



# IT Infrastructure Disaster Avoidance and Resiliency

## Resilient Infrastructure



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## RESILIENT IT INFRASTRUCTURE

Design and implement a resilient IT infrastructure (private cloud), serving workload from multiple data centers to protect against disaster.

01

## CORE TO EDGE

A digital workspace that extends resiliency from the core to the edge, allowing employees to access services from any device, anywhere, at anytime.

02

## LEADING SOLUTION

Integrated a number of leading technologies, while taking advantage of the company's leading position being a virtualization worldwide pioneer.

03

## INNOVATIVE

Multi-technologies solution to deliver an intelligent and efficient data replication, failover, and run an ongoing automated recovery testing.

04

## GREEN & SUSTAINABLE

A software-defined solution that utilize energy-efficient hardware technologies, while taking advantage of software to maximize efficiency.

05

## IMPROVED RPO/RTO

Reduction in the recovery time objective from 24+ hours to 3 minutes and the recovery point objective from 24 hours to 0 seconds.

06

## DIGITALIZED

Critical business processes



## ONLINE & ELECTRONIC

Most active customer interaction channel

## 100,000\$+ PER HOUR

Estimated cost of downtime



## HW/SW, NATURAL DISASTERS

Primary cause of failure



## ACCESSIBILITY

Ensure that all digital services consumed by internal business processes owners and external customers are highly available.



## PRIVACY & INTEGRITY

Ensure full data privacy and integrity against any possible malicious activity, including cyber security threats.



## RAPID RESPONSE

Reduce downtime to the maximum possible in the event of disasters by focusing on the most effective recovery solution.

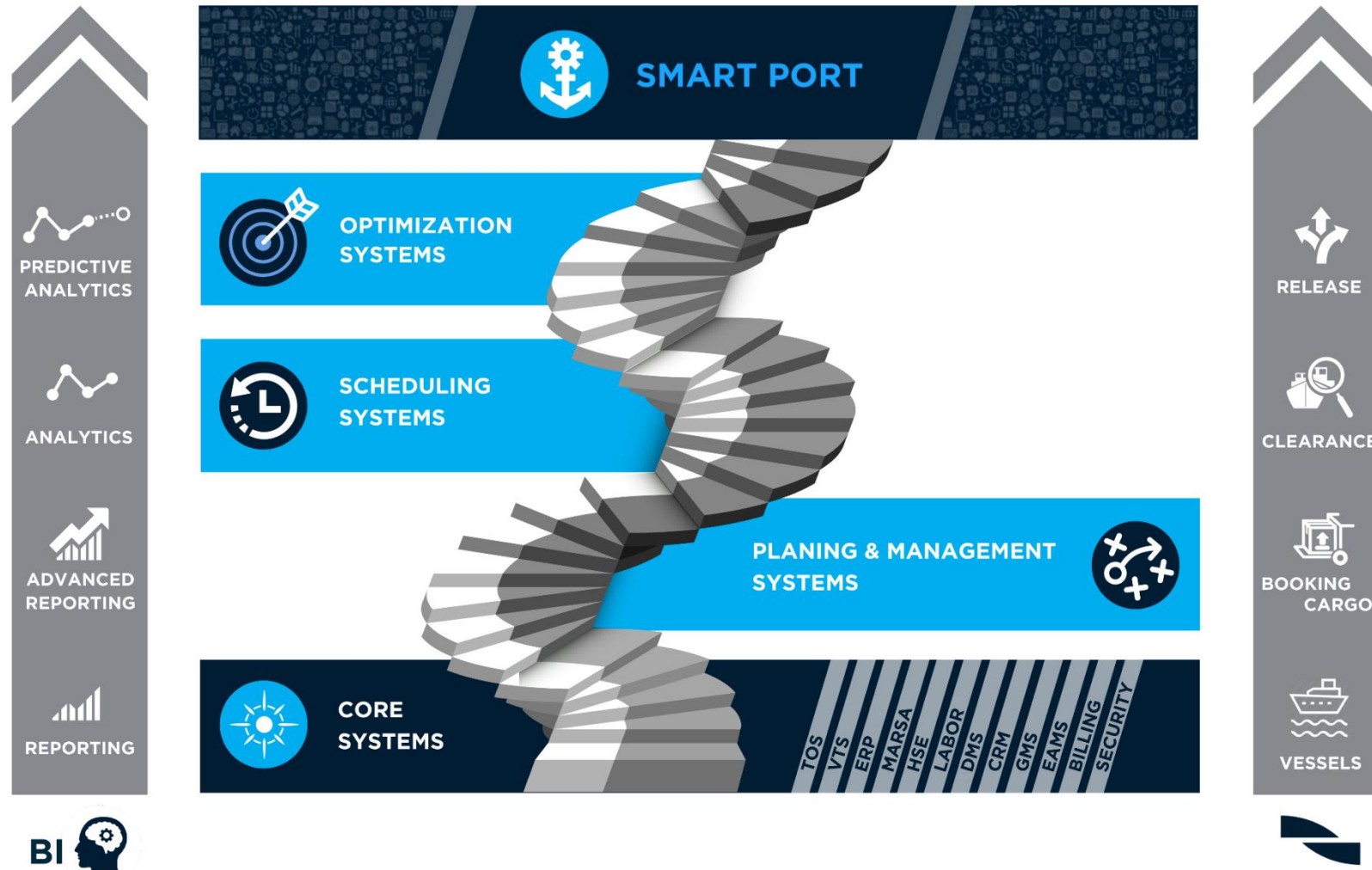


## COMPLIANCE

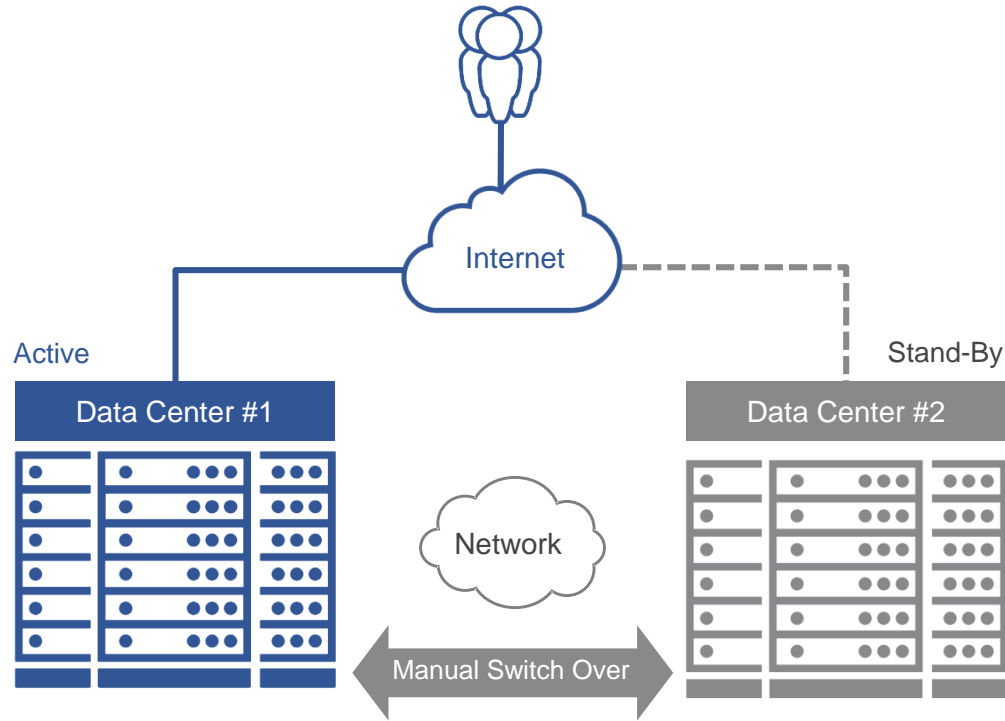
Full compliance with the local regulations and the ISO 22301 Societal security – Business continuity management systems.

- Design and implement an innovative and integrated resilient IT infrastructure that protects the company's digital assets from both human-made and natural disasters. The main drivers of this initiative are: the increased dependency on the IT-based services, the major impact of services disruption on the company (operational, financial, and reputational), and to have a robust infrastructure hosting the IT's smart port program platform, the port community system, and the rest of the digital services.
- Abu Dhabi Ports was one of the leading companies worldwide that achieved a 100% virtualization rate of its computes workload, including mission-critical applications. The goal was to leverage this success and have a state-of-the-art solution that is future proof, modern, scalable, converged and agile to achieve the defined objectives.
- A new data center that is geographically nearby the primary data center has been built to take advantages of the maximum possible bandwidth speed that dark fiber optics technology could deliver. A third data center (designed as a cold site) was also positioned to ignite in case of a major natural disaster that could affect both primary and the backup locations.
- The scope of the initiative was not limited to the backend (data centers) only, it was also extended as part of the digital transformation to the workforce. Employees were empowered with a simple and secure enterprise digital workspace platform that delivers corporate applications and collaboration tools on any device, anywhere, at anytime.
- Traditionally, active/active infrastructure resiliency setups are complex and expensive to implement. What Abu Dhabi Ports implemented is an integrated and innovative stretched cluster solution that does not only serve as a disaster recovery solution but as a disaster avoidance and resiliency. As a result, a proactive approach of dealing with disaster becomes possible, also increases the resources utilization, eliminates wasted resources, and allow for automated testing of the recovery process.

# Information Technology Roadmap



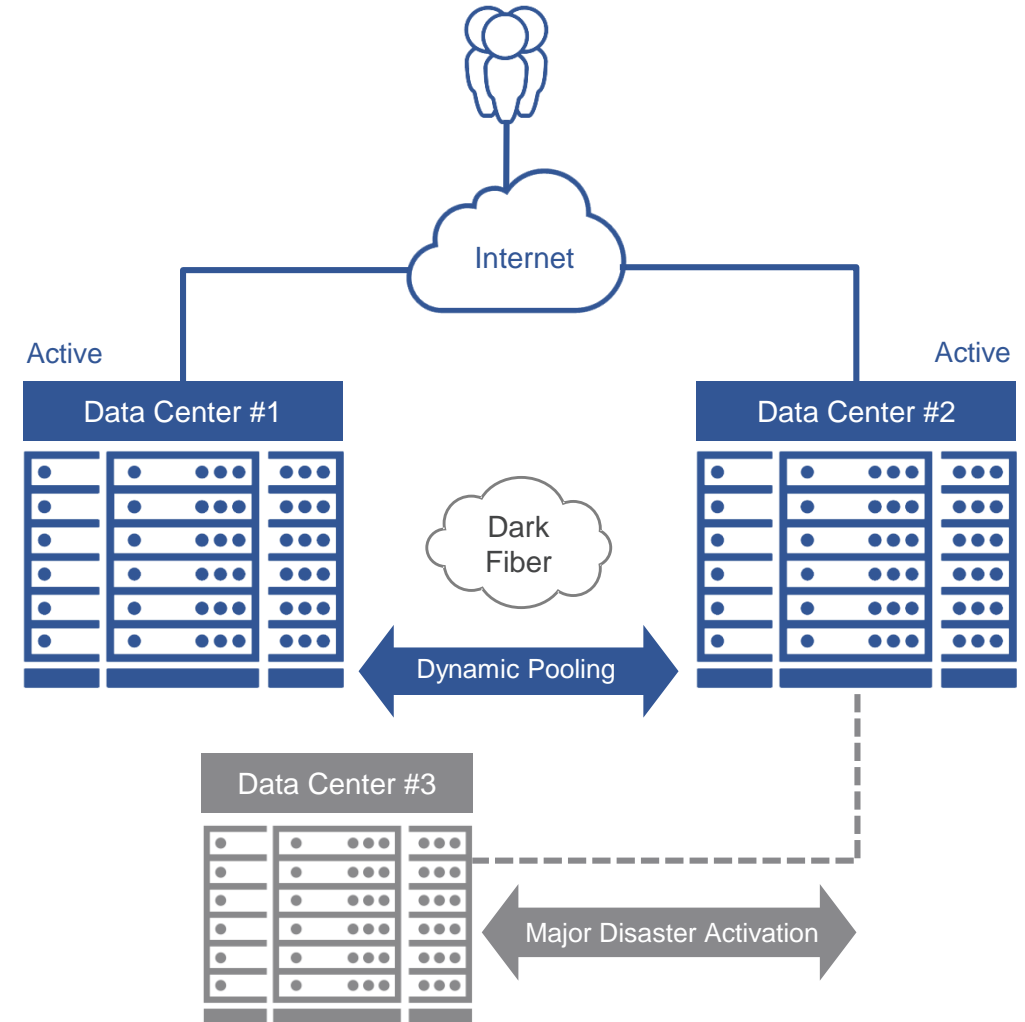
# Solution Design (Pre- and Post-Implementation)



PRE-IMPLEMENTATION



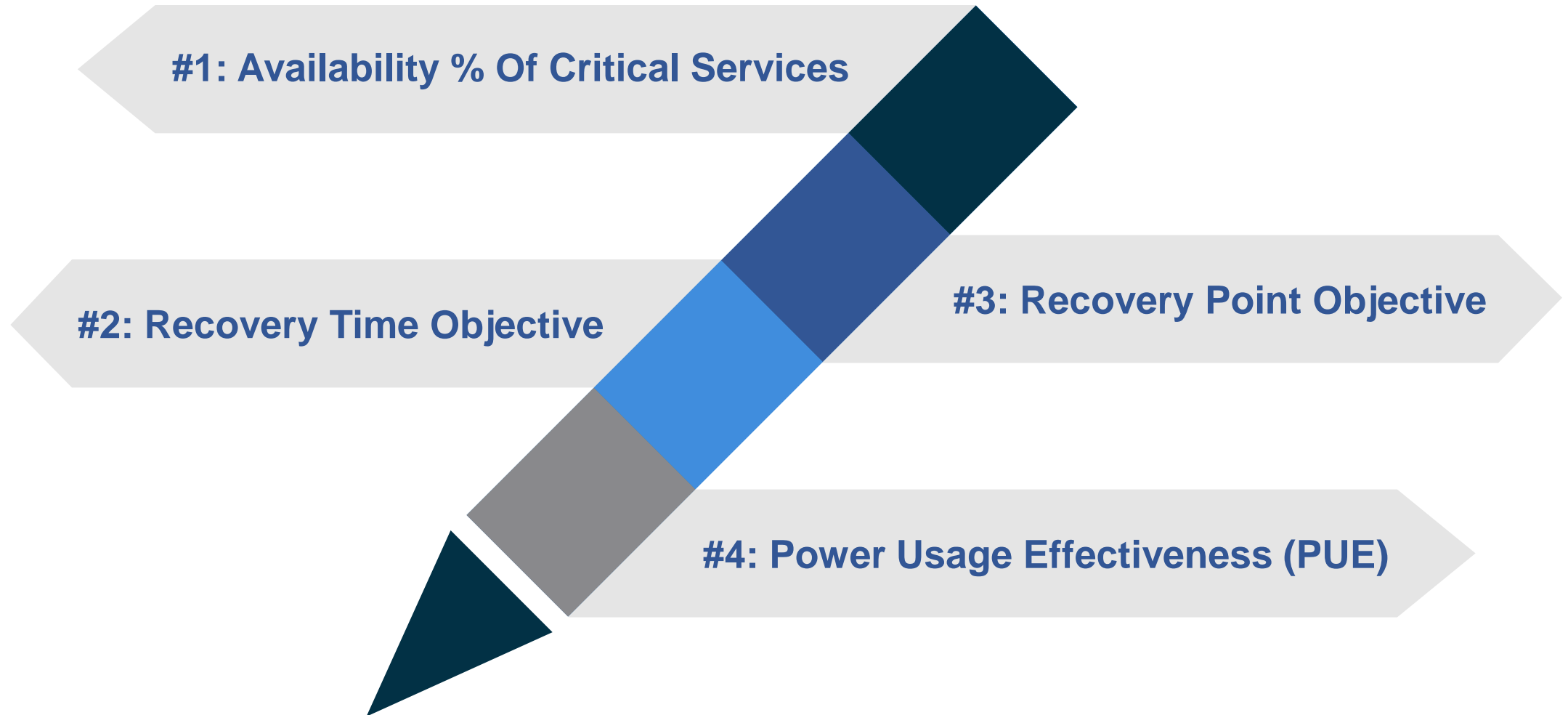
POST-IMPLEMENTATION



Previously, all critical workload were running from a single data center with a daily replication to a secondary data center. During outages, business would suffer from disruption which may take up to 24 hours to restore.



# Key Performance Indicators



## Customers & Stakeholders



The direct stakeholder of this project is the Emergencies, Crises and disasters management team from the executive council of the Emirate of Abu Dhabi. The stakeholder role was more of an authoritative role and a standard-setting body.

## FRESH AIR COOLING

Use of Fresh Air cooling hardware which helps save operational expenditures and lower your power usage effectiveness (PUE) number.



## ELIMINATED WASTE

A third data center in powered off state to eliminate wasted power usage. Initiated only when required.



## RECYCLE TIME

Increased lifecycle of IT equipment in data centers from 3 to 7 years by standardizing on a reliable and resilient open architecture platforms.



## 100% VIRTUALIZED

Reduction of footprint by achieving a 100% virtualization rate for all compute workload.



# Original & Innovative Character



## **AUTOMATED**

Eliminated the human factor in disaster situation and the need to run technology-based drills by having an automated resources balancing between data centers.



## **OPTIMIZED**

Eliminated the high cost of recurring connectivity between data centers by leveraging company-owned fiber optics.



## **EFFICIENT**

Utilization of smart technology such as deduplication and compression on all storage layers which reduced the actual storage capacity and replication bandwidth by over 10x.



## **SIMPLIFIED**

Reduced complexity radically by having a single and unified disaster avoidance process for all digital services.



## UNIFIED

A Single recovery methodology



## SCALABLE

Ability to increase number of services without design change/cost impact



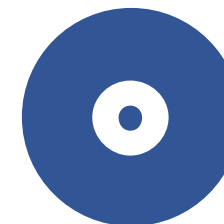
## AWARD-WINNING

Won 2 regional awards



## RTO

Minimize the RTO from 24+ hours to 180 seconds



## RPO

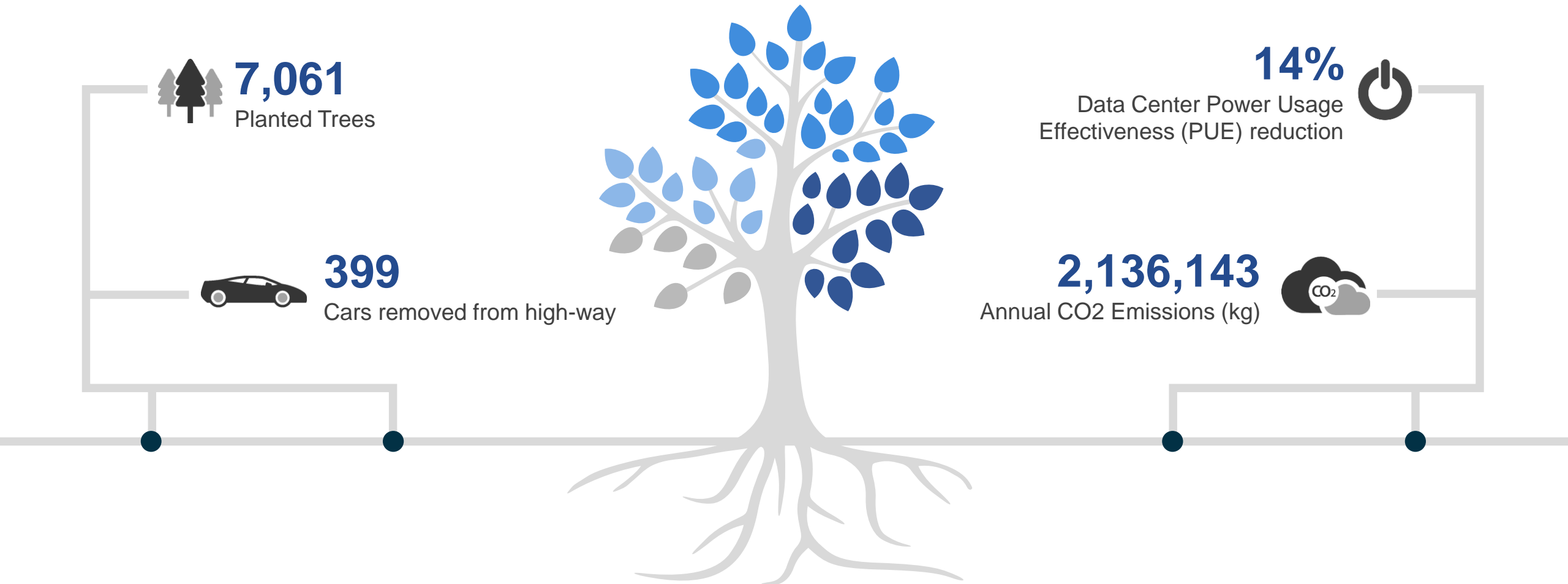
Reduce RPO from 24 hours to 0 seconds



## ISO 22301

Design & architecture played a key role in ISO certification

# Sustainability Results



**THANK YOU**

