FROM THE NEW NORMAL TO THE NEXT NORMAL IN THE DATA CENTER
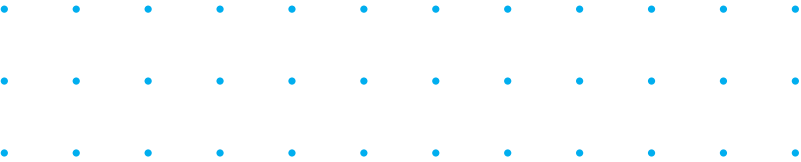
Monitoring & Maintenance Strategies to Enhance Resilience During COVID-19 and Beyond

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Executive Summary

The global coronavirus pandemic revealed gaps in data centers' business continuity planning. Faced with a rapidly changing, enduring, worldwide crisis—which confounded preparations designed primarily for isolated, short-term emergencies—IT leaders have come to realize the "new normal" will remain a moving target for months to come.

Data center managers are striving to prepare for additional coronavirus outbreaks, which health professionals deem likely. The most forward-thinking leaders, however, are intent on leveraging the heightened attention to infrastructure future-proofing to also enhance readiness for a full array of crises not adequately reflected in existing contingency plans.
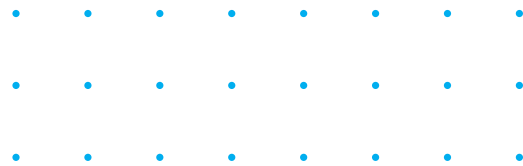
That such blueprints must take into account today's increasingly hybrid, distributed infrastructure poses particular challenges for data center monitoring and maintenance. Indeed, COVID-19 has exposed vulnerabilities endemic to the current approach to these fields.

Fortunately, there exist both processes and technologies to help resolve pressing support-related issues in complex digital environments. By implementing appropriate risk mitigation and maintenance prioritization, adopting strategies to maximize staff availability, and investing in network resources and remote monitoring tools, data center leaders can withstand the next interruption, whatever its cause, reach, or duration, and thrive in our increasingly uncertain era.

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The "new normal" will remain a moving target for months to come.

Introduction

The COVID-19 pandemic rapidly transformed the concept of business continuity for IT professionals around the world. An industry that boasts instructions and checklists for nearly every localized eventuality—internet outage, hurricane, or armed conflict—was met with something few predicted: a months-long, global crisis that spared almost no facility on the planet.

Severity of COVID-19 outbreaks and government responses have varied from the country level down to the local level, creating a disorienting tapestry of on-the-ground realities to which enterprises have been forced to adapt. Many IT organizations found they hadn't developed an adequate playbook and have been shaping and refining their responses on an ad hoc basis as the crisis unfolds.

Although there have been relatively few major, public-facing IT failures so far, industry professionals sense that, had the initial wave of COVID-19 been even incrementally more severe, devastating operational consequences could have ensued. This realization is driving attention to contingency preparations for a wider range of potential crisis scenarios, including additional coronavirus infection spikes, other types of public health emergencies, diffuse manmade threats such as bioweapons, and enduring climate change impacts.

Day-to-day monitoring and maintenance have presented significant challenges during COVID-19, as data center facilities usually bustling with engineers were hollowed out. With the sudden shift to remote work and almost exclusively digital customer engagement, data centers also confronted evolving business requirements that pushed existing infrastructure, and with it their support solutions, to the limit.

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This paper outlines strategies for mitigating these data center maintenance issues, many of which are likely to continue for the foreseeable future, and ensuring uptime in the most difficult scenarios. Specifically, we explore:

- Key considerations for risk assessments and maintenance prioritization

- Measures to help maximize availability of essential expertise

- High-impact network investments to improve agility, enable remote oversight and management, and cope with limited facility access

- Intelligent hardware monitoring solutions to bring predictive analytics and remote triage capabilities to data center assets

We offer these recommendations in the hope that they help data center leaders in future-proofing their infrastructures at a time when no one can predict with confidence what the future holds.

Infrastructure Complexity Meets COVID-19

Much of the coverage of COVID-19 celebrated the ways in which recent technological developments helped individuals and businesses through the lockdowns. From Zoom meetings and distance learning to online banking and Netflix, digital solutions kept life and economies moving.

More rarely highlighted, on the other hand, is the extent to which the digital transformations enabling such applications has also increased infrastructure complexity. Whereas a decade ago, IT hardware was consolidated into one, or relatively few, centralized locations, today's enterprise IT environments have become highly diverse, driven by such trends as:

- **Growth and consolidation** resulting in more data center locations with a wider variety of architectures and disparate hardware installations (This text does not speak to consolidation)

- **A cloud transition** that puts platforms, applications, and data in additional locations and exerts new pressures on network operations

- **Emergence of colocations** as an attractive alternative to owning and operating data centers, but still allowing for company control of these off-site assets

- **A rapid expansion at the edge,** with significant edge hardware deployments in retail, manufacturing, health care, and other sectors

Monitoring and maintenance, therefore, evolved from oversight, troubleshooting, and repair conducted primarily by on-site staff at a handful of data center locations to a time-intensive process involving:

- Travel to and from multiple data centers and other facilities to check the status of and service IT hardware

- Management of numerous, often OEM-specific, monitoring tools providing siloed views into enterprise networks and equipment

- Coordination of a variety of partners to conduct maintenance, on both a scheduled and break/fix basis

As a result, most technology groups find their hardware monitoring and maintenance has become inefficient and, in many cases, it is now detracting from digital transformation and other big picture initiatives.

A MAY 2020 PARK PLACE TECHNOLOGIES POLL FOUND

71%
Feel that their current hardware monitoring and maintenance process is inefficient.

42%
Said they don't have enough time to focus on digital transformation and other big picture initiatives.

38%
Feel that Covid-19 restrictions are making it more difficult to manage their data centers.[i]

When these trends ran headlong into the COVID-19 pandemic, numerous issues quickly emerged. For example:

- Remote workforces tested IT infrastructure capacity, and managing the impacts on network bandwidth, among other effects, occupied a disproportionate amount of staff time.

- The health threat of the virus, as well as quarantine requirements after possible exposures, undermined availability of already limited IT experts.

- Travel restrictions, shelter-in-place requirements, and work-from-home policies prevented or reduced physical access to hardware.

- Budget concerns in economically hard-hit industries led to spending freezes and cost control initiatives that continue to hamper IT investments.

These outcomes aren't going away. Companies expect to sustain an increased level of remote workers and/or to remain "work-at-home ready" in case additional waves of infection result in new restrictions. And consolidation in many is likely to accelerate due to economic impacts. Meaning of this sentence?

ACCORDING TO MARCH SURVEY BY 451 RESEARCH

38% of companies expect work-from-home to become long-term or permanent.

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What's more, data center leaders are heeding health experts' warnings that another pandemic is not a matter of "if" but rather "when." Unfortunately, achieving resilience goals can actually exacerbate complexity, demanding more distributed IT architecture, with offsite backups, mirrored data center facilities, multi-cloud integrations, and so on. Without appropriate tools and strategies in place, monitoring and maintenance can prove problematic and, ironically, delayed failure recovery can result in performance declines and the costly downtime continuity measures were intended to avoid. This is the battle we fight.

Future-Proofing Data Center Monitoring & Maintenance

The theme underlying many coronavirus-driven data center upgrades is improved remote management. More powerful remote monitoring and maintenance capabilities reduce the need for physical access to networking, server, and storage hardware, an important factor in a public health crisis. Thus the advantages of the software-defined data center (SDDC), which the industry had already begun to pursue, have become especially enticing during COVID-19.

Fully "lights out," remotely controlled operations are not yet possible for most enterprises. As Uptime Institute's Fred Dickerman told Network World, running a data center unmanaged is like "closing your eyes [and] driving your car on a straight stretch of highway…You don't want to do it for too long." ii

Available solutions are, therefore, neither wholly technical nor exclusively policy-based. Enterprises are striving to pair increasingly capable automation and remote management applications with the processes and protocols required to ensure continued involvement of expert technical personnel in maintaining systems. Here are some of the ways they are doing it.

Enhanced Risk Assessment, Prioritization, and Planning

For some time, mirrored, geographically disparate data centers with automatic failover were considered the premiere business continuity solution. Sadly, the large-scale coronavirus pandemic exposed the shortcomings to this approach. Expecting to run critical workloads temporarily in a backup facility proved insufficient against the COVID-19 maintenance challenge, because assets in these data centers, too, eventually require attention.

As a result, companies are now developing tiered maintenance plans for enduring crisis scenarios, taking into account such factors as:

- Business criticality evaluations of particular workloads, a longstanding IT best practice
- Expected staffing/facility impacts, from near-normal levels of on-site management to, worst case scenario, complete lack of physical access to the data center
- Preventive maintenance prioritization based on risk assessments of system vulnerabilities

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The goal is to sustain at least critical maintenance, to the degree possible, with alternatives and fallbacks for when facilities are inaccessible or staff unavailable. Over the short run with limited access, enterprises can cycle between redundant components or shift workloads to the most bulletproof equipment in the arsenal, where possible. But equipment shutdown and isolation protocols and failover procedures should be honed to prevent cascading impacts from hardware failures, should severe facility access limitations continue. It is also vital to put in place processes and systems for tracking deferred maintenance and scheduling tasks for the most mission critical and vulnerable systems as soon as the situation on the ground allows.

Other recommended planning activities may not appear fundamentally maintenance-related at first blush but will affect ongoing maintenance capabilities. Compiling arguments regarding the essential nature of data center workloads, for example, may fall to executive or legal staff, with input from data center managers, but it can enable rapid application for exceptions to lockdown rules and enable higher levels of ongoing maintenance activity. Also contributing to effective maintenance in a crisis environment:

- Establishing "rainy day" maintenance funds and streamlining emergency budget approvals

- Renegotiating vendor SLAs for various scenarios to guarantee the critical services, with any reasonable crisis-related compromises worked out in advance

- Implementing dual sourcing or engaging a third party maintenance provider with local reserves and diverse sourcing for spare parts and components

In other words, data centers should prepare to access necessary resources in an unfolding situation without undue bureaucracy or surprise.

Facility & Staffing Preparations

The most important resources from a monitoring and maintenance perspective are a date center's experienced team members and partners. Staffing requirements vary from facility to facility, with some modern data centers designed to operate with as few as three individuals on site at any time. But ensuring that necessary staff members are available and can be focused is a universal concern.

Core action items for staffing resilience include:

- Developing and communicating safety protocols to protect staff members to provide a basis of trust

- Stockpiling equipment and supplies, whether comprising personal protective equipment and sanitizer or extending to sleeping accommodations, water and water purification equipment, food, and medical supplies to allow staff to remain on-site for days or weeks to sustain critical operations

- Creating scheduling models, such as group scheduling in which team members work with the same individuals each shift to avoid viral cross-contamination

- Cross-training strategically to expand the pool of individuals with institutional knowledge and vital skills

- Innovating at-a-distance maintenance, such as AR-assisted call-ins to on-site personnel, to isolate individuals with difficult-to-find skill sets

- Researching smart hands services to expand the bench and provide fallbacks should key staff become ill or otherwise unreachable

- Establishing diverse, resilient communications structures to disseminate information and support contactless shift handovers

- Supporting employees with adequate rest and downtime, honest communications, and mental health resources

- Designing back-to-work protocols to ensure safety once a health or other emergency has passed

The many elements involved in data center staffing will prompt some enterprise leader to consider accelerating cloud migrations or moving to full-service colocations so they can hand off these responsibilities to third parties. This push is, however, being counterbalanced by heightened budget concerns in many sectors and a reticence to embark on disruptive projects.

A more viable alternative at the present moment will often be to work out third party maintenance partnerships to augment in-house expertise and provide prompt access to engineering expertise should the crisis affect critical staff members.

Network Investments

Since the onset of COVID-19, telecoms have been fielding requests for additional circuits to support remote workplace applications and keep up with the surge in traffic. From an internet standpoint, private networks have exhibited more problems than the intensively redundant and load-managed public internet, although last-mile connectivity and competition for sometimes limited home-based bandwidth has downgraded application performance for some employees.

To address traffic bottlenecks with optimized bandwidth utilization and increased flexibility, forecasters predict continued growth in the SD-WAN market. Additionally, network security has been a stumbling block and many enterprises are working to transition from older "fortress model" best practices to more innovative models capable of accommodating the remote workplace, bringing in outside consultants, as needed.

The VPNs providing secure, frequently firewall-protected access to enterprise-hosted and cloud applications deserve particular attention. Their rigidity can compromise application performance when used by high volumes of remote workers. The Uptime Institute is among the many organizations recommending that all enterprises stress-test VPNs for worst-case scenarios.

THE 451 RESEARCH SURVEY FOUND THAT:

41% of respondents feel COVID-19 strained internal IT resources

32% plan to spend more on bandwidth and network capacity[iii]

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Most importantly, network visibility and performance monitoring tools are now central to ongoing operations. These solutions enable on-site and remote network staff to discover, monitor, manage, and optimize a complex network integrating an array of different vendor equipment. And such features as continual device discovery, advanced event management, and application path monitoring have become indispensable in rapidly evolving crisis situations, in that they:

- Provide an up-to-date picture of the network after each and every change

- Reduce event noise to permit effective management by fewer networking professionals who may be available in an emergency

- Enable a high degree of remote network management to limit the need for on-site personnel

- Target any unavoidable engineering call-outs, such as to resolve critical networking hardware failures, based on essential business needs and increase first-time fix rates

Fortunately, more integrated solutions like Entuity Network Analytics are now providing highly intuitive interfaces to gain network visibility and control via a single pane of glass.

Remote Hardware Monitoring

Last but certainly not least for data centers in the post-coronavirus world is a remote hardware monitoring solution. These systems have advanced substantially in recent years, taking advantage of machine learning. Intelligent monitoring applications like Park Place's ParkView Hardware Monitoring™ now establish a baseline of what normal data center operations "look like" at the hardware level and integrate predictive analytics to alert IT staff when changes indicate potential failure.

With such tools, possible outages can be more accurately assessed and proactively managed when data center access issues may come into play. Rather than experiencing an unexpected server crash at 1 AM when a curfew restricts safe travel to the site, for instance, the issue can be diagnosed and solution effected hours or days earlier, with greater latitude to account for crisis-related complications.

Not only helpful when unexpected events strike, proactive hardware with ParkView Hardware Monitoring™ is an investment with immediate payoff. Such a system can:

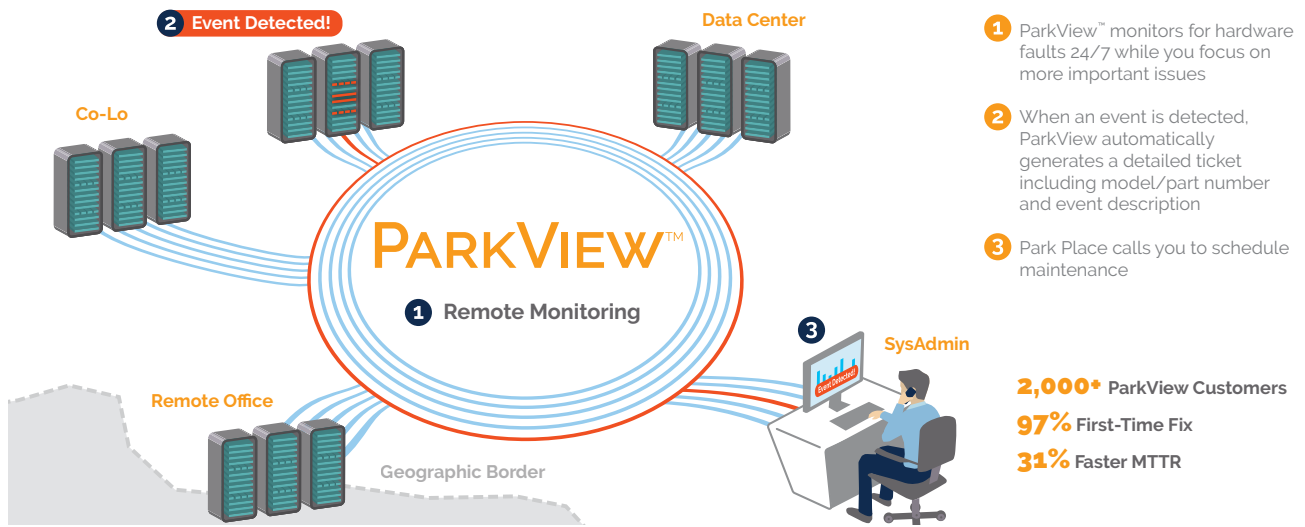- Slash the time and investment in visiting satellite offices and other remote sites to check in on and maintain hardware

- Dramatically decrease the amount of time IT teams spend identifying hardware faults, triaging issues, and managing the fix process with their support providers

- Lead to faster, more accurate fixes and reduce or eliminate cost associated with downtime

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Importantly, ParkView provides visibility spanning all enterprise data centers and colocation facilities where hardware assets are deployed.

ParkView integrates hardware monitoring across complex, geographically diverse, multivendor infrastructure into a single pane of glass.

WE'RE THERE 24/7, SO YOU DON'T HAVE TO BE.

2 Event Detected!

Data Center

Co-Lo

PARKVIEW™

1 Remote Monitoring

Remote Office

Geographic Border

3

SysAdmin

1 ParkView™ monitors for hardware faults 24/7 while you focus on more important issues

2 When an event is detected, ParkView automatically generates a detailed ticket including model/part number and event description

3 Park Place calls you to schedule maintenance

2,000+ ParkView Customers

97% First-Time Fix

31% Faster MTTR

The industry's only fully-automated maintenance service, ParkView also streamlines the hardware support process by proactively identifying hardware events, automating the triage process, and opening incident tickets with all the information field engineers require to fix the problem in a single visit. Integrated with Park Place's responsive support services, ParkView notifies our team of the issue so engineers can be dispatched for fast, efficient problem resolution.
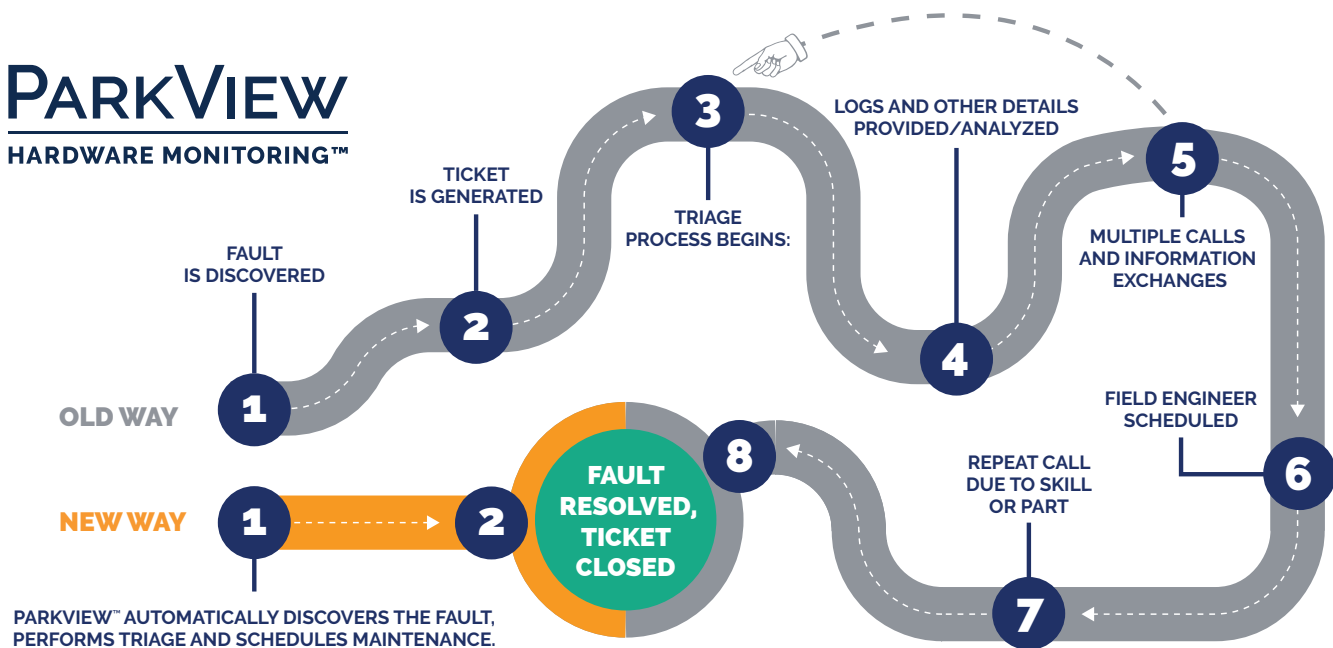
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"I no longer have to have staff walking server room floors keeping an eye out for red lights and ParkView gets to the core of exactly what is going wrong the first time, every time. That's a winner as far as I'm concerned."

- Paul Alexander, Head of Technical Services
  STEM Faculty, The Open University

ParkView reduces the number of touchpoints between customer and service provider from an average of 8 to just 2.

PARKVIEW
HARDWARE MONITORING™

OLD WAY

1 — FAULT IS DISCOVERED
2 — TICKET IS GENERATED
3 — TRIAGE PROCESS BEGINS:
4 — LOGS AND OTHER DETAILS PROVIDED/ANALYZED
5 — MULTIPLE CALLS AND INFORMATION EXCHANGES
6 — FIELD ENGINEER SCHEDULED
7 — REPEAT CALL DUE TO SKILL OR PART
8 — FAULT RESOLVED, TICKET CLOSED

NEW WAY

1 — 2 — FAULT RESOLVED, TICKET CLOSED

PARKVIEW™ AUTOMATICALLY DISCOVERS THE FAULT, PERFORMS TRIAGE AND SCHEDULES MAINTENANCE.

Already, ParkView is helping clients reduce day-to-day maintenance costs and headaches and improving uptime amidst COVID-19. Looking forward, we expect to drive further advances in remote monitoring tools to help clients remotely operate data centers with little or no on-site staff for longer and longer periods of time.

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Conclusion

Planning for crisis data center monitoring and maintenance from the policy and staffing perspective through the entirety of the technology stack can seem like an overwhelming proposition. The right partnerships can transfer a significant proportion of the burden off the enterprise, helping to relieve immediate pressures and enhance overall preparedness. Providers combining smart hands services and innovative remote toolsets can make the difference between surviving a crisis like COVID-19 and thriving in this era of uncertainty.

About Park Place Technologies

Park Place Technologies, founded in 1991, simplifies the management of complex technology environments for more than 17,000 customers worldwide. We provide exceptional global service for data center storage, server and network hardware for all tier one OEM equipment. Our worldwide network of more than 400,000 parts stored regionally, locally and on-site allows for fast parts distribution and service to drive Uptime.

Park Place responded to customer input and created a new technology service category – Discover, Monitor, Support, Optimize (DMSO) – a fully integrated approach to managing critical infrastructure. Our industry-leading and award-winning services include ParkView™ Managed Services, Entuity software, and our Enterprise Operations Center.

With Park Place Technologies, customers are maximizing Uptime, improving operational speed, eliminating IT chaos, and boosting return on investment – ultimately accelerating their digital transformation.

Park Place supports 58,000+ data centers in 150+ countries.

For more information, visit us at ParkPlaceTechnologies.com.

References

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[ii] https://www.networkworld.com/article/3533408/covid-19-best-practices-for-data-center-operators.html

[iii] https://go.451research.com/2020-mi-coronavirus-quick-fixes-arent-scalable-business-leaders-must-rethink.html

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