NiCE

NiCE CXone
High availability & disaster recovery

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Overview

This white paper provides a comprehensive overview of NiCE CXone's High Availability (HA) policies and procedures, highlighting the critical distinction between HA and the Disaster Recovery Plan (DRP).

High Availability is intricately linked to the company's architecture, encompassing service deployment, microservices, service providers, and system maintenance. It encompasses all measures taken to ensure platform performance, fault tolerance, operational redundancy, and uptime. NiCE CXone's deployment across multiple public clouds, regions, and availability zones ensures resilience at every level, with the primary goal of shielding customers from failures. NiCE CXone's High Availability is financially backed by a robust 99.99% SLA, supported by controls and architecture that uphold this commitment. For instance, the operation in multiple data centers/regions is designed to transparently manage and mitigate the impact of a single data center/region failure.

In contrast, Disaster Recovery addresses an organization's capability to respond to unplanned and potentially prolonged disruptions that surpass the built-in high-availability design. Scenarios such as the destruction of multiple data centers/regions due to natural or human-induced disasters or the failure of an entire Cloud Service Provider (CSP) region are considered disasters. NiCE CXone relies on a meticulously tested Disaster Recovery Plan to swiftly stabilize and restore critical functions in the event of such disasters. Recognizing the unpredictable nature of these events, the steps taken in the Disaster Recovery process are reactionary, adapting to the specific type and scope of the disaster. Subsequent sections of this white paper will delve into more specific details on both High Availability and Disaster Recovery aspects.

High availability

NiCE CXone adopts a proactive approach to safeguard against availability failures by meticulously mapping out potential risks. The architecture and controls employed by NiCE CXone form the foundation for a robust 99.99% availability service level agreement (SLA), backed by financial assurances. The platform integrates layers of redundancy, encompassing redundant network, server, and application design, monitoring systems, multiple carriers and vendors, and redundant services. This redundancy extends across the infrastructure, leveraging multiple service providers, availability zones, and regions. Regularly tested failovers ensure the operational processes and components maintain redundancy, with these tests conducted at least quarterly.

Data High Availability is a priority, necessitating redundant storage of customer data, with critical considerations given to database structure and replication. NiCE CXone's Voice Points of Presence (POPs) are strategically distributed, incorporating intelligent, omnichannel technology for enhanced protection. The High Availability planning extends to safeguarding against potential losses of systems, data, and utilities. The computer and data networks are secured, redundant, and scalable through careful architectural design, and service provider choices. Customer data integrity is ensured through redundant databases, real-time replication, data encryption at rest, HTTPS, SFTP, Secure Data Transfer, and high-performance storage systems.

NiCE CXone maintains a vigilant stance against internal and external threats, subjecting its systems to regular third-party vulnerability and penetration tests. Intrusion detection and protection technologies are seamlessly integrated into routers, firewalls, and switches. The infrastructure undergoes continuous monitoring, with alerts via visual, audible, and email channels. Regionalized Latency Reduction (RLR) servers contribute to maintaining optimal platform performance and meeting SLA uptime.

As a registered telecom carrier in all 50 US states and most of Europe, NiCE CXone boasts a global presence with 27 physical Points of Presence (POPs) across nine countries on five continents. Leveraging over 30 carriers worldwide, NiCE CXone ensures unparalleled redundancy and resiliency while managing carriers and telecom vendors on behalf of customers. The global voice network supports calling to over 200 countries, surpassing major competitors like AT&T or Verizon. NiCE CXone's telecom and connectivity products excel in features and functionality, available in all 200+ countries through its global, meshed network. Innovations include pioneering solutions in Call Branding/Reputation Management and the use of WebRTC for seamless browser-based calling and application development.

Voice

NiCE CXone maintains redundancy for its Voice Points of Presence (POPs), housing them in carrier-grade data centers and regions for private cloud services and leveraging AWS cloud services for the public cloud. Mission-critical data is replicated based on specific data requirements. To validate operational readiness, walkthroughs and failover drills of background processes occur at least quarterly.

In the United States, NiCE CXone functions as a comprehensive telecommunications company, offering a spectrum of services alongside its role as a SaaS solutions provider. These services encompass Toll-Free, Dedicated, VoIP, Long Distance, and Local DID services. The NiCE CXone telecommunications network, with its omnichannel capabilities, partners with leading global service providers to establish a redundant and scalable digital network. This network is designed to meet the diverse demands of call contact, analytics, and channel management across small, medium, and large contact centers. NiCE CXone employs MOS (Mean Opinion Score) to assess the overall voice quality of calls and strategically utilizes multiple availability zones to ensure the High Availability of all voice services. This multifaceted approach underscores NiCE CXone's commitment to delivering reliable and high-quality telecommunications solutions.

AWS

Amazon Web Services (AWS) offers multiple zones for failover, and NiCE CXone strategically capitalizes on this by incorporating redundancy through the utilization of multiple availability zones. This redundancy extends to storage systems, ensuring a robust and fail-safe infrastructure. The systems are architected as "active-active", meaning they operate in parallel, and are engineered for real-time failover. In the event of a failure, the remaining servers seamlessly take over the entire processing load, emphasizing a continuous and uninterrupted service delivery. This design underscores the commitment to high availability and resilience within the NiCE CXone infrastructure.

Omnichannel

The utmost emphasis within NiCE CXone lies on digital Omnichannel systems, which encompass all the necessary components to facilitate the processing of customer interactions. These systems are meticulously designed to ensure virtually instantaneous failovers. Given that customer interactions may involve voice channels, it is imperative that, even in the occurrence of a High Availability failure, a voice interaction or call remains uninterrupted and is never dropped. This unwavering commitment to seamless continuity underscores the critical importance placed on delivering uninterrupted and high-quality customer communication experiences within the NiCE CXone infrastructure.
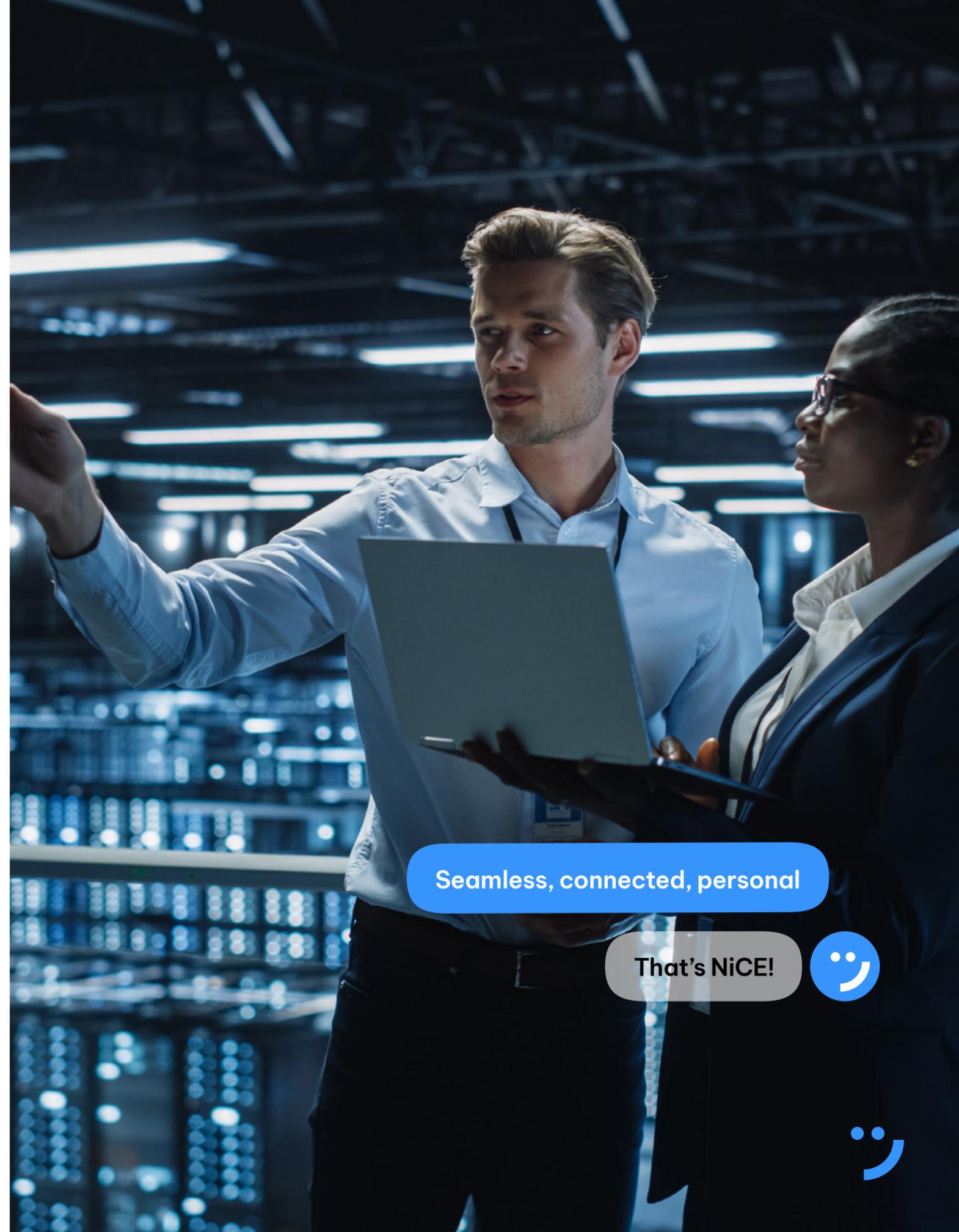
Seamless, connected, personal

That's NiCE!

Microservices

A substantial portion of NiCE CXone's services operate on a microservice architecture, a design that is systematically evaluated to confirm the system's ability to detect and respond to microservice failures. These services are structured to leverage multiple availability zones within each region, ensuring continued operation even in the event of a failure in a single AWS availability zone.

To enhance resiliency and High Availability, NiCE CXone employs the blue/green deployment methodology, maintaining multiple separate yet identical environments. Additionally, auto-scaling mechanisms are employed to dynamically adjust resource capacity based on demand. This strategic combination of microservices, blue/green deployment, and auto-scaling not only fortifies resiliency, but also facilitates the deployment of new functionality through "hot updates" every three weeks. NiCE CXone utilizes feature toggles in cumulative updates to deploy microservices and their functionalities seamlessly, contributing to a flexible and robust software development and deployment process.

Global services

Furthermore, NiCE CXone's microservices are implemented on a global scale, strategically utilizing multiple availability zones across various regions. This global deployment strategy is designed to provide the highest level of resilience, ensuring that these services persistently operate even in the face of failures across multiple AWS regions. This approach underscores the commitment to a robust and geographically distributed infrastructure, enhancing the overall reliability and continuity of NiCE CXone's services on a global scale.

Regional Services

Regional Services are different from Availability Zones (AZ) in that they operate at the broader regional level rather than within a single, isolated data-center zone. While Availability Zones are designed to provide fault isolation and high availability within a region, regional services are deployed across multiple AZs simultaneously and function as shared, region-wide resources. They deliver resilient, scalable functionality that remains available even if an individual AZ experiences an outage.
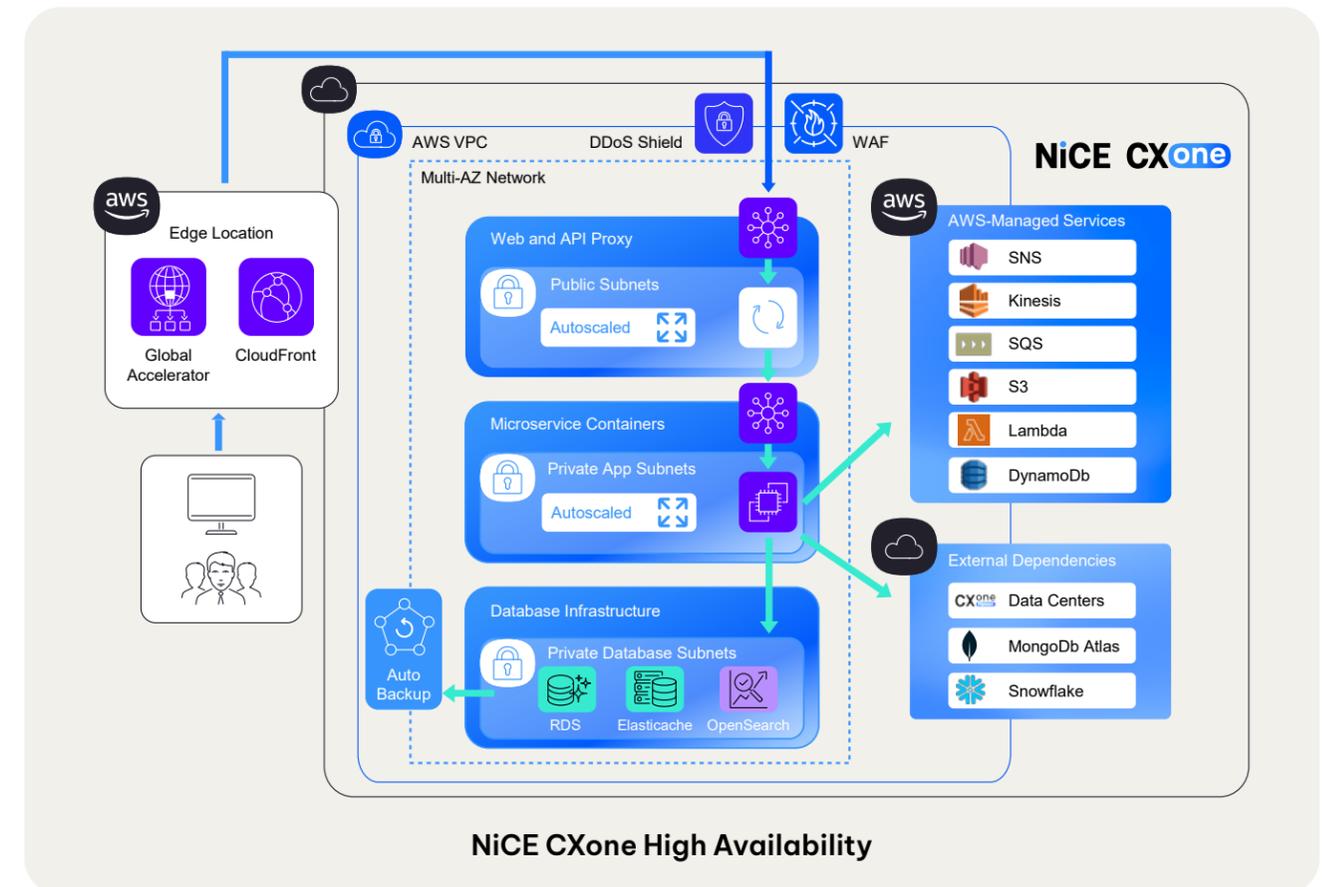
Data

The term "Data" within the context of NiCE CXone encompasses both customer data access and data durability, addressing concerns related to data loss. As an illustration, Amazon sets a financially backed 99.99% availability service level agreement for data objects, ensuring accessibility, and an exceptional 99.999999999% durability to safeguard against data loss. Additionally, NiCE CXone offers the flexibility to support data storage in a customer's preferred region or cloud environment. This option not only enhances uptime but also enables data sovereignty, providing customers with greater control and compliance with regional data regulations

Monitoring / event management

High Availability events, whether internal or external, are diligently managed by the NiCE CXone Network Operations Center (NOC), operating with proactive oversight 24/7/365. The NOC ensures the continuous efficiency, flexibility, and scalability of NiCE CXone's robust High Availability model. Engineered with resilience and extensive failover capabilities at every layer, this model is designed to guarantee consistent and reliable availability of NiCE CXone services.

High Availability considerations extend across various aspects of NiCE CXone, influencing deployment, security, and delivery processes. The monitoring scope encompasses cloud services, data services, computer networks, storage systems, applications, reporting systems, telecom, software, and network systems. Regular maintenance and patching activities include testing routes that redirect contact processing from one Voice Point of Presence (POP) to another, effectively validating redundancy and ensuring the continued reliability of the system. This comprehensive approach reflects NiCE CXone's commitment to maintaining uninterrupted service and a high level of availability for its users.

NiCE CXone High Availability

Region

WAF

Availability zone	Availability zone	Availability zone
Firewall / DDoS	Firewall / DDoS	Firewall / DDoS
API Proxy	API Proxy	API Proxy
Private Subnet	Private Subnet	Private Subnet
Load Balancer	Load Balancer	Load Balancer
Active/Active Micro-services	Active/Active Micro-services	Active/Active Micro-services
Active / Active, Scalable Database	Active / Active, Scalable Database	Active / Active, Scalable Database
Persistent Data Streams	Persistent Data Streams	Persistent Data Streams

Disaster recovery

The NiCE CXone Disaster Recovery (DR) Plan is an all-encompassing strategy covering both corporate and production environments and personnel. Deployed in multiple AWS regions, NiCE CXone follows best practices, utilizing multiple availability zones to mitigate the impact of natural or human-induced disasters. Regular walkthroughs and failover drills of operational processes ensure preparedness at planned intervals.

Recognizing the critical role of contact centers during disruptions, NiCE CXone offers enterprise-level scalability for swift responses to various situations. The commitment to business continuity involves comprehensive contingency planning, covering analysis, response, activation, notification, recovery, and reconstitution. The DR Plan serves as a framework for constructing specific plans within business and IT operations domains, ensuring service resumption regardless of the event's nature.

Unlike High Availability (HA) events handled internally, DR events impact customers and are managed by the NiCE CXone Network Operations Center (NOC). The NOC, operating proactively 24/7/365, is supplemented by additional on-call staffing for critical functions during disasters.

In the event of customer-impacting events, executives decide when to activate the DR Plan. The Incident Response and Recovery Team (IRRT), led by the CTO, coordinates tasks such as determining the event's scope, identifying affected customers, notifying them, and initiating service restoration. The IRRT, comprising representatives from various teams, stays intact until full restoration is achieved. Monthly testing of High Availability and Disaster Recovery microservices, along with comprehensive walkthroughs during software releases, ensures ongoing resilience.

Recovery Time Objective (RTO) and Recovery Point Objective (RPO) are determined as part of the evaluation and restoration process, with variables such as severity, affected region, and number of customers affected considered. NiCE's goal is zero downtime and zero data loss.

Our NiCE Business Continuity service is designed to keep your operations running, no matter what. In the rare event of a regional disruption, a pre-determined alternate region is activated and available immediately.

Offered as an added safeguard, this service ensures your teams and customers continue working without interruption.

Leveraging failover zones and implementing storage API servers in multiple availability zones ensures redundancy and real-time failover for both cloud-based and on-premises systems. This approach is how NiCE CXone ensures high availability, reliability, and rapid recovery in the face of unforeseen events.

Conclusion

- **High Availability Assurance:** NiCE CXone's High Availability framework is meticulously crafted to cater to the day-to-day operational needs of customers. The architecture is robust, protecting against availability failures with a financially backed 99.99% availability service level agreement (SLA). The infrastructure operates on a foundation of redundancy, ensuring continuous availability. NiCE CXone is committed to delivering a service that is consistently accessible to meet the demands of its users.

- **Disaster Recovery Preparedness:** While disasters are infrequent and diverse in nature, NiCE CXone has established comprehensive processes to swiftly restore services in such events. The deployment in multiple AWS regions, coupled with adherence to best practices regarding multiple availability zones, minimizes the impact of disasters. The Incident Response and Recovery Team (IRRT) is activated to promptly restore services for all customers, employing a strategic approach to mitigate downtime and ensure rapid recovery.

- **Tailored Solutions for RTO Goals:** Recovery Time Objective (RTO) and Recovery Point Objective (RPO) are determined as part of the evaluation and restoration process, with variables such as severity, affected region, and number of customers affected considered. NiCE's goal is zero downtime and zero data loss.

About NiCE

NiCE is transforming the world with AI that puts people first. Our purpose-built AI-powered platforms automate engagements into proactive, safe, intelligent actions, empowering individuals and organizations to innovate and act, from interaction to resolution. Trusted by organizations throughout 150+ countries worldwide, NiCE's platforms are widely adopted across industries connecting people, systems, and workflows to work smarter at scale, elevating performance across the organization, delivering proven measurable outcomes.

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