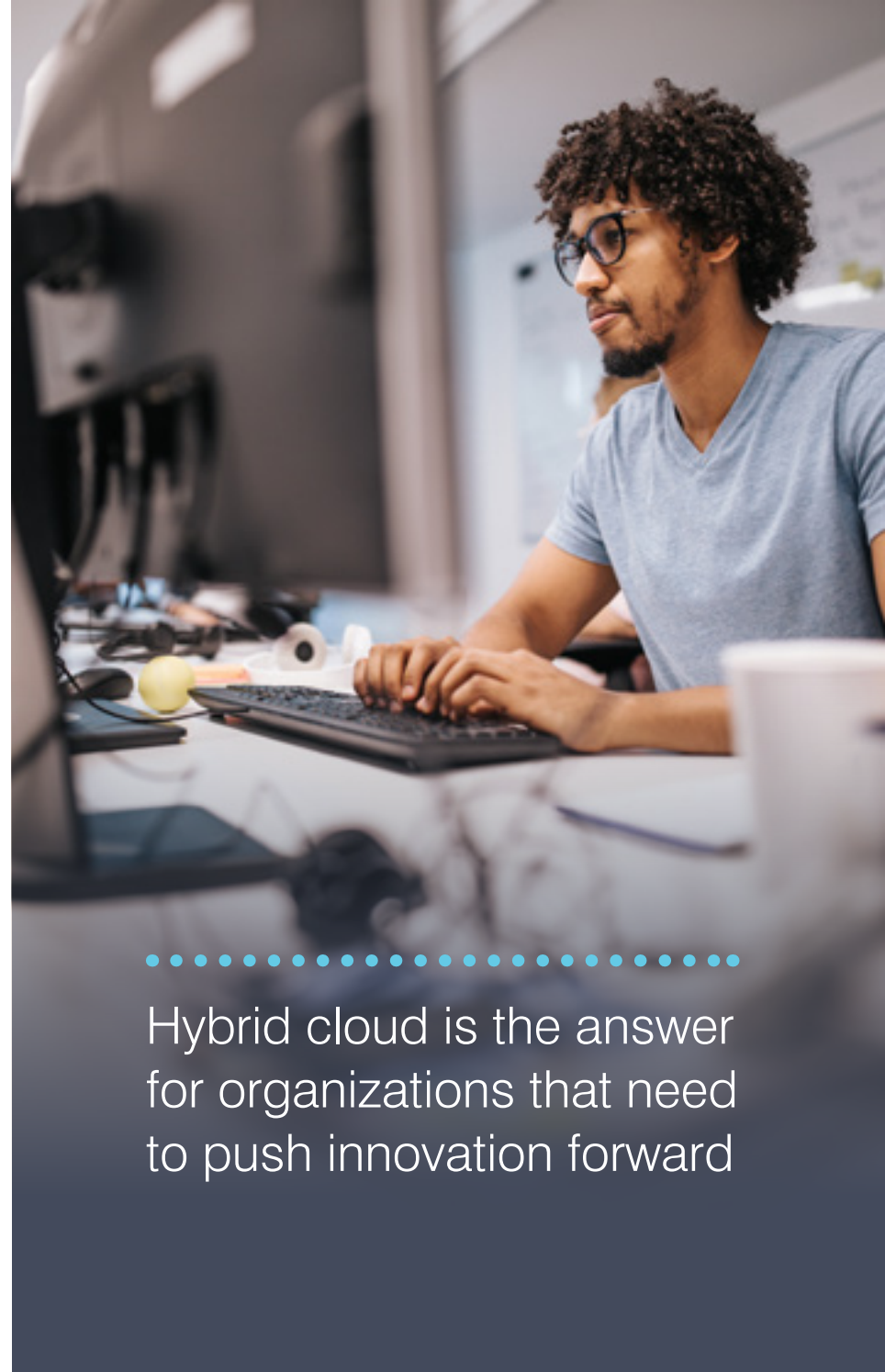
Platform Flexibility Supports Data Analysis

Platform flexibility becomes especially important for data analysis, which can have a dramatic impact on the compute environment. Deriving insight from a sea of data in a practical time frame requires significant compute infrastructure. For example, waiting a week to run an analysis on 100 virtual machines on-premises isn't practical. But running the same workload in hours on 1,000 compute nodes in the cloud is something that businesses can benefit from.

The ability to move compute to the cloud is essential for rapid analysis and is one of the key drivers of hybrid cloud.

As organizations go deeper into AI and ML, the ability to manage large amounts of data will become even more important. Similarly, businesses can benefit from running a Kubernetes environment anywhere that's needed, including the data center, the cloud, or an edge node on the manufacturing floor, warehouse, or patient room.

Having the flexibility to run workloads in the location that best suits the demands of the business, and the workload is critical to meeting today's business challenges and is the reason why hybrid cloud is the answer for organizations that need to push innovation forward.



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for organizations that need
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NETWORKING

In a few short years, the number of devices connected to the network has exploded and so have the connectivity requirements for these devices.

Today's networks need the flexibility to connect to on-premises applications as well as internet-based PaaS and SaaS applications. The new demands of connecting and monitoring modern, distributed multi-cloud applications can be daunting, as can supporting users and devices through least-privilege access. It's a lot of complexity for operations personnel to get their hands and heads around in such a short period of time.

The challenge is to securely connect everything and ensure the best experience while driving down costs. It's a huge challenge for everyone. Operations teams need the flexibility to support integration across different technologies because there isn't a single technology to organize this level of connectivity.

Networking enables flexibility and agility while managing risk.

The network is the backbone of Modern Operations. Instead of connecting network to network, networking connects people and endpoints to applications. A modern network must be agile and scalable from a cost and business standpoint, enabling fast innovation and growth.

An effective networking strategy in today's hyper-connected world must be:

- Multicloud-enabled and software-defined
- Automated and API-driven to enable collaboration and rapid changes
- Secured from end-to-end, including Identity-based access controls and complete visibility for continuous monitoring



Networking must work across all domains.

The modern network is now defined by software and must work across domains such as wide area networks, software-defined campuses, the on-premises data center, and the cloud.

Networking supports zero trust.

A software-defined network architecture supports the ability to integrate networks across the enterprise to enable zero trust security. It also enables organizations to base access control on individual identities — security that follows the user wherever they go — rather than fixed network constructs such as IP addresses and subnets.

Networking supports automation for security, integrations, and compliance.

The only way to manage the complexity of the modern environment is through automation, which can automate integrations through APIs and centralized network controllers. A modern network isn't a one-vendor solution. In a multi-vendor environment, it's important to ensure that everything integrates well.

Networking supports continuous visibility.

Automated, centralized network management platforms provide continuous monitoring and visibility into network security, health, and performance, to help operations teams deliver the best user experience possible.

Networking supports a consistent security posture.

Automation helps organizations achieve a standardized, consistent security posture from the core to the edge across all network domains.



PIPELINES AND AUTOMATION

While operations teams are experts at optimizing cost and performance in the traditional data center, it's not always obvious how to manage infrastructure as code.

Automated pipelines help manage complexity and enable innovation.

In the Modern Operations environment, the work gets done through automation and pipelines. Similar to the DevOps world, where pipelines automate the deployment of application code into active environments, operations pipelines automate the process of defining, deploying, and managing infrastructure as code quickly, securely, and at a reasonable cost.

Developers have learned to lean on infrastructure as code for good reason: it saves them significant time and ensures that they spend their time on software development, not on infrastructure. From the developer's perspective, infrastructure is always on and available

Automated pipelines give organizations new opportunities to change the way they do things or recreate or restructure an environment very quickly.

Organizations looking to make rapid, regular updates to applications to better address end user needs and functionality often look to the cloud to provide the flexibility they need to manage unpredictable workloads. Automated pipelines help facilitate that by deploying infrastructure as code to a public cloud provider.

Automation ensures consistency and accuracy.

Automation eliminates the opportunity for a person to make a mistake that could result in performance degradation, security vulnerabilities, or other issues. Automation also documents compliance and configuration settings, providing a clear picture of how things were deployed.



Automation helps to reinforce your security posture.

Consistency across environments extends to consistency in security. Configurations and security requirements can be implemented in different ways in different IT environments. Data center tools differ from public cloud tools. Automation allows a consistent deployment across tools to ensure the proper security posture.

Automated pipelines help manage compliance.

Manual provisioning and maintenance of infrastructure as code can lead to costly oversizing of servers as well as a lack of adherence to internal IT standards or external regulations. Automated pipelines ensure that standards are met, and best practices followed.

Automated pipelines enable cloud-like functionality across cloud and on- premises.

Managing infrastructure as code through pipelines and automation enables operations teams to work across the entire IT estate — on-premises and in the cloud — using the same or similar tools and processes, bringing the agility of the cloud to the data center.

For instance, pipelines and automation give operations teams the flexibility to rapidly redeploy code to handle a performance issue, experiment with new ideas, and quickly change and test infrastructure before putting them into production.

Pipelines and automation can help operations teams make simple changes, such as updating monitoring agents on a small portion of your servers to see if they work. If it works, teams can confidently deploy the agent across more servers. If not, the impact is minimal, especially because you can quickly restore the original configuration.

Flexibility to Move Workloads

It also gives operations teams the flexibility to deploy infrastructure and workloads wherever they want. If your workloads are built with mobility in mind, teams can potentially move a workload from one cloud provider to another to test cost savings or improve service, or move a workload back to your data center if it makes sense to do so.

Automated Promotion to Production

Pipelines enable quick promotion of infrastructure from development through production, with “gates” along the way to inspect code for compliance with internal metrics.

Automation Outside of Pipelines

While pipelines provide structure for automation, there are plenty of other opportunities to automate repetitive processes that live outside the pipelines. Generic automation ensures that established, validated processes are repeat- able at scale to ensure accurate adherence to standards. If you need to update network policies on 1,000 switches, automation ensures consistency across the board.

Automated Remediation

Using the closed loop incident process (CLIP), alerts can be automatically remediated. CLIP can be integrated with your IT Service Management system to automatically open and close an incident ticket, which can dramatically reduce the number of tickets that require human intervention.

Automated Patching, Agents, and Maintenance

Operational automation can also automate patching, deploying agents to enable features like a security dashboard to monitor compliance, and “Day Two” operations such as maintenance, monitoring, upgrade/ downgrade, and system optimization. You can even automate role-based access control to assign least privilege access permissions to help ensure security consistency across the enterprise.

Automated Identities

Provisioning identities with the correct access to applications, data, and physical spaces can also be automated, including automating the turning off of credentials for people who leave the organization.

Automated Passwords and Keys

Passwords need to be rotated. Certificates need to be updated. Encryption keys expire. A lot of headaches can be avoided by automating these processes, too.



OBSERVABILITY

While pipelines and automation help manage complexity, observability monitors and gathers information about the complexity to help operations teams make better, faster decisions to help ensure business continuity.

Automate Insight

A microservices architecture is quite complex. With multiple databases, networks, and applications working together to run the business, operations teams must gather and analyze data from multiple logs, feedback from traces and agents, and data from devices and other endpoints to monitor application performance. In this environment, there's simply too much data to gather and analyze manually.

Modern observability aggregates operational data to gain insight into what's impacting the environment, what can be improved as the environment matures and evolves, and identifies activity that may be trending towards a performance issue.

For example, by analyzing network patterns, operations teams can find underutilized servers that can be leveraged for more work or discover unusually large database calls that indicate a query needs to be optimized.

Ensure an Excellent User Experience

Modern observability helps operations teams understand what the end user is experiencing. It gives operations teams the ability to quickly identify and remediate performance gaps before they impact the user experience and well before system performance erodes to the point of affecting the business.

Automate Fault Detection and Remediation

Modern observability reduces the mean time to detection (MTTD) for performance issues by automating error and fault detection. Observability data can be used as input for CLIP-based automated remediation.



DATA AVAILABILITY AND PROTECTION

With much of today's data coming from sources outside the data center, making it available to the right people at the right time to do the right work is essential, along with having strategies in place to ensure data is free from accidental or deliberate corruption, deletion, or loss.

Balance Availability with Protection

Data availability and protection is a balancing act. You need enough data access to keep the business running but not too much protection to make access difficult or time-consuming. The challenge is to strike the right balance between availability and protection to balance business risk with desired outcomes.

Data Availability Fuels Innovation

Modern data availability fuels innovation by getting the right data to the right people in the right format. For example, a next-generation marketing plan might require anonymized data combined with external data. Modern data availability can bring everything together quickly. Or, to determine risk for a bank, an analyst might need to build a machine learning (ML) model to do analytics against all account holders. On-premises, it could take weeks to build the ML model and thousands of hours to do the analysis. Instead, you can make that data available in the cloud, build the ML model in hours and get the results in a reasonable time frame.

- With networks and infrastructure now being
- defined by software, it's critical to ensure
- your infrastructure and network code
- are backed up and protected.



Data Protection to Build Resilience

Data protection enables resilience by ensuring that data is protected from accidental or deliberate corruption, deletion, or loss. Data protection helps your organization stay in business, because today, the data is the business. Loss of data has a cascading impact. If a critical database is down — for example, in a ransomware attack — your organization may end up losing revenue. Or if data such as a bank balance isn't readily available to customers, it may impact the brand. Data protection encompasses traditional capabilities such as backup and recovery but also includes things like resilience, so if you lose a capability or service, your organization is able to recover quickly.

Modern Data Availability and Protection Requires Modern Tools and Processes

Traditional tools for data protection and availability weren't designed for highly distributed, cloud-like environments with the “always on” nature of the internet. For example, if you don't have a way to quickly restart your infrastructure, your organization may face a lot of pain.

Or if your data is deleted or corrupted by ransomware, you need a way to restore the data so you can restore the business.

With networks and infrastructure now being defined by software, it's critical to ensure your infrastructure and network code are backed up and protected.

To mitigate risk in the modern environment, operations teams need to adopt and use modern tools and processes to ensure that every piece of data is available as needed and protected against loss or corruption. For example, if your infrastructure is stored in a repository and that repository becomes unavailable, what do you do? The good news is that there are good tools that work very well in the modern environment, but operations teams need a way to make the transition.



SECURITY

When it comes to the safety of your technology assets and business data, there's a lot to consider.

- Threats are continuously evolving.
- Oftentimes, security controls are overlooked to speed up the innovation process and get a competitive advantage.
- The collective journey to the cloud has moved our applications and data into a borderless world where it's difficult for security teams to identify, protect, and respond to incidents.

Unfortunately, what many organizations are doing to manage today's threats and risk isn't working.

For example, tools are important, but they aren't the answer. Some tools don't get implemented, many aren't optimized, and most work in a disjointed fashion that creates gaps. More tools mean more complexity, and complexity creates fertile ground for hackers.

Many organizations are leaning on compliance as their means of data security. The sad reality is many organizations that excel in compliance are suffering significant breaches.

Depending exclusively on conventional strategies such as focusing on tools and maintaining compliance will have you fall short of the mark.

Security touches all aspects of Modern Operations and software development. So, making security an inherent part of the software development process is a huge asset. That's because, in a Modern Operations environment, security controls are built-in, not bolted on after the fact.

When organizations build applications and capabilities in a way that inherits the security controls already in place, they can actually accelerate their time to market.

Security as a Business Enabler

Rather than being an obstacle to getting innovation out the door, cybersecurity should be a business enabler.

By skillfully calibrating security investments, organizations can both mitigate business risk and foster innovation. In this way, cybersecurity becomes a catalyst for business continuity, customer trust, and growth.

To be a business enabler, cybersecurity needs to balance an organization's risk tolerance and business strategies with the five major cybersecurity threats:

- 1 Phishing and social engineering**
- 2 Business email compromise (BEC) and corporate account takeover (CATO)**
- 3 Ransom attacks**
- 4 Vulnerabilities in cloud infrastructure, applications and software, endpoints, and networks**
- 5 Insider threats**

With this approach, compliance, security, and safety are assured.





Systems Integration Is the Key to Cybersecurity Success

Balancing risk with business strategies requires a level of systems integration that ensures interoperability among security tools and systems. **By ensuring that security capabilities are integrated, organizations can realize the full value of their existing cybersecurity investments.**

Gaps exist where systems don't interact. For example, if endpoint security doesn't interact with network detection and response tools, there's a gap. If the latter doesn't link to the user identity platform, there's another gap, and so on.

Improved cybersecurity is more about integrating what's already installed and less about adding more tools.

Most organizations understand they have security gaps. But the prescription for closing them isn't always clear. An outside cybersecurity vendor that doesn't understand your operational environment isn't in a good position to recommend a successful solution. What businesses really need is a partner that understands their environment, risk tolerance, and business goals to provide actionable, prescriptive advice.

WORKING WITH EVOLVING SOLUTIONS

Evolving Solutions helps organizations adapt to new disciplines and develop their operational maturity.

Since our founding, Evolving Solutions has been helping clients make the full transition to Modern Operations. Our insight into transformation and Modern Operations comes from firsthand experience. We've witnessed the value of breaking silos that development teams and operations have traditionally had in place.

We are senior operations experts who understand the challenges that modern data centers face.

Our experts have managed operational complexity in IT environments, so we've been in your shoes. We've worked across industries and organizations of all sizes to help companies get the full value of their transformation investments.

We understand the internal challenges that clients face in identifying and implementing successful solutions.

We help operations leaders advocate for a Modern Operations environment to business leaders. We also factor in people and processes so that technology solutions fit your culture and ways of working.

With our holistic view of Modern Operations, we act as a bridge between groups — such as network and security — to help clients reach across silos to get the full value of their investments in transformation.

We take the time to understand what you want to accomplish.

As experienced operations professionals, we can propose creative solutions to help organizations improve business outcomes through technology.

Evolving Solutions takes an action-driven approach to helping organizations incrementally move toward Modern Operations to help realize business outcomes.

We're focused on helping organizations develop a roadmap and strategy for moving toward Modern Operations. We look for low-hanging fruit that we can help you be successful with to help organizations get quick wins at the beginning of their journey. We help clients leverage these quick wins into the next project that can best help organizations get the most from their technology in a way that fits their IT and business strategies.

- Our promise is “Done Right,
- Every Time,” which is why
- organizations put their trust
- in Evolving Solutions.

LET'S TALK

To learn more about how to create a roadmap to Modern Operations contact Evolving Solutions today.

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