

Citrix ADC for business continuity

Ensuring application performance
in a remote work world



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Unforeseen events and disruptions can impact organizations of any size in any location. Whatever the cause every organization needs to develop a business continuity plan to ensure its workforce and business operations are ready and able to flex quickly and continue to function in the face of any unplanned disruption or event.

There are many things that cause disruptions to businesses from the failure of localized components to global pandemics. All of them impact business operations and you must ensure that you act to mitigate the impact of each in your business continuity plan.

Much of this starts with workforce experience. Workforce experience is about providing a dynamic IT infrastructure and flexible work environment that empowers workforce to do their very best work – wherever and whenever work needs to get done. The experience needs to be "consumer simple" yet "enterprise secure". In the face of unplanned disruptions, a flexible workforce experience model ensures employees can work remotely, securely and reliably so business operations can continue to run smoothly.

Moreover, the trend towards remote working is being plainly manifested by the current COVID-19 pandemic. Such a large proportion of the workforce being remote places a real strain on application performance and IT infrastructure. The new battleground for continuity is

how you maintain application performance in the face of 100% of the workforce being remote. How will you ensure the applications are always available? How do you position workloads to minimize latency to the users? Are the resources resilient? Is the application secure always?

While every organization needs to provide a workforce experience that extends beyond a physical place and securely connects them to the data, apps and resources they need to keep moving the business forward, business continuity extends beyond workforce access. Similar consideration must also be given to the customer facing applications.

This paper will look at the pillars of business continuity that a business must address in order to maintain operations and discuss how Citrix Application Delivery Controller (ADC) and Citrix Application Delivery Management (ADM) can help your business address them.

5 Objectives of business continuity planning

At its most basic level the objectives for business continuity are to keep the essential functions up and running during a disruption and to recover with as little productivity loss as possible. A crisis impacts every part of an organization but workforce productivity and application availability are most affected. The goal of business continuity is to keep the workforce productive and engaged and the applications performant and ready to service your customers.

Figure 1: 5 Objectives of business continuity



There are five key objectives to business continuity for any organization:

- Ensure workforce productivity, application availability and end user experience
- Scale IT infrastructure during unforeseen demand
- Respond faster to restore the application performance
- Maintain visibility and control
- Remain secure and compliant always

Ensure workforce productivity, application availability, and experience

Applications are at the heart of everything a business does today so keeping them available and your workforce and customers engaged is vital. Workforce productivity is synonymous with application availability and end user experience. It doesn't matter how good an application is, if it's not available. This means having a plan to handle the loss of servers, applications, a data center or even a cloud. It also means making sure users and customers have suitable access and an excellent application experience so that you don't suffer lost productivity or lost customers. It is equally damaging to have an application available but not ensure low latency or high performance.

Scale it infrastructure during unforeseen demand

During an unforeseen event, application demand can fluctuate wildly and stress IT infrastructure. This can impact the employee experience. It can also directly impact the ability to transact business and potentially how customers perceive a business. There is a need to meet changes in demand seamlessly. This might require rapid scaling of resources. If you cannot auto scale your IT, then you can't scale your business. Conventional business continuity plans typically cater for some of the infrastructure and a portion of the workforce being remote, but with COVID-19, suddenly the need was to ensure smooth operations for a 100% remote workforce.

Respond faster to restore the ability to service customers

The ability to return to normal operations quickly is crucial for a business to continue to service its customers. The faster you restore productivity, the faster your business recovers. When your customers can't get what they need fast, they look for other options. There is a need to identify and remediate application and infrastructure issues quickly. During a disruption, there is frequently a requirement to shift critical IT workloads rapidly to other environments (on-prem to cloud; among clouds). Your business needs to be prepared. The ability to respond swiftly during a disruption differentiates leaders from laggards.

Maintain visibility and control

Being in control during a crisis brings stability and speeds the restoration of workforce productivity. If you cannot see it, you cannot fix it. It is critical to maintain visibility across user, application and infrastructure. Knowing what's wrong means that you can fix it faster. Frequently, however, tools for visibility are fragmented and it is difficult to get the right information in the hands of the right people in your organization.

Remain secure & compliant always

The security of a business and its applications is always crucial. During a crisis there must be extra vigilance because the business is already more vulnerable. Maintaining security prevents a crisis becoming a disaster and ensures a business is still trusted by its employees and customers. During an emergency, employees and data are more exposed to cyber threats as they frequently sit outside corporate entities. Applications themselves are more likely to be attacked by bad actors and bots can put additional stress on already strained resources. You need to find a way to address all of these elements in any business continuity planning you do. Citrix Application Delivery Controller (ADC) and Citrix Application Delivery Management (ADM) can help you to achieve objectives for business continuity. Let's discuss how.

If it's not performing, it doesn't matter how good an application is.

Ensure workforce productivity, application availability, and User experience

Application availability, performance and end user experience are intrinsically linked to remote workforce productivity and customer experience. During any unforeseen event, ensuring that your business apps are up and running are vital. After all - It doesn't matter how good an application is if it's not available.

From server failure and application failure through to data center and cloud issues, all manner of things can threaten your application availability and performance. Putting it right quickly is a priority. You also need to consider that sometimes, like during the current COVID-19 pandemic everyone is remote and you cannot just rack up a new server. This means you need to automate your resilience as much as possible. With Citrix ADC, you are well ahead of the curve in terms of making sure that you keep your business running. Citrix ADC helps mitigate multiple disruptions and performance issues. A few examples are:

Server failure

A server can fail at any time - or suffer performance issues. With Citrix server load balancing you will never be in a position of sending requests to failed servers. Citrix ADC keeps checking the health of the servers in the load balancing group - the physical health of the server, the underlying software and the network connectivity in the data center - if anything fails the ADC will send requests to an alternate server.

ADC high availability

An ADC node level failure is easily mitigated with Citrix ADC. Citrix ADC can be set up as a high availability (HA) pair - or better still - clustered for the ultimate in availability. With an active-passive pair, it is essential to check failover periodically in case configs have drifted out of sync. With clustering, things are active-active and therefore you know it works.

Data center failure and performance issues

From time to time, a data center (DC) may fail - perhaps a power outage - or suffer performance issues due to underperforming link. When this happens, it's reassuring to know that you can set up a backup DC that can take the load. With Citrix ADC's Global Server Load Balancing (GSLB) constantly monitoring the health of the DC and the servers in it, you can be confident that in the event of a failure traffic will automatically be diverted to the failover site.

Application failure and performance issues

Applications and their components can fail. When this happens Citrix ADC can send requests to alternate resources. Citrix ADC's intelligent health monitoring uses customizable checks that can be specific to an individual application and test it all the way through to determine if it is responding properly. If any part of it fails then the ADC can use different servers or divert requests to other sites for processing.

In case of application performance issues, Citrix ADM can help pin point the specific server instance which is slowing down and causing poor user experience. With the help of a ML engine, ADM is able to highlight response time anomalies and alert the admin to take corrective actions. This ensures that user experience does not deteriorate and you stay ahead of issues.

Network and internet issues

During disruptions, users and customers frequently have to traverse lower quality networks. For example, your branches might have fast connectivity, but your employees' home offices might be restricted to home broadband - or even 3G. Citrix ADC has a variety of optimization techniques that can help improve the delivery of your applications across difficult networks.

Compression can reduce the number of round trips to get content, caching can improve the speed of processing requests as cached objects can be delivered more quickly, various front-end content

If you can't autoscale your IT, you can't scale your business.

optimizations help the application render more quickly and there are various TCP protocol optimizations that help improve data transport from the application to the user in slow or congested networks. All of these combine to improve the application performance and hence the user experience.

Private cloud issues

If your private cloud where you host your applications - or for that matter the public cloud you currently use - has a failure, which they do, then you can shift to use another. Citrix ADC is available in all the major public clouds and you can shift your workloads from the failed cloud to AWS, Azure, or GCP. The single code base makes application delivery with Citrix ADC very portable and maintains operational consistency.

Whatever the reason for the failure of applications or their components, Citrix ADC helps you restore your business and the application experience for your workforce and your customers.

Scale IT infrastructure during unforeseen demand

Scaling out your IT infrastructure during unforeseen events can be the difference between success and failure. If you can't scale to meet demand then your remote employees can't be productive and your customers can't transact with you. Of course, both scenarios are bad and if you can't scale your IT automatically to cater for fluctuations in demand when they occur then it may be very difficult to scale your business effectively. When most of your workforce starts working from home, the demand on IT resources increases exponentially.

With Citrix ADC and Citrix ADM, your IT and business can scale very easily. Citrix makes it simple to scale infrastructure on demand, scale licenses to meet capacity and also ensures that you can monitor the demand and utilization of your application delivery infrastructure in real time.

On demand scale

Clustering: When it comes to scaling to meet traffic demands, nothing is better than Citrix ADC clustering. You can cluster up to 32 devices together to process a staggering 6.4 Tbps of throughput capacity. You can cluster across the entire portfolio - from the highest throughput hardware to the smallest virtual, VPX devices - so you can use this feature across the range to suit your business's needs.

Autoscale: Another important capability for Citrix ADC scale is Autoscale. With autoscale you can scale automatically in the cloud to meet new demand.

Back end Autoscale: When you need to scale back end resources - application servers - you can use cloud auto scale features like AWS Auto Scale, Azure Autoscale or Google Cloud Autoscale. Citrix ADC integrates with the auto scale feature on the major cloud providers such that when more servers are added they are automatically discovered and added to the application load balancing group.

Front end Autoscale: Similarly, as demand grows beyond defined thresholds for individual delivery controllers, this is detected and additional VPX instances are automatically provisioned, licensed, configured and added to your ADC cluster.

On demand licensing

Pooled Capacity: Citrix employs the concept of pooled licensing to allow flexible migration of ADC capacity where it's needed. During a disruption it may very well be necessary to expand the throughput of an ADC device, or shift applications and the associated ADC, from on premises to cloud - or between clouds - to meet the demand. With Pooled Capacity Licensing this is as simple as clicking on a license and allocating it to an ADC instance.

Burst Licensing: Also, Citrix Licensing enables you to burst your throughput automatically to manage transient peaks in demand. You can burst up to 25% above your normal license and only pay for the period you exceed. It's all declared up front so there are no surprise costs associated with the burst.

Know the demand in real time

Monitoring your capacity in real time with Citrix ADM:

Citrix ADM collates and analyses data from your entire ADC fleet in real time and provides instant feedback in a single place. Intuitive dashboards let you see the system resources - CPU, RAM usage, data transfer etc. - on all your ADCs, across your entire multi cloud environment. Similarly, Citrix ADM's application dashboard gives a complete picture of the usage of each application. You can see how many requests are being made to each application, monitor the connections and the throughput as well as the total volume of data being sent with time. Citrix ADM will even track your SSL certificate expiration - a common cause of application failures - and alert administrators ahead of time. This way you can be sure your traffic always flows in a secure manner.

Citrix ADM recently added ML based predictive analytics features for ADC and Application infrastructure. With this feature, you understand the scaling needs ahead of time and can plan for it.

Scaling on demand is an important aspect of handling unexpected surges in demand and should factor highly in your considerations for business continuity. As should a holistic view of your infrastructure and applications.

Respond faster to restore application performance

Quite literally, the speed of response to a situation differentiates businesses that lead from the laggards. The faster you respond the faster you can recover and restore stability to your operations. This makes it possible to service your customers faster and can provide you with a competitive advantage.

Disruptions take many forms and businesses face different challenges to restore normality. It may be a need to quickly provide remote workers with access to their familiar applications. Or perhaps an application or infrastructure issue may need to be identified and remediated rapidly. You may even have a requirement to swiftly shift critical IT workloads to other environments (on-prem. to cloud; among clouds). Whatever the issue, Citrix ADC and Citrix ADM can help you address the situation act and recover your application performance quickly. A few Citrix capabilities are:

Be agile with operational consistency

Citrix ADC has a single code base across all its form factors and across all its public cloud images. This brings operational consistency and means that your ADC configurations are very portable which makes is very fast to deploy your applications in new places.

Automate deployment with Citrix ADM

Citrix ADM enables automation of your ADC configurations across your entire fleet of ADCs. During an unforeseen event you can make any necessary alterations to your ADC configurations and push them out *en masse*.

Citrix ADM also includes style books that enables you to shift workloads - and the associated ADC configurations - very quickly among environments with a few clicks. You can maintain the config rules and only need to change the environmental factors where they differ - IP addresses for example.

Find root causes faster with AI/ML

When something stops working, you need to find out why - and fast. Citrix ADM provides actionable analytics that help you see what's wrong. You can get application performance analytics for every application deployed behind the ADC. ADM helps you see

When your customer can't get what they need fast, they look for other options.

performance trends over time and take corrective actions. This is backed up with Artificial Intelligence and Machine learning techniques that can diagnose problems automatically and suggest remediations. This self-healing capability can get you back up and running much faster.

Flexible pooled licensing

Of course, when you shift workloads during an unforeseen event, you need to license things accordingly. With Citrix Pooled Capacity licensing you can move Citrix ADC capacity and functionality where you need it quickly. With all your licensing visible in a single place with Citrix ADM, you can control things with a few clicks and restore operations fast.

When your customers can't get what they need quickly, they look for other options so restoring normal operations quickly is vital to your business. Citrix ADC and ADM enable you to act faster to restore normal operations.

Maintain visibility and control

Being in control during a crisis brings stability and speeds the road to recovery. It is likely that a business needs to make changes, but uninformed changes might make a bad situation worse. This is why you need visibility and analytics. Knowing what's wrong in real time means that you can start to fix it faster. The problem is, however, that visibility tools are often fragmented and it is difficult to get the right information in the hands of the right people in your organization. Moreover, there is often too much data and a lack of clear, actionable information to enable informed decision making.

Citrix ADC and ADM bring you the right level of information in an easily consumable form so that that you can see issues before they become problems and act accordingly. Citrix ADM provides industry leading

telemetry and analytics about the condition of your applications and the app delivery infrastructure. This gives you with the visibility you need to stay in control of changing situations and keep the business going. Citrix ADM offers:

Single place to look

Citrix ADM provides a single pane of glass to manage your application delivery infrastructure. It offers actionable insight into the health and performance of your entire app delivery fleet across all your applications wherever they are deployed. This enables you to troubleshoot issues across multi cloud much faster.

All the information you need

Telemetry is collated from all aspects of your app delivery - the ADCs, the network, the applications and even the user experience. The data is processed and presented in intuitive dashboards that immediately highlight issues around the performance, health and security of your applications and licenses.

App Insight: Shows your applications and their usage. Simple composite health scores and color coding make it apparent when there are issues that need your attention.

Infrastructure Insight: Offer feedback on the conditions of your ADC estate - you can see quickly which are performing and which have issues or are struggling with performance.

Security Insight: Highlights the attacks on your systems in real time and maps out trends with time. It also highlights which applications are most under threat so you can prioritise your remediations.

User Experience: You can even track how your applications are being perceived by your users. This enables you to get ahead of issues and make changes - to the delivery infrastructure or the applications themselves.

You can't fix what you can't see.

Further, ADM insight is interactive, so you can drill into specific applications and issues to troubleshoot them - all from the same single pane of glass. Having all this information at your fingertips make it easy to spot when disruptions occur and fix them. This puts you in control completely.

Role-based and customized dashboards

With Citrix ADM You have the flexibility to set things up to fit your organizational structure. You can separate out the tasks of the security and networking teams. If applications are owned by different groups, divide them accordingly. If some groups need read only access, you can define it. While completely customizable to suit your organization, typical dashboards include:

- IT operations - with a view of everything
- Security operation - security focused information
- Application owners - showing application information specific to each application owner

With role-based dashboards you can put the right information in front of the right people at the right time. Keeping the information relevant helps aid decision making during a disruption.

Augmented decision making with AI and ML

And to help that decision-making Citrix ADM uses AI and ML techniques to augment data analysis. Citrix ADM will automatically learn the normal levels of performance for your individual applications based on historic trends and then alert you when things change. This makes it faster and easier to spot issues and you can start troubleshooting, find the root causes and begin remediation sooner.

All these things together bring you the visibility and control you require to get your business back up and running at full capacity more quickly.

Remain secure and compliant always

The security of a business and its applications is always crucial, but during a disruption extra vigilance is required because the business is already more vulnerable. Maintaining security and keeping it compliant with your normal practices prevents a crisis becoming a disaster and ensures your business is still trusted by its employees and customers.

Unforeseen events are an open door for breaches as bad actors seek to take advantage of the situation and hope that your focus is elsewhere. Not only are your applications under increased threat but bot traffic can put additional stress on your already strained resources.

Similarly, during an emergency most of your workforce may work from home. Being outside the corporate environment, and often using non-corporate devices, they are more exposed to malware and cyberthreats that can endanger your business and risk customer's trust. You need to take these things into consideration in any business continuity planning that you make for your organization. With Citrix ADC and ADM you can rest assured that you remain protected during disrupted times. Citrix ADC and ADM offer:

Secure, contextual remote access to all your apps

Your first priority is to get your workforce back to productivity. This sometimes means your workforce working from home or some other convenient place. You have to provide remote access and you must do it securely.

Citrix ADC offers secure, contextual remote access capabilities for all your applications built in.

You are more vulnerable to cyberattacks during unforeseen events.

Access to Citrix virtual apps and desktop is secured via ICA Proxy. Clientless and Full SSL VPN capability is integrated into every Citrix ADC device and can be used to access web, Mobile and SaaS applications from any device.

Full end-point analysis (EPA) is available to inspect devices for compliance with your security standards both before and after authentication and periodically throughout the session. This ensures that your users can be given access to applications while protecting applications and other users from cyber threats.

Citrix ADC has a fully-fledged AAA module built in to handle authentication, authorisation and accounting of users and their actions when they access applications. With Citrix nFactor you can even build variable authentication policies that are contextual to the access. For example, if a user is coming in from a corporate office you might only need to request user name and password. If they are accessing from outside then you may want to add other methods of authentication like a one-time password.

Always-on, holistic and layered protection for apps

Citrix ADC adopts a holistic and layered approach to application security. The Citrix ADC offers comprehensive protection from attacks at L3 to L7 for all your applications - monolithic and microservices-based alike. A variety of techniques such as Access control lists; best price-performance WAF, bot mitigation, API protection, best-in-class SSL/TLS encryption performance and deep analytics all serve to bring you holistic protection that will secure your applications during an unforeseen event as well as during normal operations.

Consistent security posture across multi-cloud

It's vital that your business works with a consistent security posture across their deployments. When you have to migrate workloads to a new cloud during a disruption, you need to keep it secure.

A single code base across the Citrix ADC portfolio brings operational consistency to all form factors and across all the public cloud deployments. This means that security policies are portable and you can ensure a consistent security posture across your applications wherever you need to deploy them even during a disruption. With Citrix all of the security policies can be deployed and controlled from a single pane of glass in the cloud. So it is always accessible and available.

Built for governance and compliance

Citrix ADC and ADM not only ensure that you can maintain a consistent security posture, but also be seen to. The comprehensive visibility available from Citrix ADM enables you to prove that you are in line with your corporate policies always.

Citrix ADM will alert you to any config drifts automatically - including those that might violate security policies. For example, through Citrix ADM's SSL/TLS dashboard you can define what SSL protocols, ciphers, key strengths, certificate issuers etc. are acceptable for your deployments and then enforce and monitor this against application access. This ensures that during any unforeseen event when you need to set things up quickly your administrators can't accidentally leave a hole in your security posture through which bad actors can come in, or sensitive data can escape.

Citrix ADC has this functionality across its entire ADC portfolio and clouds to help you meet your security needs. There is even a range of Citrix ADC FIPS certified devices (physical and virtual) to ensure you remain compliant with your security requirements. The single platform approach with a single license (Premium) to enable all this functionality means that you can always be confident that your applications and infrastructure is protected during any business disruption episode.

The right solutions to keep the business going during disruptions

Business continuity is about keeping things going when unforeseen events happen. Citrix understands the things that are important to keeping your business functioning – Availability, Scale, Speed, Control and Compliance, and how it relates to workforce productivity, customer experience and business governance. Citrix ADC help you to meet the business goals and objectives so that when a crisis hits you can:

- Give your workforce secure access to the applications
- Ensure your applications are always available
- Ensure your application performance
- Scale your infrastructure and applications automatically to meet demand
- Respond quickly to changes
- Provide the visibility to ensure you remain in control
- Remain secure and compliant

To learn more, visit

<https://www.citrix.com/products/citrix-adc/>.



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