Predicts 2023: Observing and Optimizing the Adaptive Organization

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Initiatives: I&O Operations Management

I&O leaders deliver stable services built upon changing technology platforms; however, business conditions are changing as rapidly as technology. This research examines four predictions that illustrate ways to stabilize operations as organizations further adapt to the changing conditions.

Additional Perspectives

- Summary Translation: Predicts 2023: Observing and Optimizing the Adaptive Organization
  (09 December 2022)

Overview

Key Findings

- As the world moves from one unprecedented sequence of events to another, organizations are finding that traditional planning and execution processes are insufficient.
- The default posture for many I&O teams is reactive and with sparse emphasis on automation, leading to costly inefficiencies.
- Health; performance; security and cost data; or telemetry is often not accessible on a timely basis to the people or processes that need it. This inhibits the I&O and application teams' ability to observe and optimize workloads with the necessary granularity.

Recommendations

I&O leaders responsible for infrastructure, operations and cloud management should:

- Prepare for emerging workload hardening and optimization capabilities by creating a unified telemetry collection, management process and life cycle that consistently support multiple producers and consumers with minimal latency.
- Foster greater resilience and reliability in products and support processes by adopting chaos engineering practices and tools.

Strategic Planning Assumptions

- By 2026, organizations performing real-time cost or performance optimization of cloud-based workloads will rise from less than 20% in 2022 to 50%.
- By 2025, 50% of large enterprises will use chaos engineering to extend product MTBF and accelerate teams' MTTR, up from 20% in 2021.
- By 2026, 40% of log telemetry will be processed through a telemetry pipeline product, a rise from less than 10% in 2022.
- By 2024, at least 40% of Digital Experience Monitoring (DEM) will be embedded within a SASE service, up from less than 1% in 2022.

Analysis

What You Need to Know

Since 2020, we have experienced how the passage of time has been altered by the COVID-19 pandemic. Although perspectives may differ as to whether this means acceleration or deceleration, I&O leaders are more likely to see the former as the pace required to maintain operational excellence continues to increase. Business priorities shift in response to changes in economic conditions, international stability and the nature of work.

At the same time, technology continuously advances. If your portfolio is standing still, obsolescence is just around the corner. For I&O leaders, the need to adapt is coming from both above, executive leadership looking for support, and below, the teams looking for guidance and budgetary support to ensure that objectives are met and that obsolescence stays around the corner.

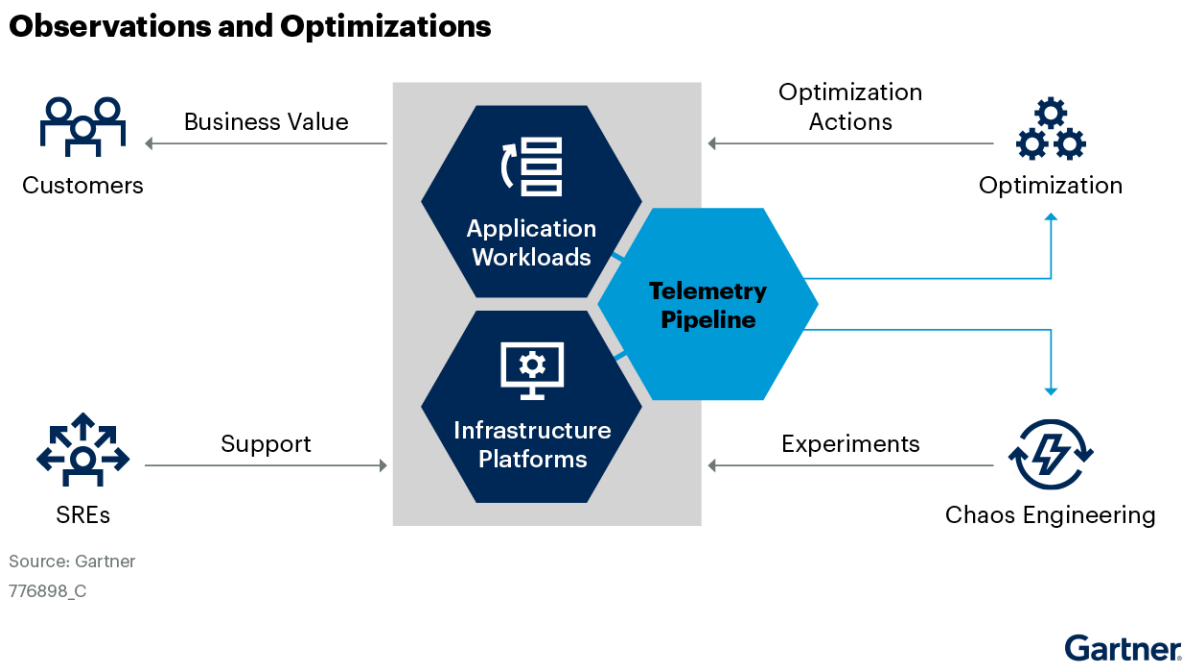
One decision facing I&O leaders is where and when to stay in the driver's seat: when to act as the catalyst for broader organizational change and when to adapt I&O to fit the organization. The predictions that we have explored this year examine different ways to ensure that our applications, infrastructure platforms, service management and operations support remain performant, robust and secure while remaining agile enough to delight customers and executive leadership.

They include:

- Adapting to changes in demand for and cost of resources using objectives-driven constraints and rich telemetry.
- Improving availability and ensuring robust support processes by intentionally exposing workloads to hostile conditions via chaos engineering throughout the product life cycle.
- Centrally and intentionally managing the acquisition; analysis and routing of health; performance; experience; and security telemetry to ensure that accurate measurements and timely observations are consistently propagated to enable automation and self-healing.
- Augmenting health and performance monitoring with security to ensure that the distributed organization is protected against modern threats.

Figure 1 illustrates one possible arrangement.

Figure 1: Observations and Optimizations



Strategic Planning Assumptions

Strategic Planning Assumption: By 2026, organizations performing real-time cost or performance optimization of cloud-based workloads will rise from less than 20% in 2022 to 50%.

Analysis by: Gregg Siegfried

Key Findings:

- Telemetry acquisition and analysis capabilities in many organizations increasingly include the granularity necessary to capture changes in workload behavior, resource requirements and cost in exquisite detail.
- Insufficiently comprehensive automation has been a limiting factor for many organizations, even those using DevOps toolchains based on continuous integration/continuous delivery (CI/CD) or value-stream delivery platforms. Automation and orchestration tools are evolving to better support the scope and change velocity of cloud-native software.
- Cost-based telemetry, objectives and KPIs are often managed separately, perhaps by a FinOps team, and analyzed over longer periods of time than health and performance telemetry. As with other operations' cycle times, these time horizons are shrinking.
- Products have been available that support real-time or near-real-time workload optimization for some time, but these have generally been limited to supporting specific host platforms.

Market Implications:

As application architecture becomes more complex and application platform abstractions move further away from servers, storage and networks, the challenge of optimizing them increases substantially. End-to-end optimization of modern workloads first requires a series of prioritized health, performance and cost constraints that look much like service-level objectives (SLOs). Add to these a set of allowable actions that the operators have authorized, and the result is essentially a control system.

Tools like IBM Turbonomic and Virtana's Virtual Wisdom have long supported performance optimization for on-premises workloads and have been enhanced to factor cost in when workloads are public cloud hosted. They also can be used in both autonomous and approval-based modes. Sedai is an example of a more recent generation of workload optimization tool that supports a smaller set of cloud-native platforms — Kubernetes and FaaS/serverless — but claims to deliver exactly the type of real-time cost and performance optimization that this prediction refers to.

As these solutions continue to evolve, organizations adopting them should be watching for these:

- Broader support for FinOps use cases with both constraints and actions.
- Incorporation of AIOps features or integration with AIOps platforms to respond to failure-related events that affect optimization constraints.
- Integration points being built into cloud and application platforms that support a bring-your-own optimization engine capability with standard telemetry, constraint and action interfaces, allowing workload-specific optimization resources to be provisioned along with the workload itself.

Recommendations:

- Collect and manage cost telemetry from your cloud providers just as you manage health and performance telemetry. You may not act on it as urgently now, but treating those signals with equal importance positions your organization to benefit from real-time cost optimization when the capability becomes available.
- Build trust by enabling autonomous optimization in existing tools today if you are using any of them in an "advisory only" mode.
- Expand automated software quality and performance test suites to include testing of optimization scenarios so you understand the impact optimization like this has on applications.

Related Research:

Is FinOps the Answer to Cloud Cost Governance?

Market Guide for Cloud Management Tooling

Infographic: Gartner's Reference Cloud Operating Model

3 Steps to Improve the Reliability of Large, Complex and Distributed IT Systems by Leveraging SRE Principles

Strategic Planning Assumption: By 2025, 50% of large enterprises will use chaos engineering to extend product MTBF and accelerate teams' MTTR, up from 20% in 2021.

Analysis by: Jim Scheibmeir

Key Findings:

- Although the chaos engineering tools market has been predominantly composed of open-source offerings, many viable commercial products, including those from hyperscalers, have entered the market within the last two years.
- While adoption of chaos engineering is growing, scaling the practice within organizations is still a challenge for I&O leaders to overcome.
- Internal organizational interest in chaos engineering occurs across roles and activities both in and outside of I&O, including software engineering, cloud engineering and architecture, SRE and software quality.

Market Implications:

Chaos engineering is the use of experimental and potentially destructive failure testing or fault injection testing to uncover vulnerabilities and weaknesses within a complex system. The practice of chaos engineering is still nascent among I&O and software engineering teams, but it is gaining traction.

Gartner's 2020 Achieve Business Agility With Automation, Continuous Quality and DevOps Study [1] found that 18% of respondents were currently doing chaos engineering or planning to use the practice. However, Gartner inquiries on chaos engineering increased by an average 31% year over year since September 2020.

Chaos engineering aids in the improvement of team knowledge regarding the behavior of complex systems while also increasing a system's mean time between failure (MTBF). Team knowledge is increased through chaos engineering by identifying areas where system knowledge is siloed, needs to be increased or where confidence is higher than our ability to quickly triage and restore a service.

Run books and the associated triage and remediation knowledge can be validated through chaos engineering experiments. Mature organizations will add chaos engineering into their definition of done or instrument the experiments into their CI/CD pipelines, extending into production environments. The MTBF will likely increase as knowledge, architecture and configuration improvements are identified through the CE practice and prioritized into the team's way of working the product's backlog.

Chaos engineering aids mean time to resolution (MTTR) in the following ways:

- Validates the correctness of monitoring thresholds and alert receipt
- Ensures the alerts are passing meaningful information to their recipients
- Provides opportunities to execute and observe runbooks and automated recovery capabilities
- Discovers single points of failure
- Ensures high-availability architecture is properly configured
- Gives teams opportunities to practice manual triage and recovery

Recommendations:

- Start chaos engineering through gamedays [2] that focus on the intentions of knowledge gained and that promote collaboration and teamwork — including teams and roles outside of I&O.
- Large organizations should set up an enabling team to coach and scale CE while the product teams leverage a supported CE platform.
- Influence teams to share their CE attack plans and artifacts when they have system dependencies that are in common with other products and teams.
- Educate stakeholders, such as product owners, on the importance of continuous resilience and reliability, so they make informed priority decisions between business features and system faults.
- Promote your adoption of chaos engineering in your talent hiring strategy to attract candidates seeking cutting-edge employers.

- Ensure the practice sticks within your organization by adding chaos engineering to the training regimen, job descriptions for I&O employees, performance evaluations and other measures.

Related Research:

Market Guide for Chaos Engineering

Demystifying Chaos Engineering for I&O

Innovation Insight for Chaos Engineering

Strategic Roadmap for Becoming a World-Class Software Engineering Organization

Hype Cycle for Application Security, 2022

Strategic Planning Assumption: By 2026, 40% of log telemetry will be processed through a telemetry pipeline product, up from less than 10% in 2022.

Analysis by: Mrudula Bangera

Key Findings:

- Modern environments generate large volumes of data — sometimes petabytes per day — which makes the ingestion/retention of logs in enterprise log analytics very expensive, especially when at least some of that data is redundant.
- The increasing availability of commercial telemetry pipeline tools acts as a transport layer. Their emergence is a response to I&O's increasing requirement to easily collect, enrich, filter and route log data from many sources before sending it to multiple destinations.
- The demand for log analysis solutions with advanced AI and analytics features is expected to increase as they can make I&O professionals more efficient while troubleshooting and resolving infrastructure and applications issues.
- Operation and support of cloud-based and cloud-native architectures requires effective logging; proactive monitoring and alerts; analysis; and reporting solutions designed for their size and scale.

- Telemetry pipeline products enable organizations to substantially improve cost control by enabling noncritical and compliance-related log data to be stored offline or routed to less-expensive tools.

Market Implications:

Rapid adoption of cloud and hybrid architectures has generally led to infrastructure complexity and exponential growth in telemetry data and particularly that of log data. Many observability solutions are inefficient and costly at scale as their consumption pricing is often centered on data ingestion volumes and data retention periods. In response, organizations are compelled to use various methods to manage increasing log data volumes and their associated costs.

Based on increasing client inquiry, Gartner expects growing adoption of telemetry pipeline products, such as Cribl Stream, Calyptia Core and ObservIQ BindPlane, to implement a data management strategy and reduce infrastructure costs. Doing so lets I&O teams determine which logs need to be aggregated into metrics and which data should be stored for analysis, archived in offline cold storage (e.g., AWS S3 or GCS) for compliance and discarded altogether.

Organizations can expect five primary benefits from telemetry pipelines products:

- Better control of the escalating costs associated with log data
- Ability to ingest data in any format
- Supported integration with existing monitoring and observability tools
- More efficient and cost-effective telemetry collection and storage
- Advanced AI/ML to make operations more efficient through automated data analysis

Recommendations:

- Adopt telemetry pipeline products that support both operational and security use cases across the enterprise. Invest in a telemetry pipeline product that allows you to collect data once, transform and filter it and direct it to any tools that fits your needs.

- Invest in telemetry pipeline tools that can manage long-term data retention requirements in a cost-effective way and also support recovery of data for analysis and forensic purposes.
- Develop observability strategies that can scale to meet the ever-growing volume of telemetry data and adopt structured logging mechanisms.

Related Research:

Cool Vendors in Monitoring and Observability — Modernize Legacy, Prepare for Tomorrow

Guidance Framework for Deploying Centralized Log Monitoring

Strategic Planning Assumption: By 2024, at least 40% of DEM capabilities will be embedded within a SASE service, up from less than 1% in 2022.

Analysis by: Bjarne Munch

Key Findings:

- Adoption of remote work and work from home is driving increased adoption of DEM solutions.
- Convergence of software-defined WAN (SD-WAN) and cloud-based network security into Secure Access Service Edge (SASE) is forecast to grow by 36% by 2025 to a $15 billion market.
- Convergence and consolidation of multiple different endpoint agents and operational interfaces are driven by a need for operational simplification.

Market Implications:

Demand for DEM is growing due to use of work from home and other remote work scenarios, and I&O leaders are establishing solutions for ongoing hybrid workplace environments. This is leading to a growth forecast in user spending on DEM solutions of 15.1% through 2025 (see Market Opportunity Map: IT Operations Management, Worldwide). Due to this, Gartner expects that by 2026 at least 60% of I&O leaders will use DEM to measure application, services and endpoint performance from the user's viewpoint, up from less than 20% in 2021 (see Market Guide for Digital Experience Monitoring).

However, this permanent use of hybrid work is also leading to needs for improved security, such as replacing traditional VPN with zero trust network access (ZTNA), and in some cases deployment of SD-WAN for more critical tasks and applications. The need to better secure remote connectivity and application access is a key driver for convergence of security and SD-WAN into SASE, and a key reason as to why CIOs rate SASE as one of the top-most emerging technologies in the 2022 CIO survey (see 2022 Strategic Roadmap for SASE Convergence).

Gartner forecasts that the SASE market will grow by 36% through 2025, and by 2025 65% of enterprises will have consolidated individual SASE components into one or two explicitly partnered SASE vendors, up from 15% in 2021.

A key reason why enterprises are interested in SASE is because the convergence of multiple different security and network domains consolidate back-end infrastructure and operational interfaces, and because it consolidates multiple individual user device agents into one. Given this consolidation, we are now seeing vendors such as Palo Alto and Versa incorporating DEM functionality. Gartner expects this trend to continue until the majority of SASE providers will eventually incorporate DEM functionality (see 2022 Strategic Roadmap for SASE Convergence).

Because SASE is a high-priority strategy for many enterprises, the inherent DEM functionality will become available to I&O leaders more aggressively than it otherwise would have. The DEM functionality embedded within these SASE services is likely to be less feature rich, at least initially, than traditional vendors, but still good enough for many enterprises. For this reason, we expect widespread adoption of SASE embedded DEM, and it is likely that SASE vendors will acquire existing DEM-focused vendors.

Recommendations:

- Operations leaders who are seeking DEM solutions should also include SASE vendors in their evaluations.
- Because the network and security team may approach their SASE strategy as a multiyear roadmap, operations leaders need to evaluate if the specific timing is suitable.

- The SASE strategy may be either a single vendor or dual vendor strategy. In case of the latter, operational leaders should evaluate the support of DEM functionality from both vendors in a dual vendor strategy, because both SD-WAN and Secure Service Edge (SSE) solutions may incorporate DEM functionality that may be good enough to meet needs.

Related Research:

Market Guide for Digital Experience Monitoring

2022 Strategic Roadmap for SASE Convergence

Market Opportunity Map: IT Operations Management, Worldwide

A Look Back

In response to your requests, we are taking a look back at some key predictions from previous years. We have intentionally selected predictions from opposite ends of the scale — one where we were wholly or largely on target, as well as one we missed.

On Target: 2018 Prediction — By 2022, 40% of large enterprises will use artificial intelligence for IT operations (AIOps) to support and partially replace IT operations management (ITOM) activities, which is an increase from 5% in 2018.

Analysis by: Matt Crossley

2016 saw the emergence of AI as an essential component of ITOM in a bid to support accelerating digital transformation. The subsequent growth in AIOps deployment has been driven by factors such as:

- The substantial increase in volume, complexity and velocity of telemetry delivered by monitoring tools
- A desire to reposition IT Operations from a reactive to a proactive endeavor
- A need to maintain business observability over increasingly complex distributed applications

This demand for AIOps has been well-received and supported by vendors from both ITSM and ITOM technologies, leading to the emergence of multiple subcategories within the AIOPs market. AIOps features are now included by all major vendors within infrastructure monitoring, network monitoring, application performance monitoring, DEM and observability. Dedicated AIOps Platforms are used for cross-domain event correlation and accelerated incident remediation use cases.

In addition to these, some organizations with more strategic approaches to AI are leveraging in-house data scientists to deliver their own custom-made AIOps solutions using domain-agnostic data analytics tools.

AIOps is established as one of the main drivers of the ITOM performance analysis software market and is discussed in 40% of all inquiries with Gartner clients on this topic.

Missed: 2018 Prediction — By 2023, 40% of DevOps teams will augment application and infrastructure monitoring tools with AIOps platform capabilities.

Analysis By: Matt Crossley

The adoption of AIOps has undoubtedly expanded across the ITOM technology landscape encompassing multiple personas/teams outside traditional IT Operations, including DevOps. However, this growth is largely being driven by the implementation of AIOps features within existing infrastructure and application monitoring tools rather than the adoption of dedicated AIOps platforms. APM vendors, for example, have rushed to add AIOps features, with notable use cases, including dependency mapping, anomaly detection and root cause analysis.

The implementation of full-scale AIOps platforms delivering cross-domain data ingestion, event correlation and automated remediation are often hindered by intangible value propositions and a lack of understanding of the use cases and benefits. That said, while the adoption of AIOps platforms has not met expectations, it is growing rapidly as organizations learn to avoid the hype and benefit from incremental, fast time-to-value implementations. Increasing convergence and demand means that AIOps platforms will likely continue to be a focus area for Gartner Inquiry and Research.

Related Research:

Market Guide for AIOps Platforms

Market Share Analysis: ITOM, Health and Performance Analysis Software, Worldwide, 2021

Market Share: IT Operations Management Software, Worldwide, 2021

Evidence

[1] The **2020 Gartner Achieve Business Agility With Automation, Continuous Quality and DevOps Study** was conducted online from June through August 2020 among 205 respondents working for service providers, cloud providers and end-user organizations in North America and Western Europe that have deployed or are using DevOps. Qualified organizations had at least $500 million in annual revenue and were required to primarily operate in banking and financial services, government, insurance, healthcare providers and retail industries. Respondents were required to work in their organization's IT function, have a job title less senior than C-level and be two or more layers away from the most senior executive in their organization. A respondent's role had to be primarily focused on application development, infrastructure and operations, or business intelligence and information management. In these focus areas, they were also required to perform relevant roles and/or activities.

[2] How to Run a GameDay Using Gremlin, Gremlin.

Recommended by the Authors

Some documents may not be available as part of your current Gartner subscription.

7 Steps to Start and Evolve an SRE Practice

Market Guide for Cloud Management Tooling

Solution Path for Modern Infrastructure and Application Monitoring