

Five Essentials of Modern IT Infrastructure Management

The background of the slide is a digital-themed image of a server room. It features rows of server racks with glowing blue and purple lights. Overlaid on this are streams of binary code (0s and 1s) in various colors, creating a sense of data flow and connectivity.

The Hybrid Nature of IT Infrastructures

For businesses operating in today's digital economy, there's a premium on delivering optimized user experiences—all the time and every time—while wringing maximum agility, performance and value from the infrastructure. To meet these demands, the digital infrastructures that businesses rely on continue to grow increasingly dynamic and elastic, diverse and dispersed.

Enterprises, government agencies, and MSPs commonly rely on multiple public clouds, picking the right services that are best aligned with each specific use case and objective. Application workloads continue to move to containers and microservices. In some cases, containerized workloads are starting to be leveraged in place of virtualized workloads. IT teams are gradually adopting serverless computing approaches. For organizations running their internal private clouds and on-premises business services, the use of hyper-converged infrastructures continues to grow.

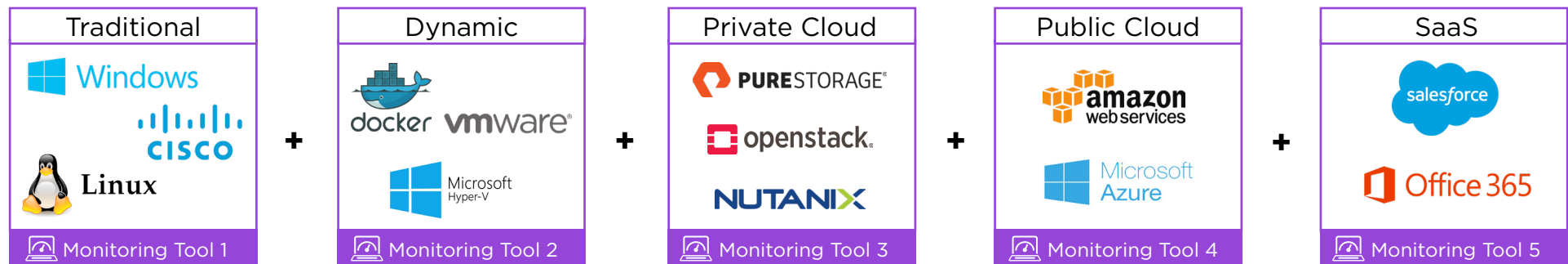
With all these various trends emerging, change continues to get more rapid, making predictions about the future difficult. The only thing that does seem certain is that environments will only get more hybrid in nature moving forward.

By 2020, **90 percent** of organizations will adopt hybrid infrastructure management.¹

-Gartner

More than **80 percent** of companies use a multi-cloud strategy, typically comprised of a hybrid cloud model which relies on public and private clouds.²

-CIO



The Challenge: Lacking Visibility Across Hybrid Environments

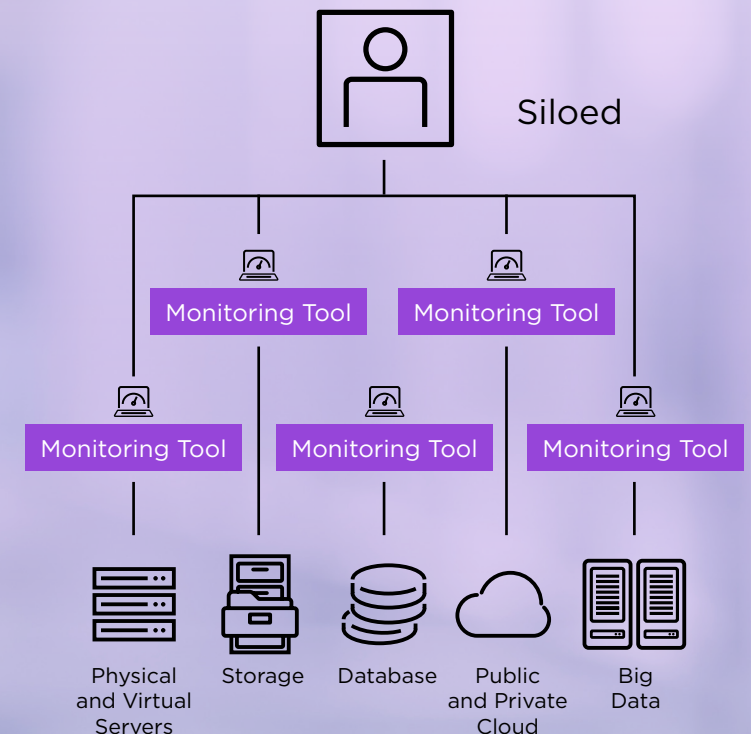
For the IT teams responsible for the quality of the user experience, today's hybrid environments pose a new set of challenges. When a customer interacts with the business' mobile app, for example, that interaction may now be contingent upon the performance and integration of a wide range of infrastructures, including cloud and on-premises, traditional and dynamic. When issues arise, determining what the cause is, where it is and how to fix it continues to get more difficult. Further, this lack of visibility means IT teams can only react to issues after customers' experience is degraded.

In the digital economy, businesses need to be able to proactively track performance, and gain the insights required to spot troubling trends and address issues, before the customer ever notices there's a problem.

IT teams have been saddled with running multiple monitoring tools because no single tool had been implemented that could deliver coverage of the entire environment. Because teams are using disparate monitoring technologies, IT staff has to dedicate massive amounts of time and effort to tool configuration and maintenance, and to aggregating data from across systems in order to generate reports. Ultimately, these realities have a number of repercussions:

- The user experience is suboptimal far too often.
- Staff productivity and morale are poor.
- Staff lack a clear understanding of utilization trends, which either means sufficient resources aren't always available when needed or money is wasted on excess infrastructure and cloud resource investments.

Ultimately, these disjointed toolsets significantly inhibit agility. Application rollouts are delayed because of the time it takes to roll out the required monitoring capability. Likewise, the adoption of new technologies takes too much time because a new monitoring tool needs to be procured, configured and deployed.



Key Imperatives for Modern Infrastructures

To manage and optimize their modern digital infrastructures, today's IT teams need to take a new approach. To succeed in meeting their objectives, these teams have to leverage tools that address these requirements:

Dynamic Policy-Based Configuration:

A standard automated approach to monitoring deployments.



Unified Monitoring and Analytics:

An out-of-the-box unified solution that covers the entire IT infrastructure; on-premises platforms, cloud services or a hybrid of both.



Extensibility:

A simplified approach to integration and support for new technologies.



Contextual Intelligence:

Augmented infrastructure monitoring tools with artificial intelligence (AI)-driven analysis capabilities; AIOps.



Automation:

Automated discovery and deployment capabilities that adapt to evolving environments.



Dynamic Policy-Based Configuration

Today's environments are too dynamic to rely on cumbersome configuration efforts. To support agile and DevOps approaches, monitoring needs to be deployed quickly. When teams need to deploy monitoring for a new infrastructure technology or application, the process should be a low-touch, automated and turnkey.

In today's environments, time to monitor is a critical metric for IT teams to track and improve. Through dynamic policy-based configuration, IT teams can make significant gains in reducing time to monitor metrics. By implementing a standardized automated approach to monitoring deployments, IT organizations can better support rapid deployments and improve infrastructure performance.

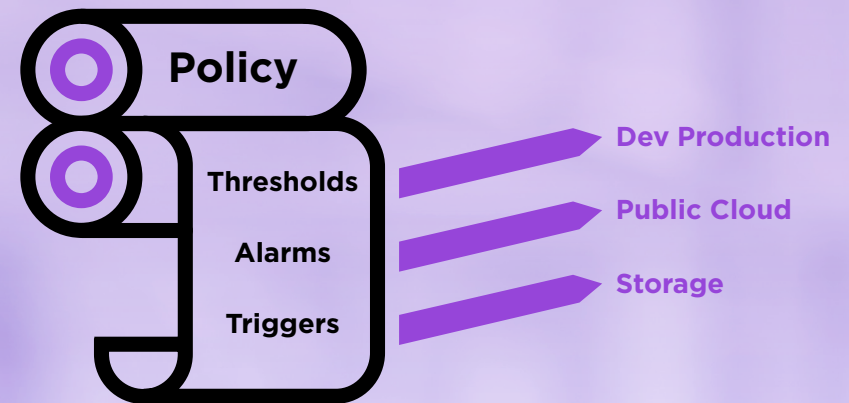
Monitoring tools should provide dynamic discovery capabilities, so as new systems or services come online, they can be automatically detected and have appropriate monitoring configurations applied. These discovery capabilities should have the intelligence to determine the resource and type of technology, no matter the environment. For example, in the cloud, the platform should be able to discover and distinguish between a new Amazon EC2 instance and Amazon RDS, or an Apache server versus Microsoft SQL Server. This approach also reduces technology-specific complexities and enables staff to adopt new technologies faster.

At the same time, tools should offer the ability to consistently enforce controls. Templates should be available that enable both consistency and efficiency in the application of monitoring configurations for similar resources. Tools should provide templates that have been developed based on industry best practices for each specific technology and environment.

These dynamic platforms also need to feature capabilities for intelligent alarm configuration, enabling dynamic baselines and thresholds that help reduce false alarms.

“In today's hybrid cloud and DevOps centric environments, you can no longer take hours to deploy monitoring for your infrastructure. You need a standardized, rapid approach for configuration to boost staff productivity and protect IT Ops.”

-**Torsten Volk**, Managing Research Director - Cloud, Containers, DevOps and AI -Enterprise Management Associates, Inc.



Unified Monitoring and Analytics

IT teams need a single view into their entire environment. Whether they are running traditional infrastructures, containers, hyperconverged infrastructures, multiple clouds or all of the above, they need a unified way to monitor it all. They should be able to get proactive, actionable insights and correlation across various elements.

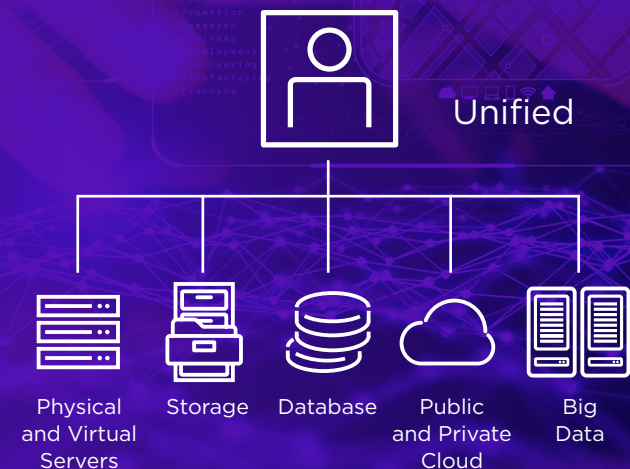
To meet their mandates for providing excellent user experiences, IT teams need a unified solution that delivers out-of-the-box coverage of the entire IT infrastructure, whether the environment is comprised of on-premises platforms, cloud services or a hybrid combination of both. They should also be able to get comprehensive coverage, not only of their environments but of the various data types that are needed, including performance, availability, anomalies and log data.

Monitoring tools should also offer an interface that enables intuitive, flexible capabilities for slicing data in different ways, including by specific applications, infrastructure elements, development and test environments, and more.

With these capabilities, IT organizations can realize a number of benefits. Instead of being relegated to lengthy all-hands triage calls and finger-pointing associated with having different infrastructure or application teams working with their own tools, organizations can boost team productivity and collaboration. In addition, IT teams can speed resolution when issues arise, and gain the predictive insights they need to address potential problems before they have any impact on the user experience.

“Whether an enterprise has a dedicated network operations center (NOC), a cross-domain operations center, or something else, full-stack, hybrid cloud visibility is no longer a secondary requirement. It is essential.”

–**Shamus McGillicuddy**, Senior Analyst Network & Hybrid Infrastructure Management Enterprise Management Associates, Inc.



AI-Driven Contextual Intelligence

As IT environments continue to grow more complex and dynamic, the volumes of monitoring data being generated continue to grow rapidly. Relying on disparate tools and approaches, IT teams are ill-equipped to manage and analyze all the data being generated. Staff members struggle to manually correlate different types of data. For example, they are challenged with correlating log and metric data. They also struggle to correlate infrastructure and non-infrastructure intelligence, such as network or application code errors. In addition, these teams can't effectively correlate business and infrastructure data, which makes it difficult to understand how infrastructure issues affect business users and performance.

To contend with these challenges, IT teams need to augment infrastructure monitoring tools with artificial intelligence (AI)-driven analysis capabilities, also known as AIOps. Through AIOps, tools can gain the power needed to correlate infrastructure data with intelligence from across the organization, including network, application and business intelligence. Leveraging tools with machine learning algorithms and anomaly detection, IT teams can more intelligently track trends to identify when abnormal situations arise, and they can gain predictive insights that fuel enhanced issue prevention and improved resource management.

Gartner estimates that currently, only five percent of businesses have an AIOps platform in place, however in the next two years that number is expected to grow to 25 percent.³

—Gartner

Automation

Today's IT teams are under constant pressure, facing demands to do more with less while at the same time helping to ensure superior service levels. To respond, they must make automation a key pillar of their infrastructure management and monitoring strategy.

As outlined above, automated discovery of new systems, as well as automated deployment of monitoring of these new elements, is vital in order to support today's dynamic infrastructures and DevOps environments. IT teams also need to ensure dashboards and reports can automatically be adapted to evolving environments, and automatically generated and refreshed.

Moving forward, IT teams will also need to leverage capabilities for automated response and remediation workflows. For instance, once a potential bottleneck is spotted by monitoring software, it could trigger a workflow by passing over information to collaboration tools, or trigger a remediation process by connecting to a management or automation tool—for example, a potential utilization bottleneck is identified and a new cloud server (e.g., AWS EC2) is provisioned. As a result, potential disasters can be avoided and IT teams' time saved.

Extensibility

As technological innovation continues to accelerate and requirements continue to evolve, IT teams need to be able to respond with maximum agility and speed. It is critical that monitoring tools effectively support these objectives.

Tools need to support a wide range of technologies and environments, and as new systems are employed, the process of establishing monitoring coverage of these new technologies needs to be fast and easy, whether through APIs or intuitive, wizard-based interfaces. Monitoring tools also need to support easy and efficient integration with other IT operations management tools, including service desk platforms, DevOps management tools, network monitoring platforms and more. This capability is essential to making your operation future-proof in a world that's built to change.

“In the modern, Cloud era, use open not necessarily opensource tools that allow you to manage and integrate with new technologies easily.”

–**David Linthicum**, Chief Cloud Officer, Deloitte Consulting

Introducing DX Unified Infrastructure Management

DX Unified Infrastructure Management (DX UIM) provides a single, analytics-driven solution for proactively and efficiently managing modern, cloud and hybrid IT infrastructures. DX UIM is the only IT monitoring solution that provides intelligent analytics, comprehensive coverage and an open, extensible architecture. By leveraging the solution, your organization can speed mean time to repair, reduce monitoring efforts, accelerate new deployments and improve the end-user experience.

- Out-of-the-box integrations with over 140 technologies provide immediate value
- Policy-based automated configuration is designed for today's DevOps environments
- Open extensible architecture helps you integrate and customize to your unique needs
- Integration with powerful AIOps solution provides contextual intelligence

Unified Hybrid Infrastructure Observability



Scalability for IT Complexity



Unified Hybrid Infrastructure Observability



Intelligent Operations





For more information, visit broadcom.com

1 CIO Drive, "Is multi-cloud the answer? Most companies are using up to five,"

2 Gartner, "Gartner Says a Massive Shift to Hybrid Infrastructure Services Is Underway"

3 Gartner, "How AIOps takes IT companies from reactive to proactive"

4 Benefits realized for a composite organization created for The Total Economic Impact™ Of CA Unified Infrastructure Management, a March 2018 commissioned study conducted by Forrester Consulting on behalf of CA, "The Total Economic Impact of CA Unified Infrastructure Management"

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