

OBSERVATIONS FROM GARTNER

THE INFRASTRUCTURE,
OPERATIONS AND CLOUD
STRATEGIES SUMMIT
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GLOBAL
TECHNOLOGY
SOLUTIONS
GROUP



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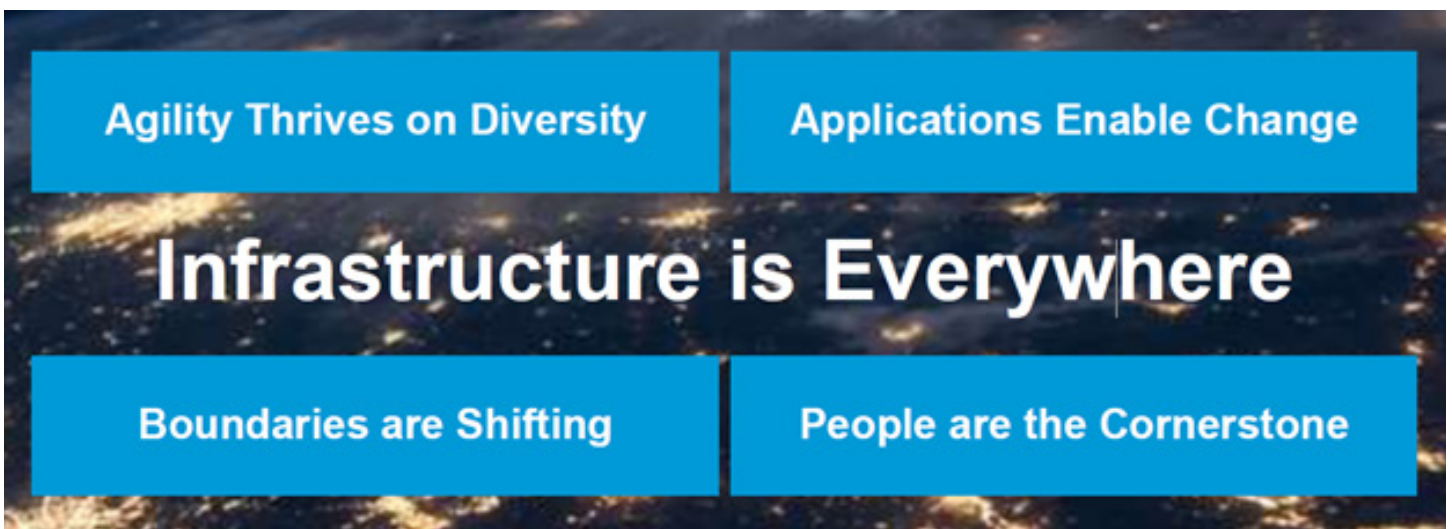
PREFACE

For the fifth consecutive year, GTSG participated at Gartner's December conference, renamed in 2018 as the **Infrastructure, Operations and Cloud Strategies Summit**. We'll summarize what we saw in the areas where GTSG is focused – helping our clients to strategize, plan, migrate, and improve the delivery of service to the business, from the properly architected combination of on-premises, co-located and cloud resources.

KEYNOTE: “ALWAYS ON, ALWAYS AVAILABLE, EVERYWHERE”

Newly appointed conference chairs David Cappuccio and Robert Neagle “pivoted” the event, as was reflected by its title, its appeal (more cloud providers in the Expo), and the diversity of approach to service delivery. The event is no longer solely focused on the traditional data center, but focused on the “Always On, Always Available, Everywhere” mantra they have used to describe the holistic digital infrastructure, which is architected and managed to meet the needs of the business.

After Cappuccio opened, four speakers fleshed out the themes reflected in this graphic:



- Bob Gill spoke on diversity, moving from the controlled environment of the past (everything under the control of the data center), and advised setting the baseline role of I&O as one of product manager and integrator.
- Dennis Smith talked about the “marketplace of opportunity” and the tools that make this an unprecedented time to be an application developer. He built on Bob’s premise that the direction moves to product, with Infrastructure & Operations focused on Automation, Governance, Service Management, and Business Continuity, among other traditional I&O values.
- Tom Bittman discussed the shifting boundaries of infrastructure, noting Gartner’s assumption that by 2022, 50% of enterprise-generated data will be created and processed outside the data center or cloud. The immersive experience is coming fast; bandwidth is still a significant cost, and because data is transient, some processing must remain at the edge.
- Kris Van Riper introduced the focus on people which was prevalent throughout the event, noting that 75% of I&O leaders are not prepared with the skills, behaviors or mindsets needed over the next two to three years. Skill development and career management have changed, she tells us, from a linear approach to multiskilling and career versatility.

The “pivot” in the conference reflects the change in enterprise behavior—the integration of cloud, edge, colocation and the data center to form one digital infrastructure—one function, one role for I&O to manage. (One survey in another session indicated that 94% of organizations would run hybrid.)

There’s an urgent call to action for I&O – many see us as neither fast nor agile enough – but Cappuccio implied there’s hope, if we can come to the table and **partner with the business to enable it**, rather than simply focusing on protecting the business from itself.

THE NEED FOR STRATEGY

Stated perfectly by analyst David Smith: “The best time to do a cloud strategy is five years ago. The second-best time is now.”

Mindy Cancilla’s Tuesday morning keynote asserts that the verdict is in: cloud is faster/cheaper/better, **when** (and this is essential)

- **Applied to the right workload** (hence the ongoing need for hybrid cloud workload placement strategy), and
- “**Done right,**” underscored by Gartner’s strategic assumption that through 2020, organizations that lack cost optimization processes will average 40% overspend in public cloud.

Yet poll results from another session tell us the following about cloud strategy:

- 49% have no formal cloud strategy,
- 30% have a strategy, but it’s mainly about adoption/migration and implementation,
- 6% have a strategy, but it’s more of a Data Center strategy,

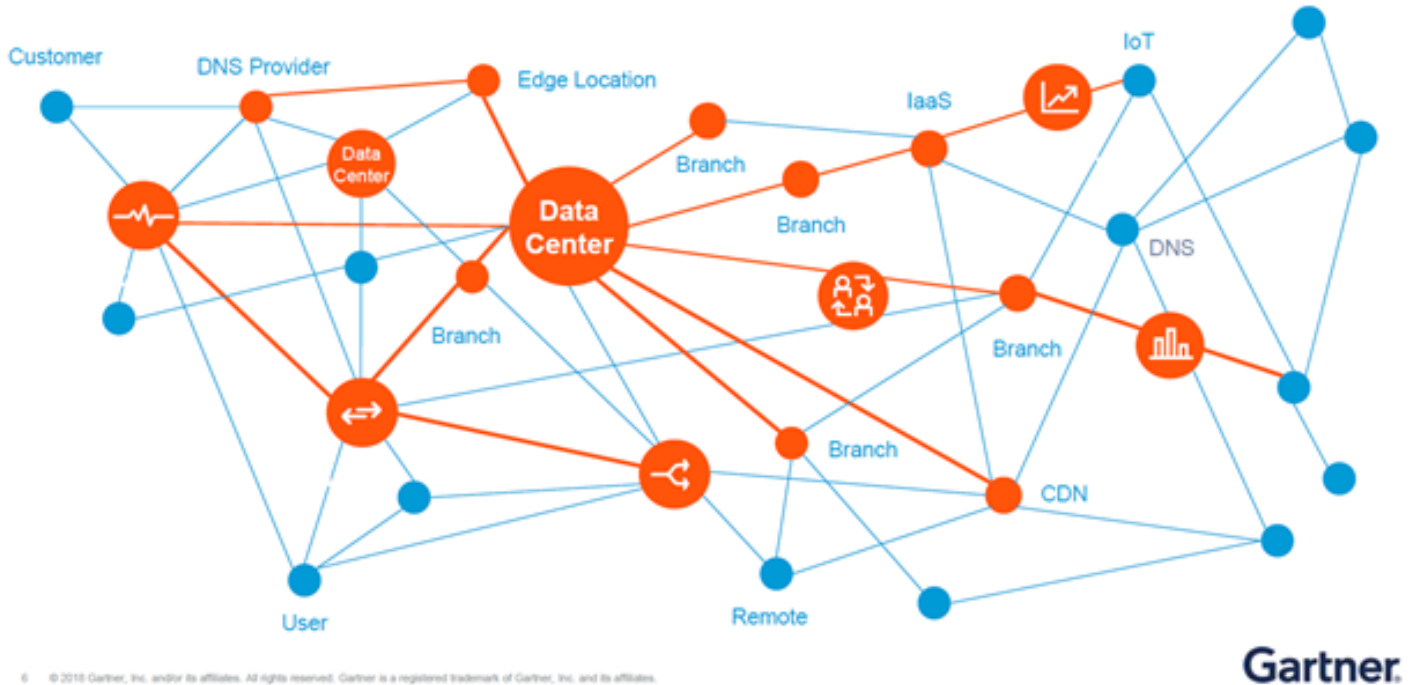
... with only 9% believing that they have a robust cloud strategy.

In one of our 1:1 meetings with a key cloud analyst, the analyst shared his taxonomy of cloud adopters into “cohort” classes, of which he sees four – from

- the earliest cloud adopters, to
- the forward thinking in 2009-12, adopting for systems of engagement. Some of these organizations may be moving from development teams with a smaller footprint to a broader deployment,
- a middle group, adopting in 2013-17 who have relatively modest spend today, and are looking to move forward, but need to understand the workload decision criteria, and
- later adopters, who have made initial forays to the cloud over the past couple of years.

In the keynote, Bob Gill presented this compelling graphic:

Short Term – Imposing Order On Chaos



BY 2025, 80% OF ENTERPRISES WILL HAVE CLOSED DOWN THEIR TRADITIONAL DATA CENTERS, VS. 10% TODAY

Combine this complexity with the Strategic Planning Assumption presented by David Cappuccio: **By 2025, 80% of enterprises will have closed down their traditional data centers, vs. 10% today.**

It's clear that most organizations will need a strategy – not only to determine where the workload goes, but also to establish the approach to its architecture, management and governance.

THE HYBRID FUTURE IS HERE, AND IT'S COMPLEX

ON MULTI-CLOUD AND PARTNER SELECTION

One of the key analysts in Gartner for Technical Professionals (the “how-to right now” division of Gartner), Elias Khnaser, states that nearly every one of his client discussions includes multi-cloud.

Multi-cloud defined: according to Gartner, multi-cloud computing refers to the use of cloud services from multiple public cloud providers for the same purpose; it is a special case of hybrid cloud computing.

So why the prevalence of multi-cloud? Most organizations past a certain scale have development or business groups in the cloud; some providers have strengths which were more appealing to the developers who undertook the initiative. This is one of several reasons why Gartner so strongly recommends a cloud architect, who is responsible to understand how these pieces fit together.

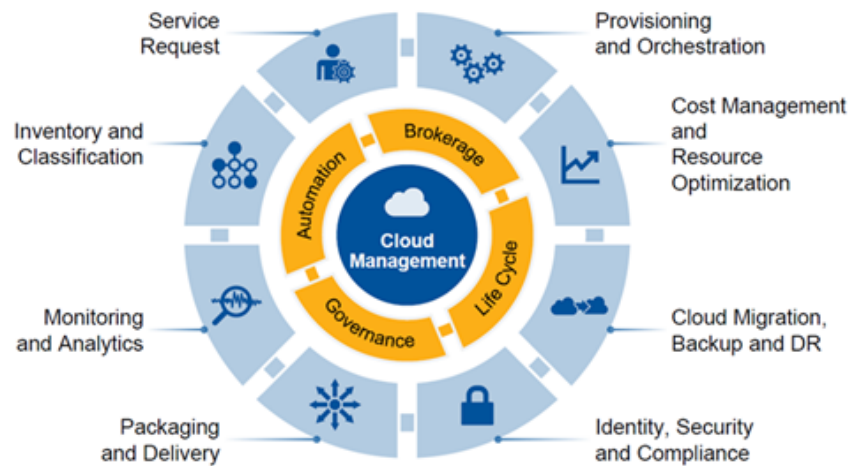
Client choice can increase even as functional differentiation among the “Big Three” cloud providers continues to fade- as evidenced by this chart, which depicts compliance with Gartner’s 263-question requirements document.

IaaS Provider	2016	2017	2018
Amazon Web Services	92%	94%	93%
Microsoft Azure	88%	93%	95%
Google Cloud Platform	70%	80%	85%

ON MANAGEMENT AND GOVERNANCE

Cloud management functionality is substantially an extension of capabilities which have been required in the traditional data center. When GTSG advises clients on cloud strategy, we incorporate a review of these vital processes and the tools and organizations that make them work. Only with rigorous attention to the functions represented in this wheel can an organization best mitigate risks to availability, security & privacy, and cost management.

The Cloud Management Wheel



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Elias Khnaser delivered a session on “Mistakes to Avoid” with the two most prominent providers, which can be summarized as the intersection of “pay attention to these very same fundamentals, the same functions as when you planned on-prem operations,” and “know the platform you’re utilizing.” **This session drew over 700 attendees.**

ON RESILIENCY

Resiliency continues the theme: the technology advances, but the need for basic disciplines does not change. In the case of resiliency, while there are today over 500—*five hundred*—DRaaS providers of various types, the process still begins with understanding the requirements of the business.

Recommended Approach



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As analyst Ron Blair's graphic depicts, whatever the complexity of the provider marketplace, it's in the internal homework. The lion's share of the work is in communication with the business, and the explanation of, negotiation through and agreement upon the relative costs of varying RTOs and RPOs.

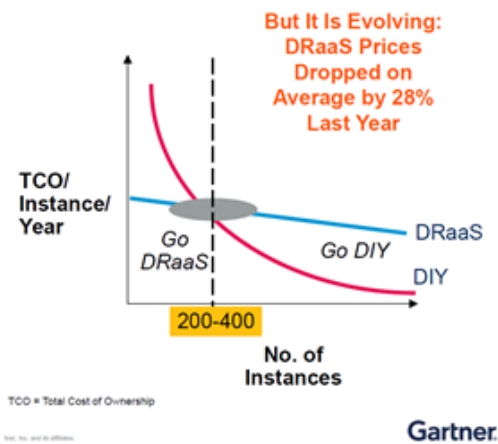
Additional point of emphasis: **mission-critical business process target RTOs were expressed by 67% of recent respondents as less than four hours, and 37% at less than 60 minutes.** This heightens the need for real dialogue about costs and methods between IT and the business, because as we have written elsewhere, a dollar spent overprotecting one business process is taken away from another. Virtually no one has resilience investment dollars to spare.

Another message which still warrants emphasis: simply migrating to the cloud does not protect by default. Gartner assumes that, by 2021, the root cause of 90% of cloud-based availability issues will be the failure to fully use CSP native redundancy capabilities.

In 16 of the past 22 months, major cloud services providers have had an outage lasting 4 hours or more. Only one of these failures exceeded the CSP's service level agreements.

Back to the top of this section: If we don't understand the requirements, we won't know if they are not being met.

DRaaS pricing is improving and becoming a more relevant discussion point for more and more firms: Ron Blair’s presentation included this assessment of a typical breakpoint for DRaaS vs Do It Yourself approaches.



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Solution design and selection are vitally important: Gartner has observed a \$1.2M difference between the high and low range of DRaaS prices across 150 servers over 36 months.

Ross Winser closed the conference with a presentation on **Resilience Debt**, which he defines as “a form of technical debt that occurs when leaders prioritize the pace of delivery above the need for investment in resilience.”

The causes of such resilience debt were distributed among:

- 18% - *Rapidly changing business expectations*
- 16% - *Lack of collaboration between IT teams*
- 23% - *Resilience is seen as an IT problem to deal with alone*
- 13% - *Low maturity in new ways of working (e.g. Agile)*
- 16% - *Weak designs when using new technologies (e.g. public cloud)*
- 13% - *Inflexible infrastructure that cannot adapt fast enough*

but the top three responses, totaling 57% of an attentive crowd, indicate that despite — or because of — the pace of change, and because of the financial and reputational cost of interruption to the business, we in I&O need to articulate the need to **design for resilience as new capability is introduced.**

EDGE COMPUTING

Edge computing, and what drives it, took a position “front and center” at this year’s event. After being featured in the keynote, there were stories from the edge, sessions on how to avoid project pitfalls, and vendors presenting their own architectures designed to meet these challenges.

Gartner distinguishes between

- **The Edge**, which is the physical location where things and people connect with the networked digital world, and
- **Edge Computing**, a part of a distributed computing topology in which information processing is located close to the edge—where things and people produce or consume that information.

Edge is not simply the “edge of the cloud.”

- Data lives here - data at the edge will explode, and most will never leave the edge.
- Agility trumps cost - real-time, local analytics will often be more important than back end.
- Diversity rules—the edge will be a wildly diverse set of use cases, technologies, requirements.
- Most interactions will be local: things and people will be chatty and needy, locally.

What’s Driving Edge Computing is this convergence of physical and digital; an explosion of connected, noisy, needy things; and of augmented and virtual reality, immersive experiences.

Immersive technologies are more relevant than we may initially suspect: if we have customers or customer locations requiring richer, personalized experiences; real-time interaction; knowledge workers or mobile workers, with flexible work environments, for virtual team collaboration; for the productivity of field employees or equipment maintenance.

GARTNER ASSUMES THAT BY 2022, MORE THAN 50% OF ENTERPRISE-GENERATED DATA WILL BE CREATED AND PROCESSED OUTSIDE THE DATA CENTER OR CLOUD.

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How does all of this affect the I&O team?

- Movement from few to many “nanodatacenters”
- Management of highly distributed infrastructure
- Management of highly distributed data
- Appropriate security at depth, and everywhere

Some additional key assumptions helping us to think about the next three to five years at the edge:

- Half of large enterprises will be integrating edge computing principles into 2020 project; two-thirds of respondents say that edge computing will be a part of their enterprise IT planning the end of 2019.
- By 2021, 25% of enterprises will have deployed or are leveraging a micro modular data center, up from less than 2% in 2018.
- 40% of enterprises will have an edge computing strategy in place by 2021, up from less than 1% in 2017.

TOP TEN TRENDS IMPACTING INFRASTRUCTURE & OPERATIONS

This list is at once a high-level summary of some of the key points above, but also an alert on some topics which will be important over the next several years.

The list, with a brief comment on each:

1. **Serverless computing:** will be included in designs, have cost implications, and present new management challenges.
2. **AI Impacts:** Gartner assumes that Global AI derived business value will reach nearly \$3.9 trillion by 2022. While AI does not replace skilled decision-making, scaling today's contained pilots will introduce new issues and support expectations of I&O will shift.
3. **Network Agility (or Lack Of?):** Gartner assumes that by 2022 there will be a 50% increase in the number of enterprises deploying automation in the access layer. To prevent network team burnout, and the siloed development of IoT solutions, Gartner urges focus on automations, analytics, skill building, and the reward of innovation as well as availability.
4. **Death of the Data Center:** Gartner predicts that the proliferation of edge data, ongoing migration to cloud, and the desire to entrust physical data center management to the professionals in colocation (as well as for connectivity strategy) will cause 80% of enterprises to shut down their data center by 2025.
5. **Edge Computing:** discussed at length above, 50% of data to be generated there soon.
6. **Digital Diversity Management:** managing the sprawl depicted here makes capacity optimization and analysis harder, introducing cost and risk. Automation, AI decision support, and skills are required to mitigate.
7. **New Roles Within I&O:** Aggregation, customization, integration and governance are key functions under the brokerage umbrella. The business needs I&O at the table to fulfill these functions.
8. **SaaS Denial:** as with item 7, resilience, integration and governance concerns mandate I&O expertise and involvement in a category of solution which to this point I&O has not emphasized.
9. **Talent Management Becomes Critical:** emphasizing the T-shaped skill set –broader, but with depth; and the collaborative approach to work that is necessary in the age of agility.
10. **Global Infrastructure Enablement:** promoting both the best in delivery today and understanding innovation investment and roadmaps for the future, from suppliers and their teams.



PEOPLE, ORGANIZATION, SKILLS, TALENT

Katherine Lord opened *The Future Infrastructure & Operations Design* with Gartner's assumptions that

- through 2020, **80% of I&O leaders will restructure** for digital,
- **60% will fail** to deliver the expected value,
- **89% of I&O functions are not ready** for Digital Business, but rather are optimized for custom-made technology projects,
- by 2022, Gartner assumes that **40% of I&O leaders will adopt a product-oriented operating model**, up from less than 5% in 2018.

Katherine presented highly specific maturity models to improve upon I&O's readiness and adapt the organization to product-centricity. Product-centricity was defined as focusing the organization on engagement with consumers, on engagement with the API infrastructure, automation, the building of adaptable infrastructure, and sensing the “things” infrastructure to monitor and manage.

The Gartner-presented organization work was amplified by guest keynotes: Dr. Kelly McGonigal on effective tools for managing stress, former Commander Mike Abrashoff, who transformed his organization into the best ship in the Navy, and former Air Force Secretary Deborah Lee James on more effectively partnering with the business.

Secretary James spoke from the perspective of a senior leader tasked with transformation and said that IT is too frequently seen as a “Department of No” by business leaders. She strongly encouraged her audience to help bridge the business/IT chasm; while business leaders sometimes think that technology is ‘fast, seamless and easy,’ technical leaders need to become better partners, and translators of what we do, so that the business leaders will understand the hesitancy they sometimes hear. She advises business leaders to invest in their technical people's business acumen, to build trust and shared understanding.

Attendance in some of the event's organization sessions exceeded several more traditionally popular, technical topics—strongly suggesting that after several years of growing concern, the organization, skills and talent management issues has arrived at the top of I&O priority lists.

OTHER HIGHLIGHTS

Space doesn't permit a discussion of everything covered at this event – by our count, over 140 speakers for over 220 sessions.

- Infrastructure supporting **Artificial Intelligence** was discussed.
- By 2020 only 10% of all **blockchain** POCs will have moved into a business operation state. (This is probably a good thing, because most organizations don't feel ready.)
- **Midsized enterprise** concerns were well represented with analyses of the trends most impacting these shops, and an approach to cloud strategy which sets direction without incurring an unmanageable burden of consultative or analytical overhead.
- JoAnn Rosenberger did an excellent session on utilizing Gartner methodologies in **negotiation strategy**. One simple yet profound suggestion was to engage the PMO for a significant negotiation. Given the millions of dollars at stake, it makes perfect sense to make sure that a large team is held to task, to maximize the leverage that comes from executing a strategy when properly prepared.
- The **mainframe** (a big part of our GTSG heritage) continues to grow in workload- 40 million MIPS installed, twice the number of five years ago, albeit on a smaller installed base. Over 30% of capacity installed is Linux. Some of Mike Chuba's highlights included:
 - advice on managing software costs,
 - “mainframe and the public cloud - one or the other?” (workload placement strategy)
 - mainframe talent,
 - and setting the strategy for the platform

all four of which issues GTSG helps clients with every day.

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.

If you'd like to discuss any of these topics further, please reach out to ITSERVICES@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