

**OBSERVATIONS
FROM GARTNER**
THE INFRASTRUCTURE,
OPERATIONS AND CLOUD
STRATEGIES SUMMIT
DECEMBER 9-12, 2019

**GLOBAL
TECHNOLOGY
SOLUTIONS
GROUP**



GTSG LISTENS TO GARTNER

GTSG listens closely to what Gartner has to say. Why?

Our firm has over 100 excellent consultants, architects, subject matter experts and project managers deeply involved in mission critical client projects over durations ranging from weeks to years. By contrast, each Gartner analysts has perhaps 1,000 interactions with end user organizations per year. These interactions are then synthesized, with best practices (and emerging best practices) crystallized into research which represents the best thinking of a broad range of analysts over the full range of industry segments.

At GTSG, we regularly survey dozens of these analysts. We benefit from their unparalleled insight; our clients benefit from both the broad market scan, and the knowledge that GTSG's methods are consistent with Gartner practices and solution paths.

TRACKS AND EMPHASIS

Over 3,200 attendees chose from over 270 sessions across eight tracks, covering cloud, hybrid, edge, operations management, asset management, the evolution of I&O, skills and culture, and emerging technologies. Last year's rebranding of the event from

"Data Center, Infrastructure and Operations" to "Infrastructure, Operations and Cloud Strategies" opened both the expo floor and the content to the transformative opportunities facing infrastructure & operations leaders today.

KEYNOTE: I&O 2025 — REIMAGINE, REVITALIZE, REENERGIZE

“The pace of change has never been this fast, and yet in the future it will never be this slow again.”

—Justin Trudeau

I&O leaders will be known by the innovation they deliver, not the infrastructure they manage.

A “recent enough” Gartner survey of boards of directors found that 67% agree that digital and technology disruption is the #1 priority... “more important than regulatory control... staff... growth” (as reported by conference chair Dave Cappuccio).

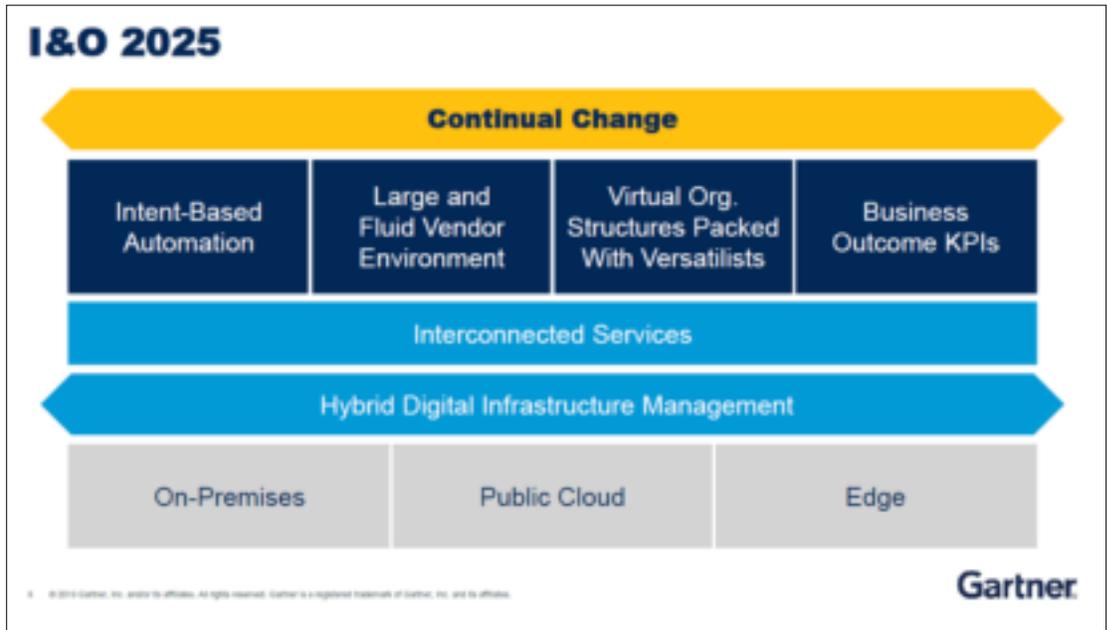
The mission of I&O is to

- Reimagine the Future of I&O itself
- Revitalize Infrastructure
- Reenergize People

Our notes and observations:

- **The 2019 keynote built on the urgency introduced in 2018.** “Reimagine, Revitalize and Reenergize” tells us that the future of I&O depends on changing its role: from “keeping the lights on” to enabling and delivering innovation- all while dealing with day to day operations and technical debt.
- **Infrastructure Led Disruption** means not just doing things better but helping our business and applications partners to drive market disruption at the speed our customers demand. This is the opportunity: not only for I&O to survive but to help disrupt – bringing new capability and partnering with users for the good of the customer and the organization.

RE-IMAGINING THE ROAD AHEAD



“In 2025, the question of where your data center is will be meaningless.”

“Automation is to the modern infrastructure as blood is to the body.”
—Dennis Smith

Workload location: Gartner expects the on-premises share of workload to drop from 80% to 30% between 2019 and 2025; the public cloud to grow from 19% to 40%, and for the edge to climb from 1% to 30%.

Technologies: quantum computing, biometrics, virtual reality, augmented reality, video analytics, orchestration, AI/ML, robotics and blockchain are some of the technologies expected to be mainstream- if not legacy - by 2025.

Dennis defines **Business Service Automation** as the tethering of underlying automation operations with efficient business processes, and states that I&O teams progressing to business service automation will have triple the customer satisfaction of those that do not.

Organizational implications are essential. Today, firms are still siloed with an emphasis on specialists. In 2025, Dennis foresees a heavy use of versatilists and roles based on context, with new job titles and non-traditional talent pools.

All of the change around us organizes around two guiding principles: **quality of services** and **customer intimacy**.

REVITALIZE YOUR INFRASTRUCTURE

Presented by Julia Palmer: Gartner research shows top goals for IT I&O:

- **45%** improve maturity across people, process, technology and governance;
- **44%** improve quality (e.g., SLAs)
- **38%** increase agility

...with the top challenge (for 49% of respondents) being the management of technical debt.

Yes, Julia states, these are potentially contradictory objectives. Yet for I&O leaders now it is “and” rather than “or”

- Modernize **and** innovate
- Reduce technical debt **and** disrupt the status quo
- The present **and** future state
- Stability **and** change
- Analyze **and** execute

Julia utilized the inspiring story of Charity Water, who clearly think of themselves as a tech company. They utilize remote sensing devices to connect individual wells to a cloud-enabled management system for preventive action. With 35,000 projects in 27 developing countries, we can see the difference in expense between sending an individual to inspect a well, versus with a single IoT device which costs \$100 and lasts for 10 years.

RE-ENERGIZE YOUR PEOPLE

Roger Williams provides a powerful call to action, exhorting the audience to look inward to re-energize our people, our teams and ourselves.

Today, about one-third of open I&O leader positions are currently filled from outside of I&O, and Gartner expects that by 2025, 65% will be filled by people that have no I&O experience. While CIOs are eager for I&O leaders to reinvent themselves, they will sacrifice experience to get the benefits of digital transformation. (They would much rather have both.)

Roger emphasized “change agent,” “systems thinker,” and “emotionally intelligent” as those competencies most essential to the success of the I&O leader over the next five years.

“Are we ready to make I&O famous for innovation?”

—Roger Williams

The team: According to a 2018 survey, fully half of senior I&O leaders wanted more staff to become versatilists, yet nearly $\frac{3}{4}$ of midlevel managers and staff felt that specialists were rewarded over versatilists.

The advice is to stop talking about career maps, but rather to move toward “compasses” pointing folks in the right direction. We should be preparing staff to transition toward non-traditional jobs. People need to be engaged, to be given options, and support in transition.

ON CLOUD STRATEGY & PRACTICE

David Smith, who leads the cloud research community, notes that most organizations do not have a formal cloud strategy, although he believes that by 2022, 70% of organizations will come around.

AVOIDING THE TOP MISTAKES IN YOUR ORGANIZATION'S CLOUD STRATEGY

Of these “ten biggest mistakes,” comments on a number:

- **Assuming it's an IT (only) strategy, not involving business.** The “dead giveaway”: when people call and ask “I did my cloud strategy; now how do I sell it to the business?” It's the wrong question. Last year, only 1/4 of respondents said that their cloud strategy included business of functional representatives of business.
- **Not having an exit strategy:** while reports of cloud repatriation seem to be exaggerated, the exit strategy exercise requires the basic hygiene of thinking through contingency plans. David advises that we look beyond contracts, T&C and SLAs and focus on the broader issues of portability and lock-in.
- **Combining a cloud strategy with a cloud adoption/migration/implementation, or equating a cloud strategy with either** “We're moving everything to the cloud,” or “Our cloud strategy is our data center strategy.”
- **Our strategy is by executive mandate:** This still happens a great deal, many still believe “we'll always save money by going to the cloud. Analyst Bob Gill gave us a phrase a few years ago that still fits:
 - The CEO thinks everything's in the cloud
 - The CIO thinks everything's well on its way
 - Everyone is thinking “do they understand this isn't so simple?”
- “We're a <”insert vendor name here”> shop so that's our cloud strategy” or “We need a **single vendor cloud strategy.**” Your use of cloud services will become increasingly varied and diverse, and you will need to establish a cloud strategy that accommodates cloud, multi-cloud, and non-cloud.
- **“We are ‘cloud-first’ and that is our strategy.”** This one brought laughter from the cloud. What it's supposed to mean is that when someone is asking for an investment, the default place to build or buy is the public cloud unless there's a good reason not to do so. It's a balancing act: “too hard” to justify the exception, then it's cloud only; “too easy,” then you don't have a policy. Indeed, “Cloud Smart” means what “cloud first” was supposed to mean.

From 2016 to 2023 the number of small-to-midsize data centers are projected to decline 10% while the number of large and enterprise data centers will increase comparably.

Indeed, in a separate session, Henrique Cecci presented data suggesting that the number of small and midsize data centers would decline in the range of 10% from 2016 to 2023, but that the number of enterprise and large data center centers would increase in roughly the same proportion.

THE CLOUD STRATEGY COOKBOOK

**The best time to build
a cloud strategy is ten
years ago, but the second
best time is today.**

—David Smith, Gartner

David defines the cloud strategy as “a concise point of view of the role of cloud in the organization.” It is to be short (10 to 20 pages); a “living document”; broad (i.e., covers all cloud styles, IaaS, PaaS and SaaS and ...), principles-oriented, and a group effort which incorporates the stakeholders who will live under its governance.

David provided an outline and then addressed some of the issues which become the “meat and potatoes” of the strategy – such as:

- **Workload by workload assessment**, which David states is non-negotiable (and GTSG agrees)
- **Potential guiding principles** such as “cloud first, “buy before build” (SaaS first in cloud terms); and best-of-breed
- **The meaning of multi-cloud and cloud native** to the organization
- **Security principles**
- **Lift and shift** as last resort
- **Vendor considerations and exit strategy**
- **The “when and why” you’ll move** based on good reasons. In the end, you’re asking for investment dollars from the business to provide a benefit.

In closing, David recommends:

- Following a cookbook approach to building a cloud strategy (GTSG embraces a similar approach with our clients)
- Establishment of a cloud strategy council with key members from across the enterprise, including business units; and
- Separating cloud strategy from the implementation plan: cloud strategy is not the same as data center strategy or implementation/adoption/migration plans. David’s surveys tell him that only 13% of organizations have such a plan.

If you haven’t yet, build a “living” cloud strategy document. It’s never too late—and GTSG is here to help.

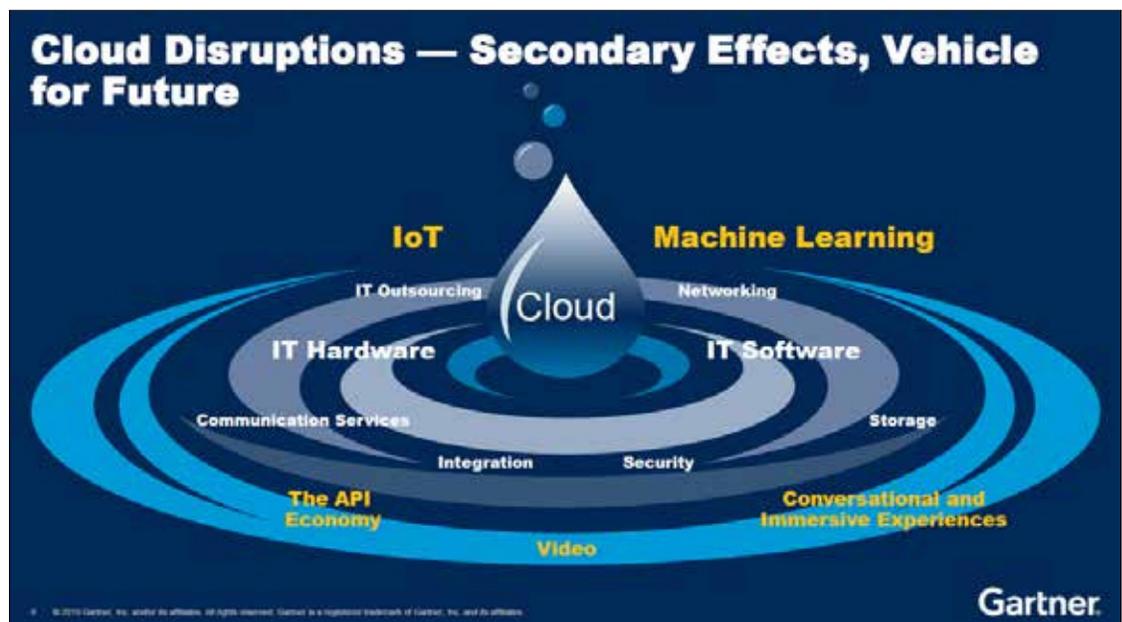
THE CLOUD COMPUTING SCENARIO: STRATEGY AND TACTICS FOR SUCCESS

Hyperscale data centers will contain one-third of the world's processing power by 2025.

—David Smith, Gartner

Observations about the current state of the cloud marketplace.

- **Cloud Computing Is Becoming the Primary Option, Not Just a Secondary Possibility.** About 70% of all organizations are now using cloud, with public cloud now the preferred model. Multi- cloud environments are growing; while adoption of private cloud persists, it is for traditional use-cases. Cloud growth comes from both new applications and cloud migrations, and the market continues to grow at a 17% CAGR.
- **Cloud Computing Is Disruptive:** “Disruptive” here means a “complete flip” on where we put a new workload. Ten years ago, technologies would have been implanted in the corporate data center; today cloud is the modern baseline for IoT; AI/ML; the API economy, quantum computing, big data, augmented reality and more.



THE CLOUD COMPUTING SCENARIO: STRATEGY AND TACTICS FOR SUCCESS (CONTINUED)

New “terms of art” include

- **Hybrid Cloud and Multi-Cloud:** worth checking the dictionary, David thought - hybrid is “of mixed character; composed of different elements” so it implies integration; “multi” just means more than one. A hybrid cloud comprises public and private clouds that operate as separate entities but are integrated.
- **Cloud Native:** means different things to different enterprises today. It’s vitally important to understand your definitions: for illustration, utilizing definition 1 will not get you to a full portability.

Cloud Native — Multiple Contradictory “Definitions” Are Already in Use

-  1. Use of native cloud platform features (e.g., PaaS, serverless, availability features, ...)
-  2. Focus on containers, Kubernetes, microservices — CNCF (Cloud Native Computing Foundation)
-  3. Architectural principles:
 - LIFESPAR — Latency-aware, Instrumented, Failure-Aware, Event-Driven, Secure, Parallelizable, Automated, Resource-Consumption-Aware (Source: Gartner)

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- **Edge Computing:** covered in the next section
- **Distributed Cloud:** the distribution of public cloud services to different physical locations while ownership, operation, governance, and evolution of the services remain the responsibility of the public cloud provider.
- **Repatriation:** (or bringing workload back inside from the cloud) which to this point has been more discussion than reality.

THE LIMITS OF THE PUBLIC CLOUD: REGIONAL DIFFERENCES

Henrique Cecci presented an eye-opening explication of regional differences: for example, AWS has more services and feature availability in Ireland than in Northern California, Tokyo, Sydney, Hong Kong or Singapore. Similar contrasts exist for Azure and GCP. The consensus feedback after this session was “Wow, I didn’t know a lot of that.” The session raises important questions for anyone planning to run in multiple regions.

EDGE COMPUTING

Bob Gill, Chief of Edge Research, ran two critical sessions entitled “Strategic Roadmap for Edge Computing” and “200 Enterprises Detail Their Use Cases for Edge Computing.”

Key takeaways include:

- **Edge workloads will be portable, and located where bandwidth, latency, autonomy and regulatory/compliance requirements are all balanced and optimized.**
- **Early edge use cases focus on vertical proofs of concept, but enterprises expect edge strategy to merge with cloud strategy.**
 - 61% of survey respondents see edge as part of cloud strategy.
 - Optimizing cloud costs was the most frequently named challenge that respondents hope the edge will help them to overcome.
- **Inhibitors to early adopters include complexity of data management, security, architectural complexity, control, and lack of skills.**
- **Go-forward advice for the next 12 months is to map the growing collection** of both explicit and innovative use-cases to business initiatives to help drive “infrastructure-led disruption”
- **“Cloud or Edge?”** When asked “Does your organization plan to use cloud/edge/both?” nearly 90% of edge-engaged enterprises surveyed expect to use cloud and edge computing synergistically

By 2022 – more than half of enterprise data will be created and processed outside the data center.

—Gartner Strategic Planning Assumption

While edge has been deployed for focused use cases (including many vendor led Proofs of Concept), edge strategy is widely viewed as a subset of cloud strategy. Bob suggests that the cloud architect or the enterprise architect to include the edge strategy and deployment; we don’t want “16 different stacks of incompatible hardware and software” as the result of siloed projects.

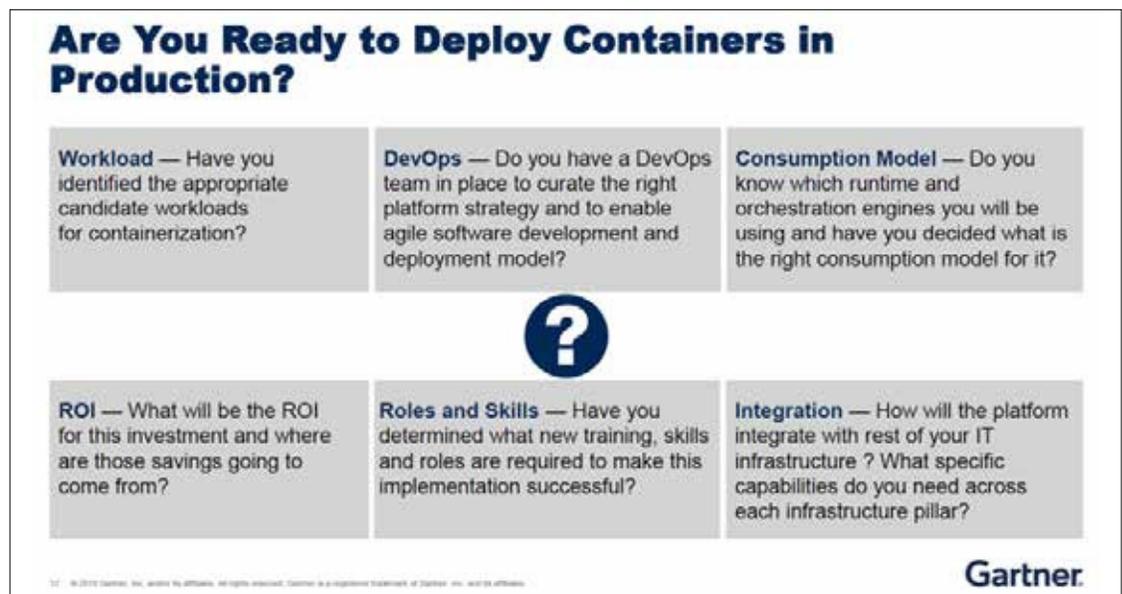
ADDITIONAL KEY TOPICS

It's impossible to do justice to all of the quality content at this event — a few final notes:

ON CONTAINERS

Arun Chandrasekaran provided “An I&O Leader’s Guide to Containers, Kubernetes and Microservices” at 10AM Monday, which indicated a high level of interest. A short summary of his key messages:

- Software is still eating the world; containers and Kubernetes are automating it
- Containers are a step in the evolution of virtualization
- Containers bring benefit not only to developers, but also to I&O (including enablement of hybrid/multi-cloud)
- Before deploying in production, some pragmatic questions need to be answered:



Arun’s recommendations are equally pragmatic:

- start with small, simple use cases,
- ensure that containers are stateless and immutable;
- training and participation with communities will develop competencies ahead of a rollout;
- integration of CaaS/PaaS with CI/CD, security and operational tools, augmented where necessary with best-of-breed tooling; and
- creation of a PlatformOps team that works with developers and remains focused on continuous improvement.

ON ARTIFICIAL INTELLIGENCE

Arun also presented on “Best Practices for Operationalizing Artificial Intelligence; and his colleague Chirag Dekate presented on “Five Ways Your Peers Are Using AI Today” (the headline: predictive analytics to prevent failure; event correlation/root cause analysis; optimizing infrastructure utilization; capacity planning and forecasting; and

IT Service Management. Chirag’s presentation contains the Strategic Planning Assumption that by 2023, 75% of enterprises will utilize AI-augmented IT management, driving disruptive IT productivity and business value. Chirag also presented on some of the common challenges, including “Tool sprawl” resulting in underutilization or under implementation, the challenges in navigating vendor hype, and the struggles in identifying the right vendor.

ON COST OPTIMIZATION

We appreciated the simplicity of this chart showing “pain vs gain” of cost reduction initiatives. Ron Blair counsels us to “follow the money” and notes that WAN optimization can save 20-70% for many. The thinking behind the 2x2 can guide all of us.



ON SPEAKING IN BUSINESS VALUE

As I&O is exhorted to become earn its seat at the leadership table, enabling disruption and innovation, it's essential that we learn to communicate in business value. 82% of I&O teams struggle with business value metrics; this chart from a resiliency session expresses how we sometimes “fail to communicate” – “what is said” vs “what is heard”



ON NEGOTIATION

As tactical takeaways from a conference go, you can't beat JoAnn Rosenberger's presentation- the practice of which can be worth literally millions of dollars in a complex negotiation. Contact GTSG if you'd like to discuss any of these in more detail.



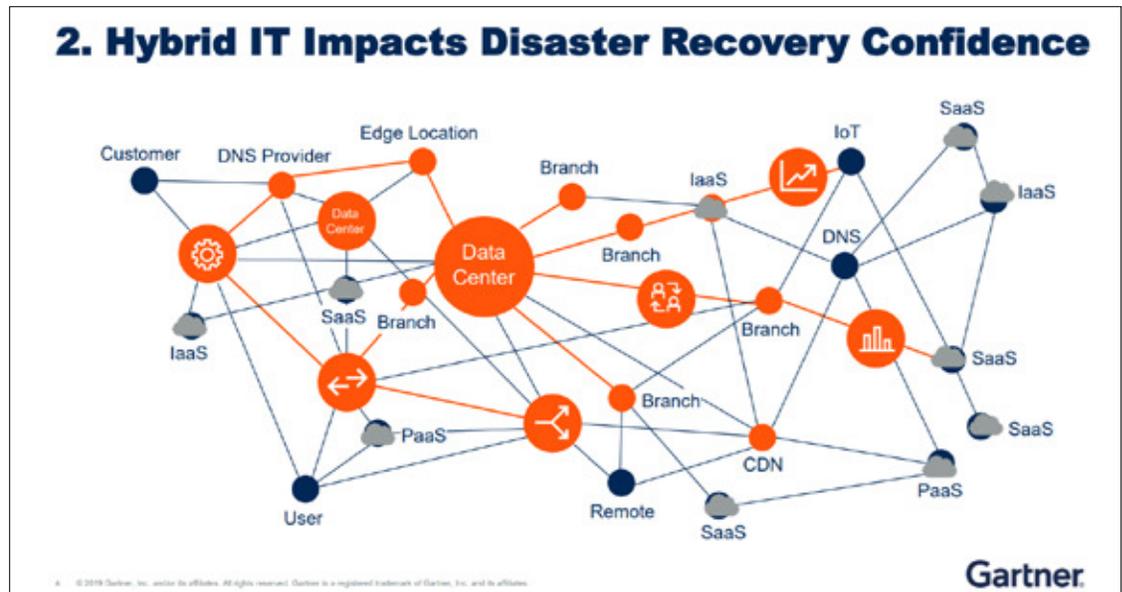
TOP 10 TRENDS IMPACTING INFRASTRUCTURE & OPERATIONS

- Automation Strategy Rethink
- Hybrid IT vs. DR Confidence
- Scaling DevOps Agility
- Infrastructure Is Everywhere
- So Is Your Data
- Overwhelming Impact of IoT Distributed Cloud
- Immersive Experience
- Democratization of IT
- Networking — What's Next?
- Hybrid Digital Infrastructure Management (HDIM)

Comments on several of these particularly relevant to GTSG's clients:

Automation Strategy Rethink: the good news is we've been doing it; the bad news is we've been doing it opportunistically- and therefore in islands. Someone in each organization will need to tie this together; Gartner believes that by 2025, 90% of firms will have an automation architect to manage the complexity.

Hybrid IT vs DR Confidence: This chart depicts the complexity of the Hybrid environment in which we all find ourselves to one extent or another:



By 2021, the root cause of 90% of cloud-based availability issues will be the failure to fully use Cloud Service Provider native redundancy capabilities.

This complexity drives us toward “pockets of DR”, resulting in the need to rethink DR from end-to- end. And “because something is in the cloud, it’s not automatically available” which hopefully we all know by now, but it needs to be said. They are not directly people toward DRaaS; that marketplace may be contracting. The key: consider DR as part of development, with application and resiliency architects talking to each other directly.

TOP 10 TRENDS (CONTINUED)

INFRASTRUCTURE IS EVERYWHERE

...and as importantly, data is everywhere. Infrastructure and data both need to be where the business needs them to be, for reasons ranging from latency to data sovereignty. This is as complex as it sounds, but the proper reaction to the silos that result, the AI/ML driven increase in data, challenges.

Recommendations included assessing the impact of data-driven infrastructure at early stages of solution design, investment in infrastructure tools to manage data wherever it resides, and the modernization of existing backup architectures to protect data wherever it resides.

DISTRIBUTED CLOUD

Known to some as tethered cloud; distributed cloud is defined as “the distribution of public cloud services to different physical locations while operation, governance, updates and the evolution of the services are the responsibility of the originating public cloud provider.

Providers have determined that they need to enable cloud-like services everywhere—including on-premises—if they want to continue to grow.

The notion began with multiple regions and is now extending to Edge. The Big Three have all announced solutions; Microsoft AzureStack, Amazon Outpost, Google Cloud Platform Anthos.

The key issue going forward, and particularly for I&O folks, is Day Two. How does this all play out? Who manages this infrastructure, who controls it, who owns it, and what if I want to switch providers? These questions are as yet unanswered “at scale” in the marketplace.

HYBRID DIGITAL INFRASTRUCTURE MANAGEMENT (HDIM)

Other implications include the number of issues in play, who negotiates with which partner in the ecosystem, who does the integration; what about lifecycle management? It’s a nascent market, so while listening to the vendors is fine, check references, and don’t simply believe the PowerPoint.

“Infrastructure is Everywhere” – but what clients need to know is how to discover it. When a customer calls with IT an issue, IT needs to know what nodes has the issue has been through, what other applications is it impacting, and how it all ties together. The challenge comes from the vertical organization of the team by technology stack, so they can’t figure it out. He sees that clients are looking for tools that help them to accomplish this.

This is an emerging market of tools, initially focused on asset tracking; intelligent discovery of the assets. This is an emerging market of tools and does not represent a “rip and replace” – these systems pull from ITAM and ITOM systems. No one vendor does all of this; in fact, one analyst advises us that if we’re speaking with a vendor who says they can do it all, we should walk away.

Thanks for reading through our summary. At GTSG, we make it our business to understand what Gartner is saying about the important challenges confronting our clients.

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If you'd like to discuss any of these topics further, please reach out to PARTNERS@GTSG.com.

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HYBRID CLOUD STRATEGY AND MIGRATION

Strategic Approach

- Business case development
- Transition planning
- Technical modeling
- Non-disruptive execution

Application Analysis Methodology and Tools

- Decomposition
- Affinities
- Wave planning

Project Leadership

Implementation Subject Matter Expertise

INFRASTRUCTURE SUPPORT SERVICES

Managed Services

- Multi-platform including DB & MW
- Service-level based or FTE-based
- Architecture, administration, programming, systems management
- Remote or Onsite

Project Based Services

- Platform upgrades
- Workload migrations
- Implementation services
- Consulting and Assessment (performance, DR, HA....)
- Project Management

INFRASTRUCTURE TRANSFORMATION

Transition Services

- Insourcing/Outsourcing
- Knowledge transfer and interim support
- Application migration
- Service management design

Disaster Recovery Design and Implementation

High Availability Design and Implementation

Application Assessment and Deployment

- Reference Architecture
- Infrastructure Alternatives/Recommendations
- Implementation/Migration

INFRASTRUCTURE OPTIMIZATION

Architecture Assessment and Design

Server Virtualization/Consolidation

Storage Optimization

Data life-cycle management

- Tiering
- Standardization/Automation

Application Decomposition Application

Re-design/Remediation Performance

Management and Tuning Latency

Analysis and Consulting