

# Advanced High Availability Architecture

Delivering performance, scalability, and  
availability with the ServiceNow AI Platform

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# Introduction

This document provides an overview of the ServiceNow® Advanced High Availability (AHA) architecture – a key element in delivering an enterprise-grade cloud service.

Organizations rely on access to IT, business data, and services for their continued operation and success. The ServiceNow multi-instance architecture meets and exceeds stringent requirements surrounding data sovereignty, availability, and performance.

This document is designed to be read alongside [Securing the ServiceNow AI Platform](#) which gives a holistic overview of the physical, administrative, and technical controls ServiceNow has in place to protect customer data.



[Video: ServiceNow Availability and Resilience](#)

*Note: All information in this white paper relates to the **standard ServiceNow Commercial Cloud**.*

*For information related to other globally located ServiceNow in-country cloud offerings and how these offerings may differ, please contact your ServiceNow account representative.*



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## Advanced High Availability overview

*Note: All information in this white paper is related to the **standard ServiceNow Commercial Cloud**.*

ServiceNow colocation facilities and cloud-based infrastructure are designed to be highly available, with redundant components and multiple network paths to avoid single points of failure.

At the heart of this architecture, each customer application instance is supported by a multi-homed network configuration, with multiple connections to the Internet from different providers and redundant power sources.

ServiceNow colocation facilities are arranged in pairs, with all customer production data hosted in both colocation facilities simultaneously. These pairs are kept in sync using asynchronous database replication.

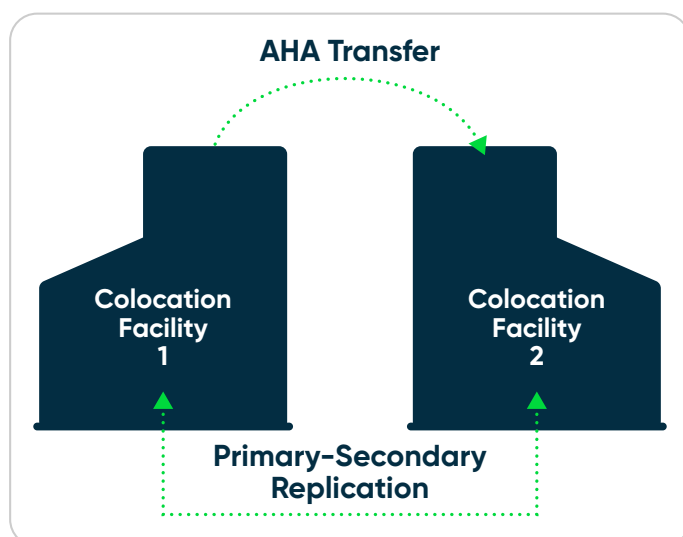
Both colocation facilities are always active in a main-main relationship, with data replicated from the active (read-write) colocation facility to the passive (read-only) colocation facility.

Within each regional colocation facility pair, there is no concept of a fixed primary location; each single colocation facility (in a pair) is implemented to support the combined production load of both locations.

ServiceNow leverages this Advanced High Availability (AHA) architecture for customer production instances for the following purposes:

- Prior to executing maintenance, ServiceNow can proactively transfer operation of a customer instance from one colocation facility to the other. The maintenance can then proceed without impacting service availability.
- In the unlikely event of the failure of one or more infrastructure components, service is restored by transferring the operation of the affected instance to the other colocation facility.

With this approach, the transfer between active and standby colocation facilities is regularly executed as part of ServiceNow standard operating procedures. This ensures that when AHA is needed to address a failure, the transfer will be successful and service disruption is minimized.



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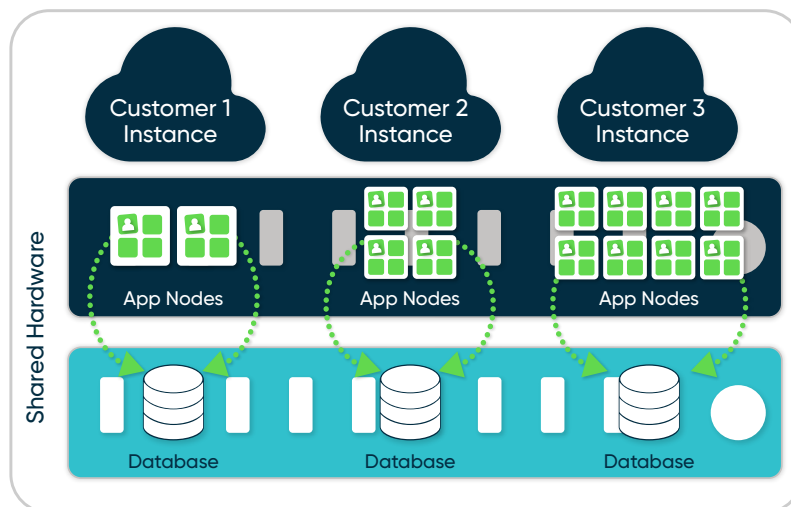
Instances of the ServiceNow AI Platform are deployed on an advanced, multi-instance architecture that provides separate application nodes and database processes for each customer.

## Multi-instance architecture

Instances of the ServiceNow AI Platform are deployed on an advanced, multi-instance architecture that provides separate application nodes and database processes for each customer.

This cloud infrastructure ensures that one customer's data is processed separately from others and that any maintenance carried out on one customer's instance does not impact any other customer.

Because each ServiceNow AI Platform instance runs its own application logic and database processes, customers do not have to be on the same version or upgraded at the same time as other customers' instances. Therefore, customers can upgrade their instances on a schedule that best meets their needs and compliance requirements. No downtime is necessary for upgrades.



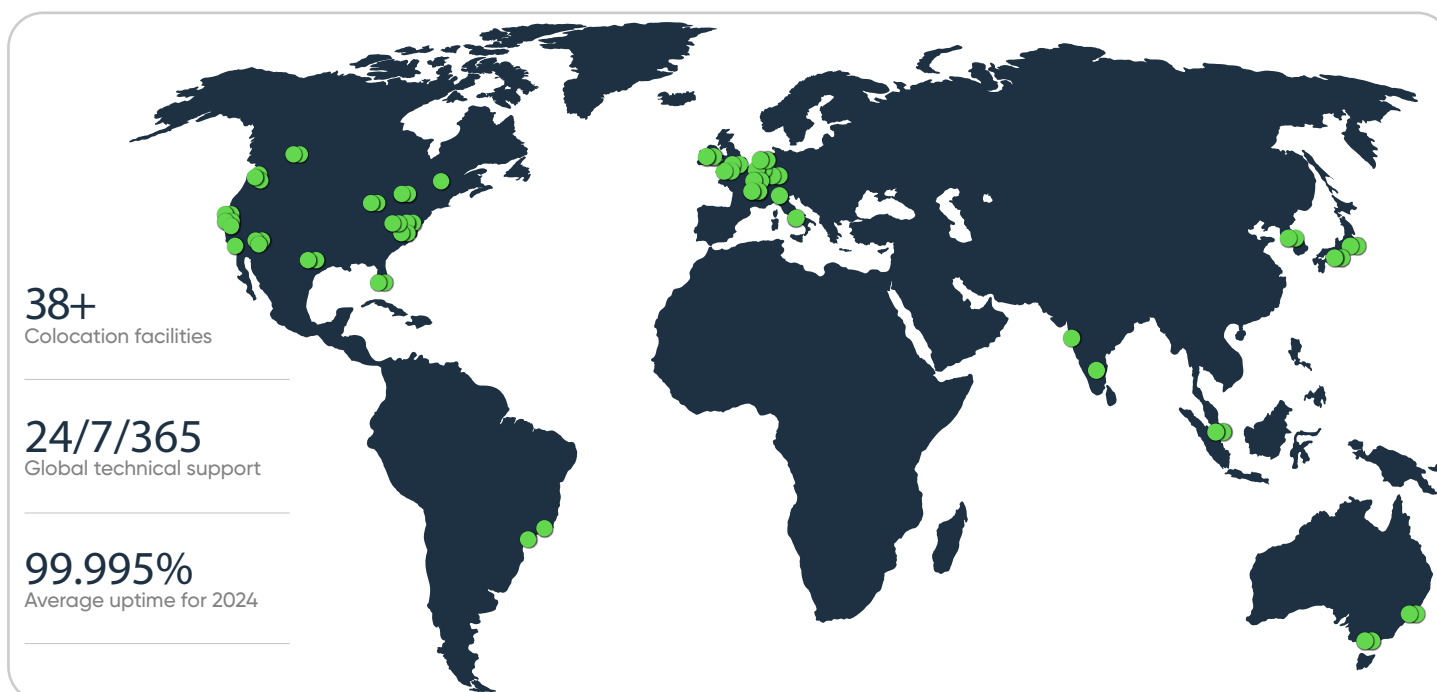
## Global colocation regions

The ServiceNow colocation facilities are arranged in regional pairs spanning five continents: Asia, Australia, Europe, North America, and South America.

ServiceNow uses top-tier global colocation facility providers. These providers have no logical access to any ServiceNow systems or customer data and solely provide private colocation spaces and environmental resources.

Only ServiceNow personnel with direct responsibility for (or role in) maintaining colocation spaces can physically access colocation facilities.

ServiceNow also offers colocation facility pairs exclusively for qualified US Federal and Swiss banking customers. Meeting regulatory and sovereignty obligations is a significant factor when selecting colocation facility facilities within specific geographic boundaries.



## Performance and scalability

The ServiceNow cloud can scale to meet the needs of the largest global enterprises, with tens of thousands of customer instances operating in globally distributed colocation facilities. All instances are deployed per customer, allowing the multi-instance cloud to scale horizontally to meet each customer's performance needs.

Customer instances perform an aggregate of tens of billions of full-page transactions every month, and customers using the ServiceNow Configuration Management Database (CMDB) as their single system of record may manage tens of millions of Configuration Items (CIs).

The ServiceNow application averages a minimum of 99.994% uptime.

## Critical resources

ServiceNow is responsible for managing the environment, the supporting infrastructure, and vendor relationships. The ServiceNow Site Reliability Engineering (SRE) center employs a follow-the-sun model that provides continual operational monitoring, and support of the ServiceNow environment and infrastructure. ServiceNow rotates operations and technical support daily in North America, the UK, India, Australia, Netherlands, Japan, and Ireland.

Critical system resources, including DNS, email, ServiceNow cloud operation systems, and customer service systems, use high-availability configurations in at least two colocation facilities. These resources are independent of the internal ServiceNow corporate IT infrastructure.

ServiceNow uses AHA for development systems, including managing source code control and the software build process, which are also hosted at the production colocation facilities. The ServiceNow AHA architecture ensures the highest continuity for ServiceNow developers, enabling them to develop and support the application without requiring physical access to ServiceNow offices.

## Data backup and recovery

The ServiceNow Advanced High Availability architecture is the primary means to restore service in the case of a disruption that could impact availability.

Full backups are performed direct to disk every seven days, with differential backups performed every 24 hours. These backups are retained in accordance with ServiceNow standard operating procedures.

Backups are stored in the same colocation facilities where the data resides, with production instances backed up in both colocation facilities in the pair. Sub-production instances (commonly used for testing and development purposes) are backed up only in their primary colocation facility, as they are not AHA capable.

All backups are written to disk; tapes and removable media are not used. Backups are not sent off-site, but they are made within both colocation facilities in a pair, therefore benefiting from geographic separation.

Backups are encrypted with AES-256 using randomly generated encryption keys for every backup. These are kept in a secure key store and the backup is only retrieved by an automated process if a data restore is initiated. Regular, automated tests are run to ensure the quality of backups and any failures are reported for remediation within ServiceNow.



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The ServiceNow backup architecture is not designed to provide archival records. However, customers may retain data within their instances for as long as they need during the subscription term, in accordance with their policy or regulatory requirements. Additionally, there are capabilities available within the ServiceNow AI Platform to allow customers to manage their unique instances logs and regularly export data to external systems, as required.

In specific scenarios, using more traditional data backup and recovery mechanisms may be appropriate. For example, if a customer deletes some data inadvertently or if a customer's data integration or automation gets misconfigured or malfunctions, this could render data unusable or inaccessible. In these scenarios, the high availability architecture would not be applicable, and restoring from backup is the only option for recovery.

## Transfer and failover

ServiceNow has two distinct processes related to ensuring instance availability: transfer and failover.

### Transfer

A transfer of an instance is a scheduled event, usually performed for maintenance purposes. Any associated outages occur within the contracted availability service level agreement that ServiceNow commits to with its customers.

### Failover

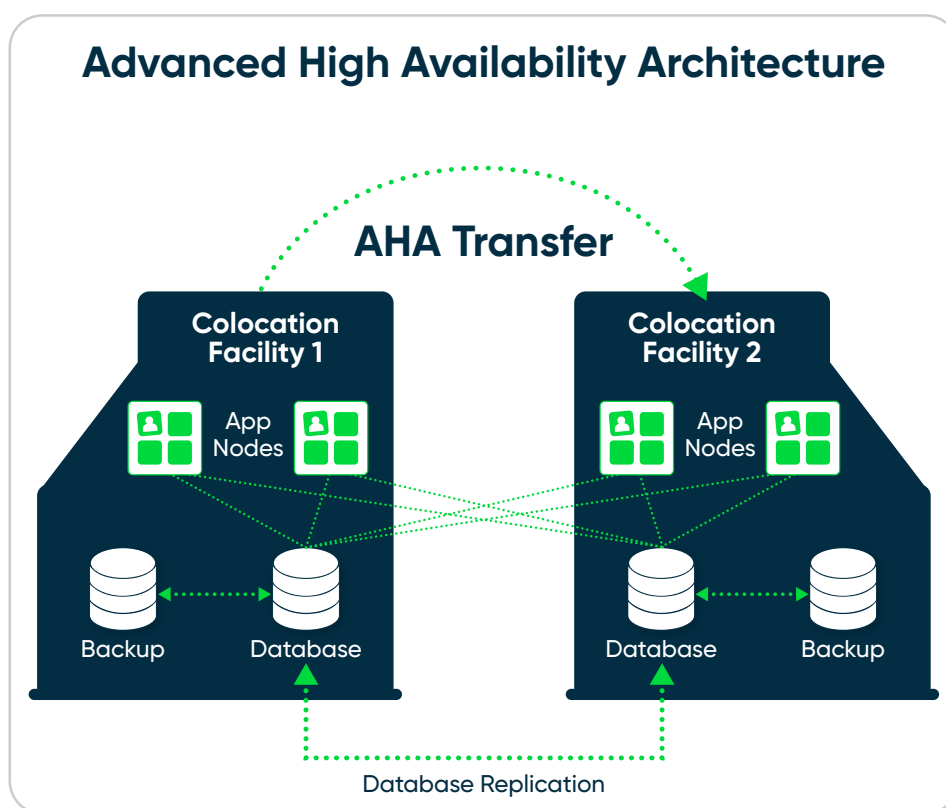
An instance failover is an event usually performed when availability for one or more customer instances cannot be maintained. Failover could occur due to a local component failure, a major environmental incident, or a resource outage.

In the case of a local component failure, a failover to a system within the same colocation facility will be attempted first.

If a colocation facility-wide outage is identified, all current active production instances in the impacted colocation facility will be failed over to the passive colocation facility in the pair. In this circumstance, a Recovery Point Objective (RPO) of one hour and a Recovery Time Objective (RTO) of two hours is targeted.

Due to the almost real-time replication between colocation facilities, these times are usually significantly shorter than the stated RTO/RPO.

Automation technology built on the ServiceNow AI Platform is used to transfer or failover instances when necessary. The mechanisms for both processes are very similar. The current passive system is designated active, and vice versa. To complete the process, DNS mappings and instance database configurations are updated accordingly. Redundant DNS providers and DNSSEC (Domain Name System Security Extensions) are employed to provide robust, resilient name resolution services.



## Conclusion

ServiceNow is committed to providing cloud services that are always highly available, with built-in redundancy across all network and server infrastructure.

All customer instances are individually provisioned on advanced multi-instance architecture which ensures that one customer's data is processed separately from others and that any maintenance carried out on one customer's instance does not impact any other customer.

Colocation facilities are arranged in pairs providing near-instant transfer from one colocation facility to another providing Advanced High Availability for all customer production instances.

Upgrades can be performed at a schedule determined by each individual customer, with no downtime required. Full backups are performed every seven days, with differential backups taken every 24 hours.

Finally, the ServiceNow cloud can easily be scaled horizontally to meet the needs of even the largest global enterprise.

For further details on how ServiceNow delivers secure, scalable, and compliant cloud services, visit the [ServiceNow Trust site](#).

## Resources



[Videos: ServiceNow Security](#)

- [Securing the ServiceNow AI Platform white paper](#)
- [Cloud Security Customer Resources](#)
- [ServiceNow Product Documentation](#)

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