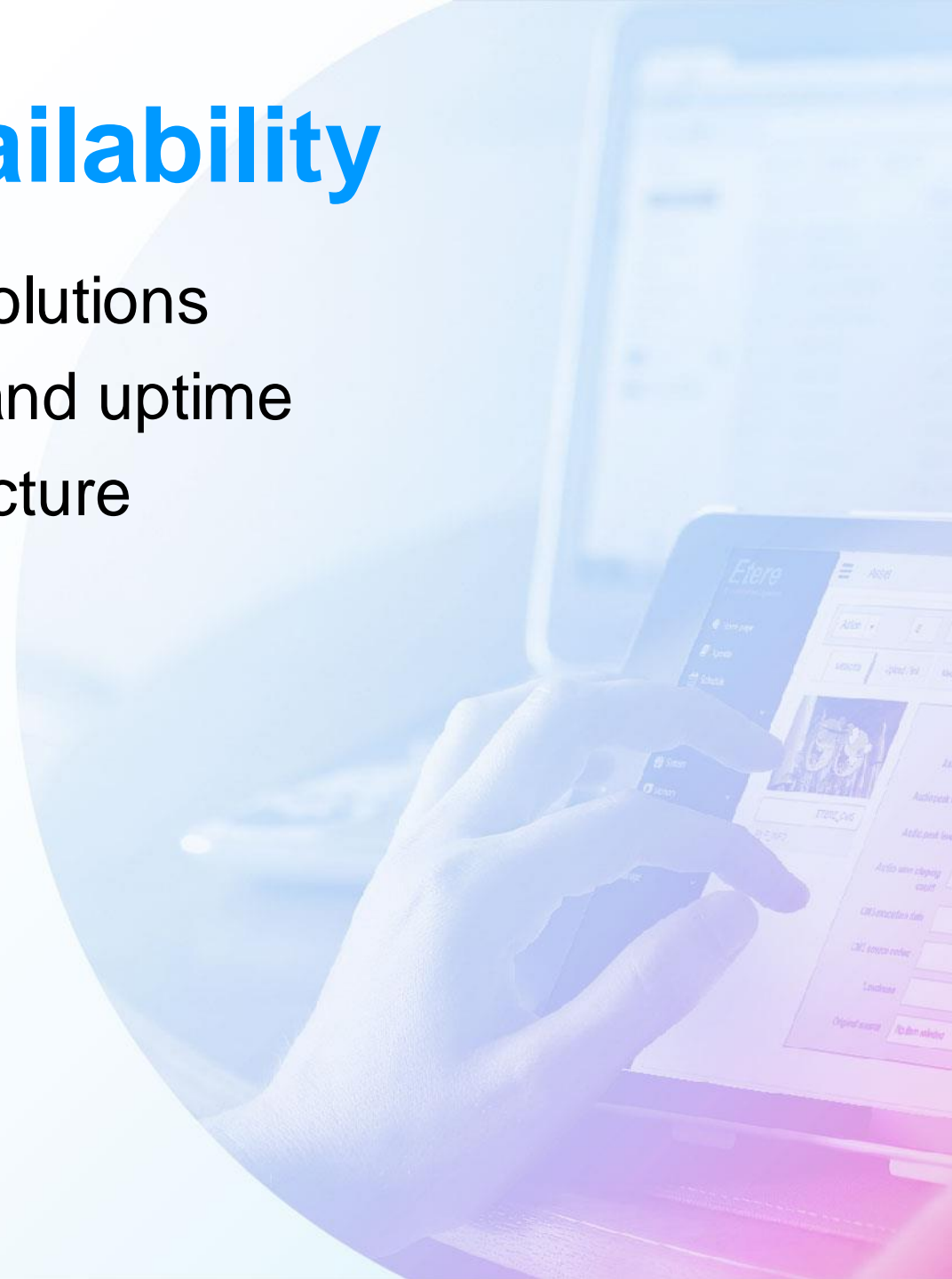


Etere Supports Microsoft High Availability Solutions



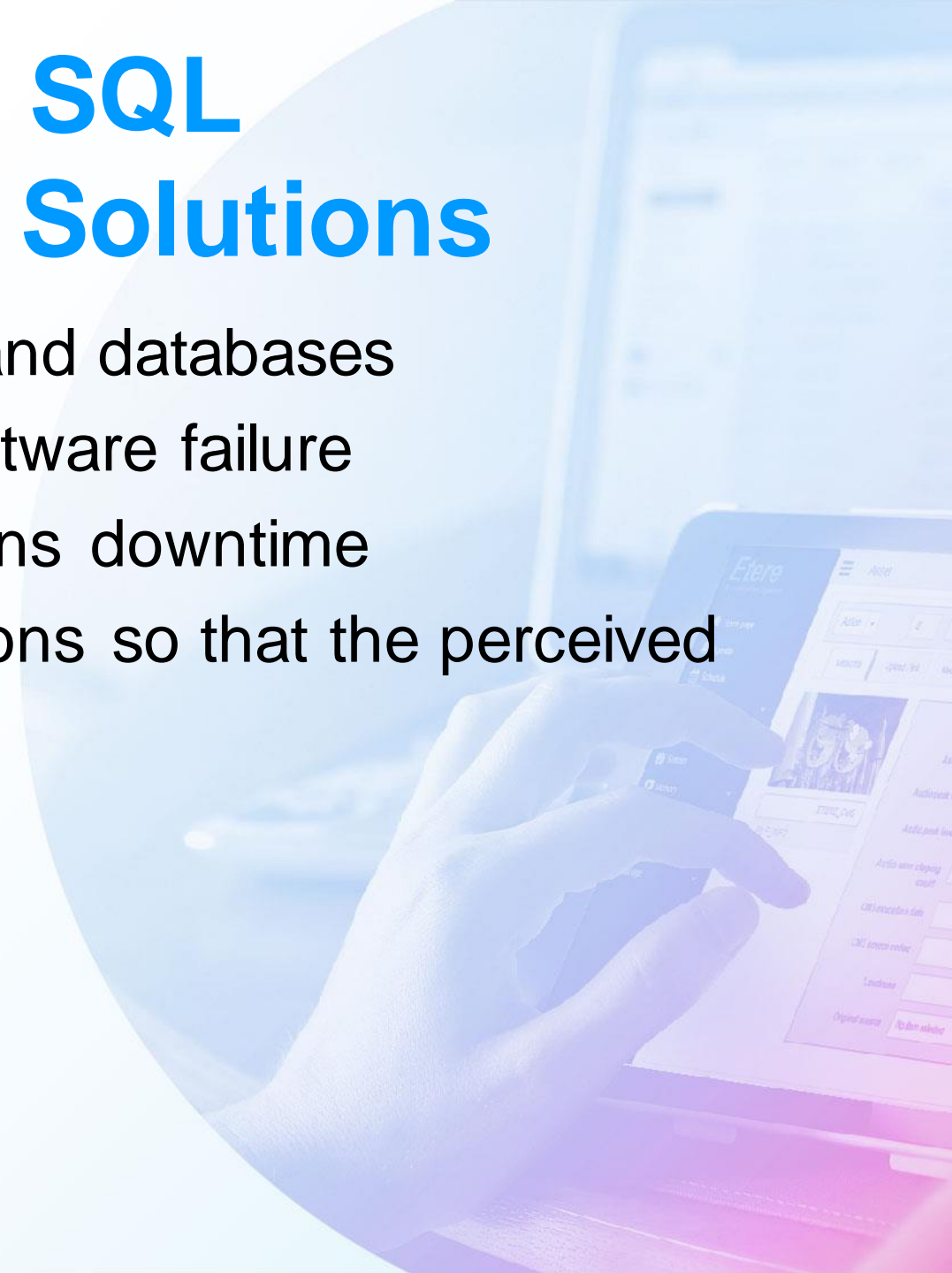
Etere High Availability

- Supports Microsoft high availability solutions
- Maintains a high level of availability and uptime
- Load-balancing as part of the architecture
- High level of fault tolerance
- Supports failover cluster

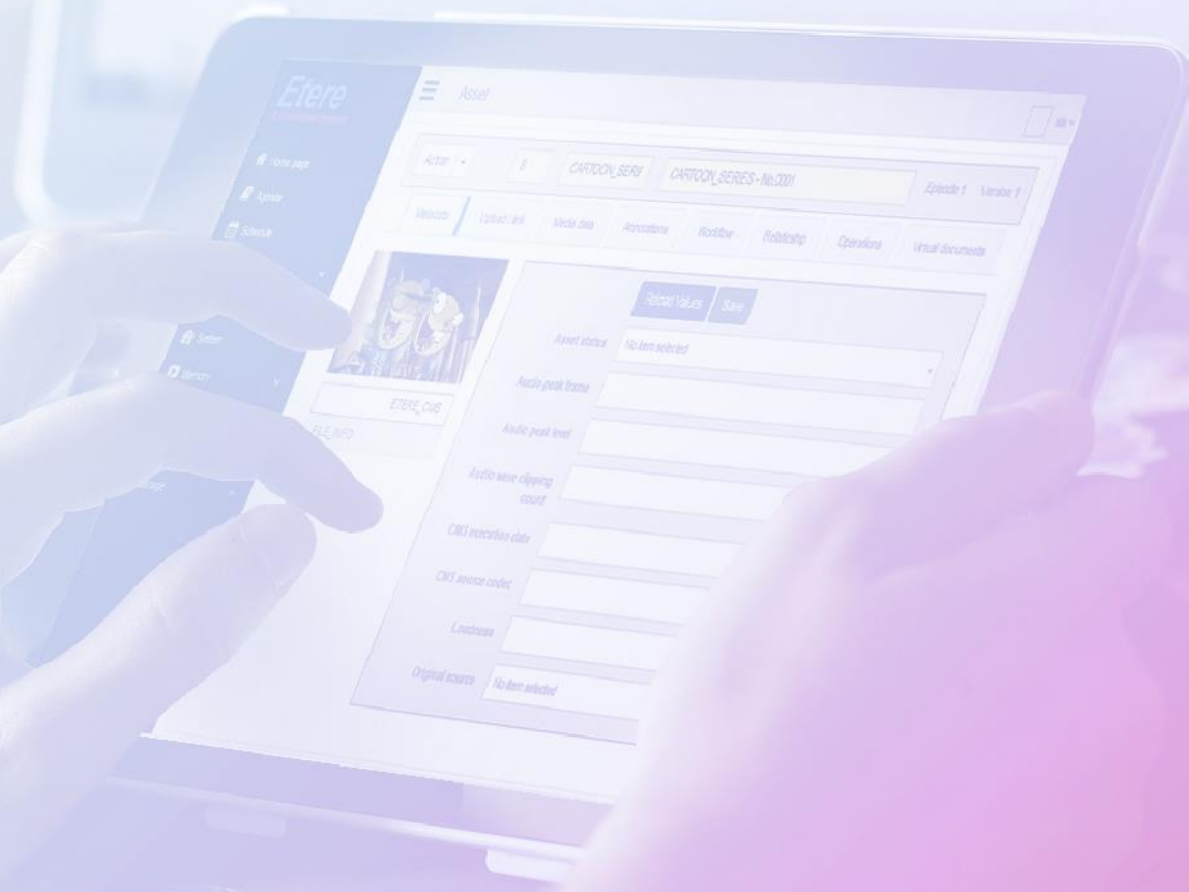


The Role of SQL High Availability Solutions

- Improves the availability of servers and databases
- Masks the effects of hardware or software failure
- Reduces the availability of applications downtime
- Maintains the availability of applications so that the perceived downtime for users is minimized



Overview of SQL Server High- Availability Options



Always On Failover Cluster Instances

Always On Failover Cluster Instances

- Leverages Windows Server Failover Clustering (WSFC)
- Provides local high availability through redundancy at the server-instance of SQL Server that is installed across WSFC nodes and across multiple subnets
- The FCI provides failover from one WSFC node to another if the current node becomes unavailable



Always On Availability Groups

Always On Availability Groups

- An enterprise-level high availability and disaster recovery solution in SQL Server 2012
- Enables maximized availability for one or more user databases
- Requires that the SQL Server instances reside on Windows Server Failover Clustering (WSFC) nodes

Database Mirroring

Database Mirroring

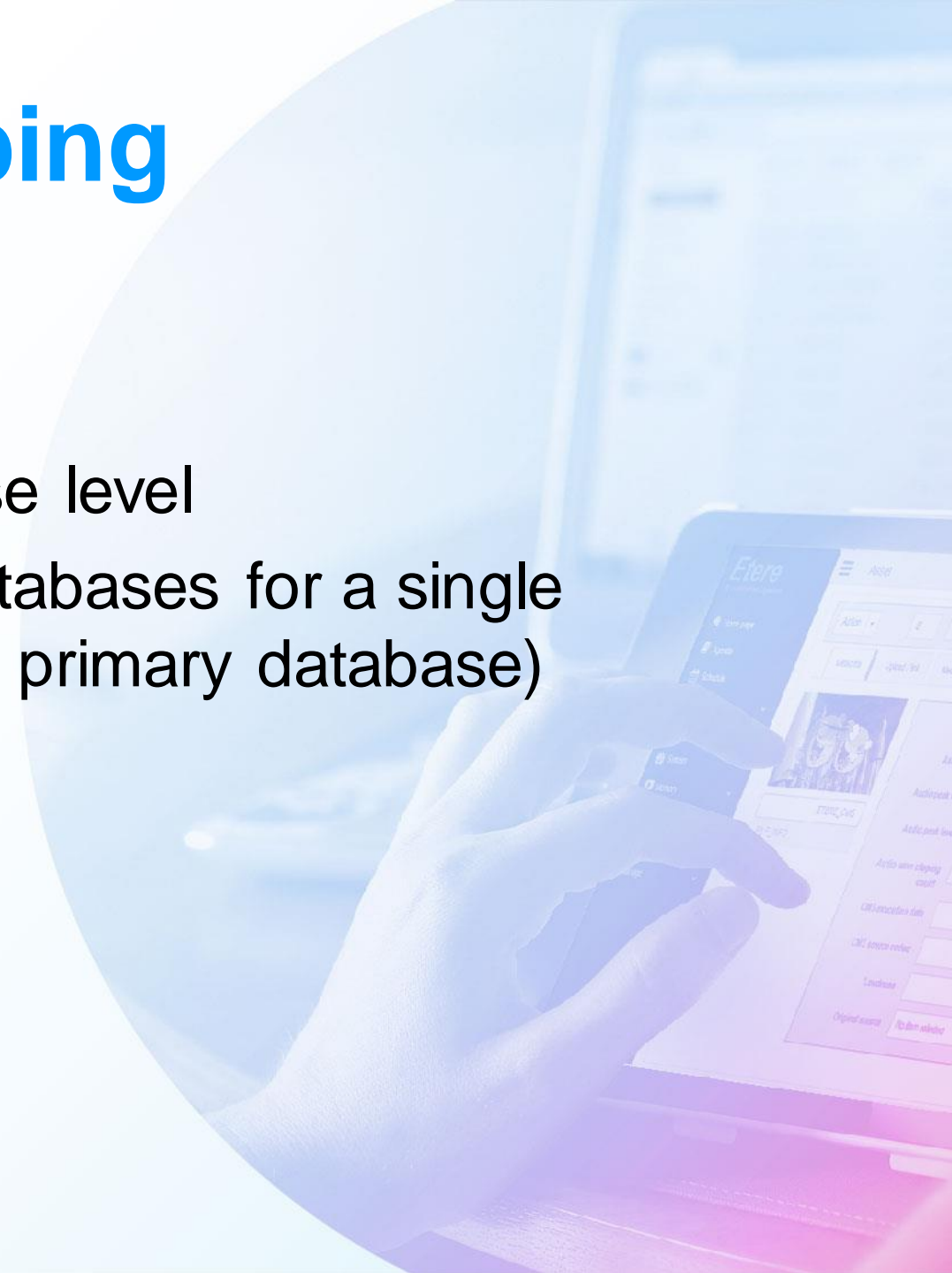
- Increases database availability
- Supports almost instantaneous failover
- Maintains a single standby database or mirror database for a corresponding production database that is referred to as the principal database

*This feature is in maintenance mode and may be removed in future version of Microsoft SQL server

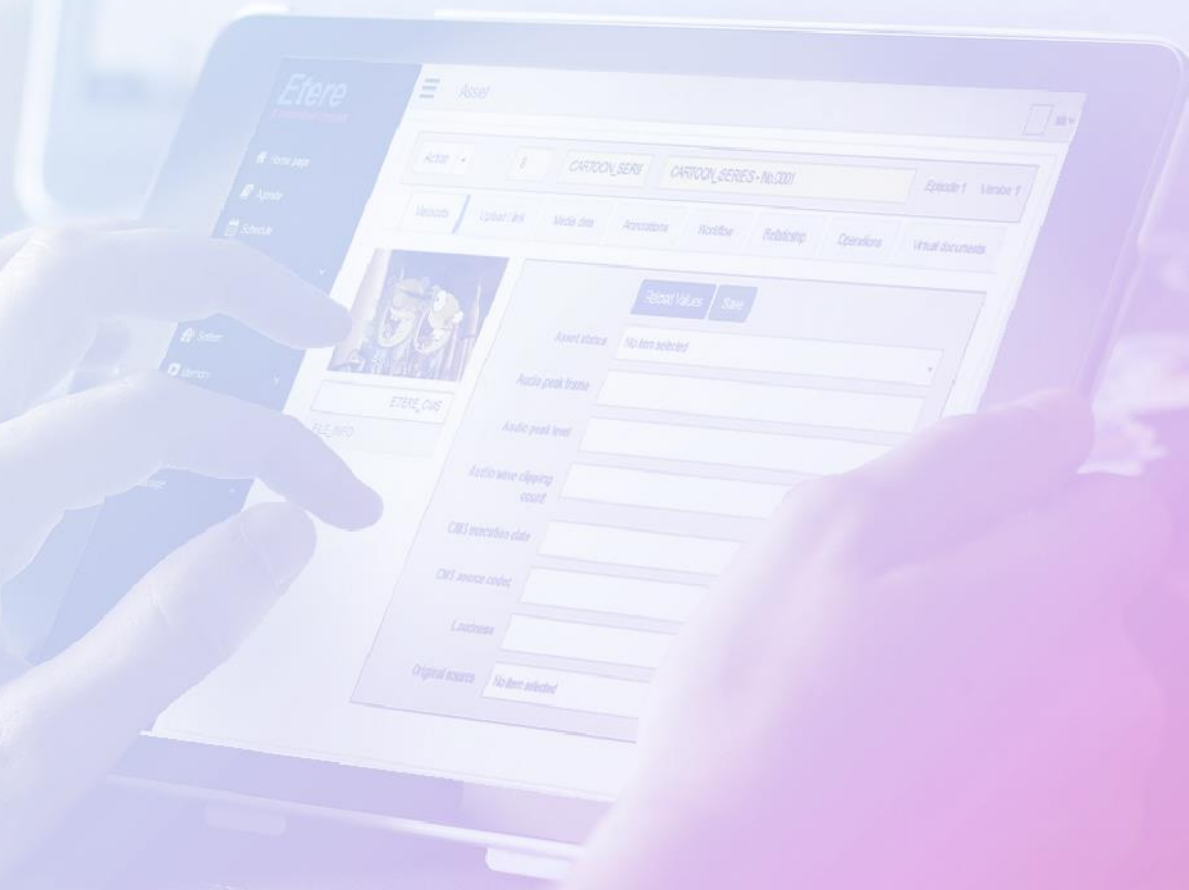
Log Shipping

Log Shipping

- Log shipping operates at the database level
- Maintains one or more secondary databases for a single production database (also known as primary database)



Windows Server Failover Clustering with SQL Server (WSFC)



Windows Server Failover Clustering (WSFC)

Windows Server Failover Cluster (WSFC)

- WSFC is a group of independent servers that work together to increase the availability of applications and services
- Provides the infrastructure features that support the high-availability and disaster recovery scenarios



Windows Server Failover Clustering (WSFC)

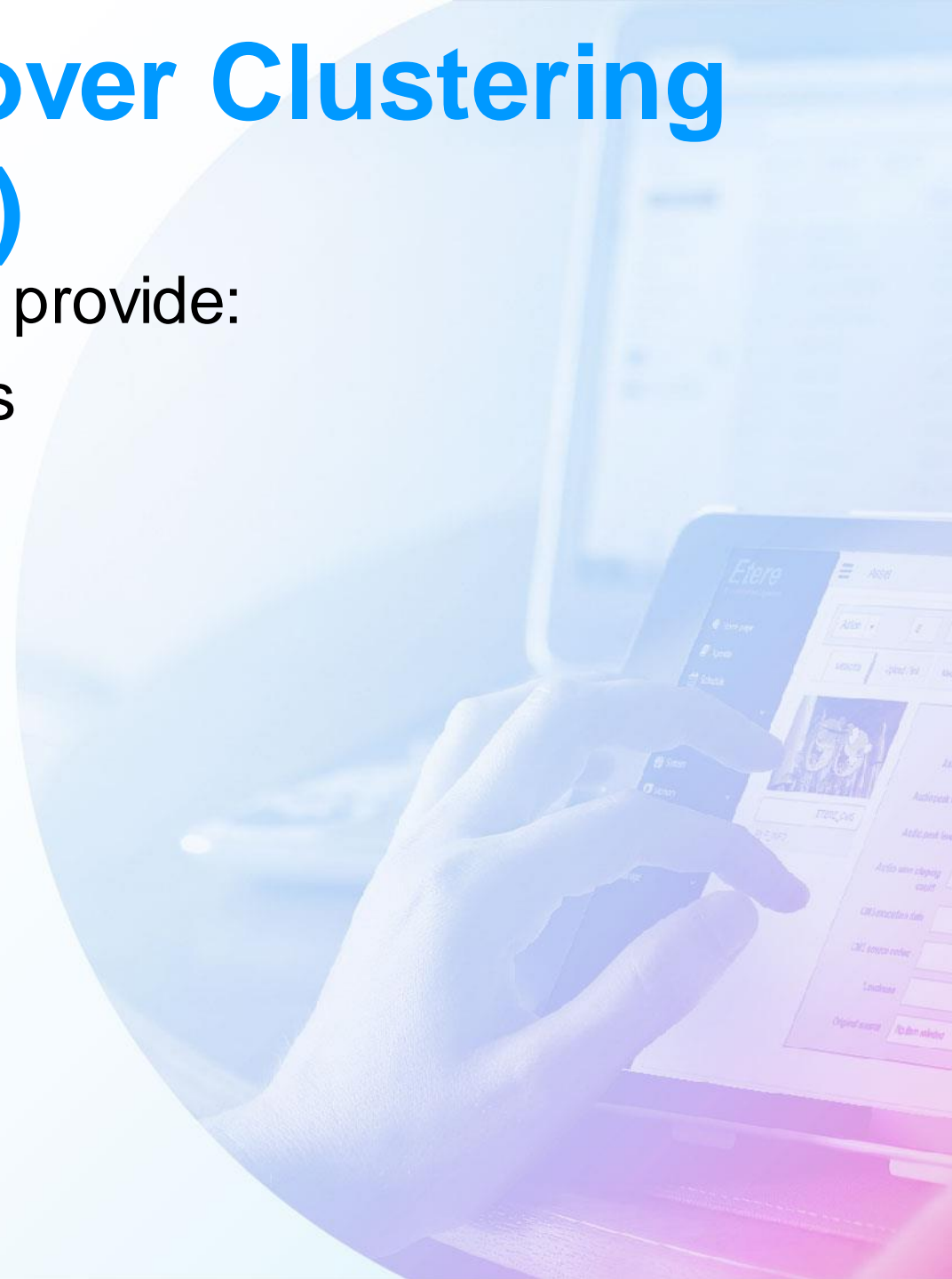
- Support the high-availability and disaster recovery scenarios of hosted server applications such as Microsoft SQL Server and Microsoft Exchange
- In an instance of a cluster node or service failure, the WSFC service transfers ownership of instance's resources to a designated failover node
- SQL Server instance is then re-started on the failover node, and databases are recovered as usual

* An Always On Failover Cluster Instance requires symmetrical shared disk storage such as a storage area network (SAN) or SMB file share. The shared disk storage volumes must be available to all potential failover nodes in the WSFC cluster.

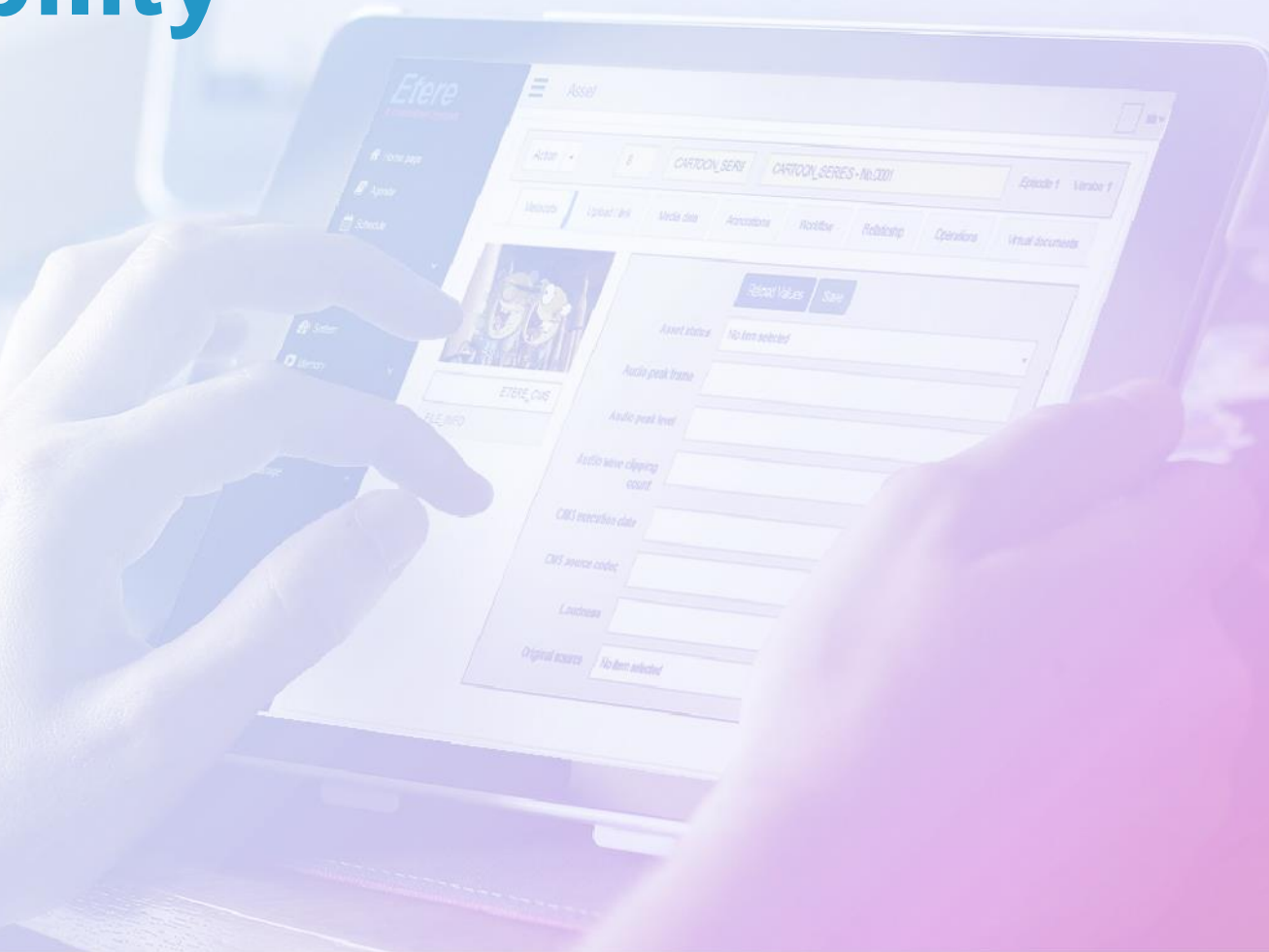
Windows Server Failover Clustering (WSFC)

The nodes in a WSFC work together to provide:

- Distributed metadata and notifications
- Resource management
- Health monitoring
- Failover coordination

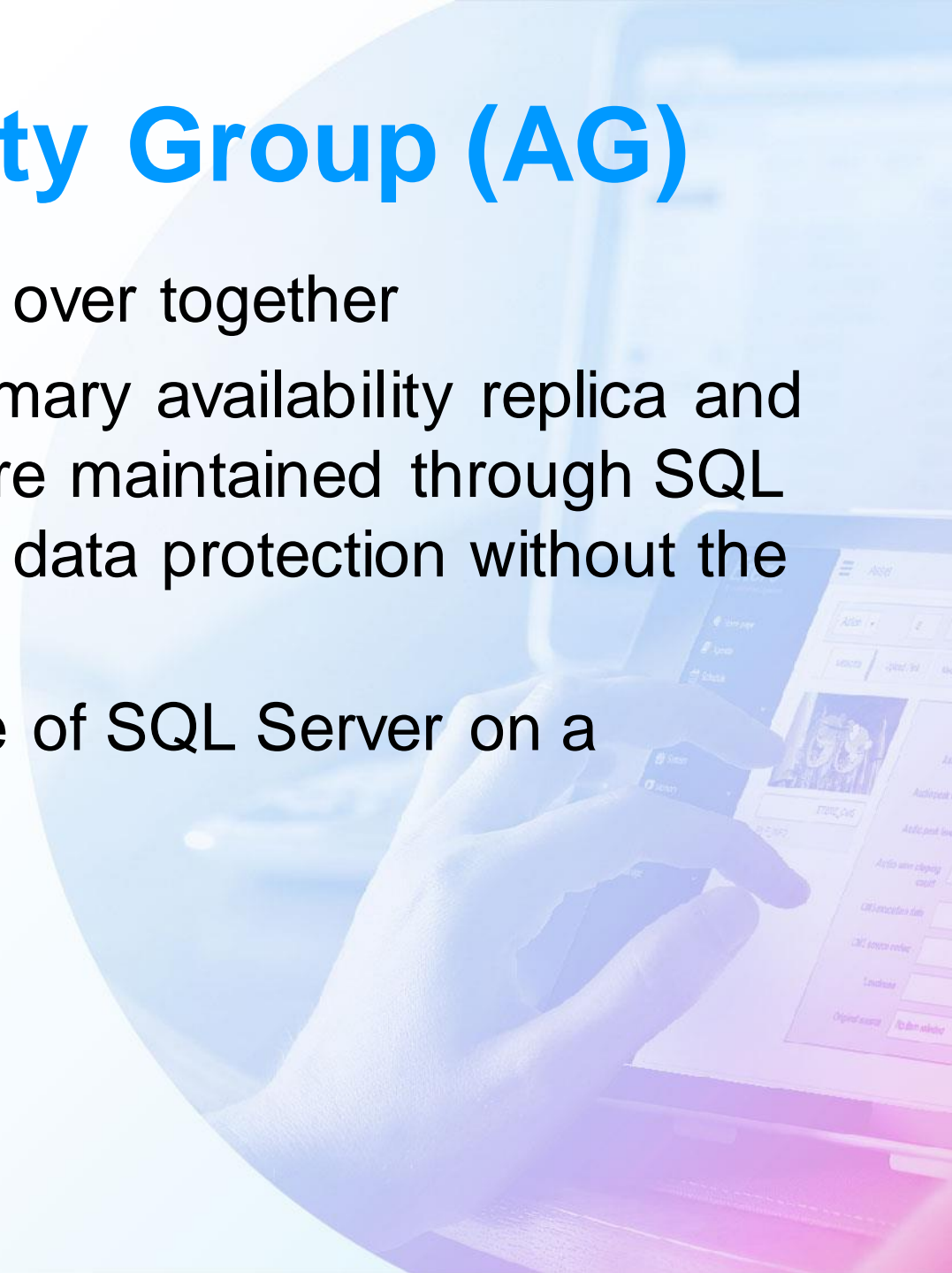


Always On Availability Group (AG)



Always On Availability Group (AG)

- One or more user databases that fail over together
- An availability group consists of a primary availability replica and one to four secondary replicas that are maintained through SQL Server log-based data movement for data protection without the need for shared storage
- Each replica is hosted by an instance of SQL Server on a different node of the WSFC



Always On Availability Group (AG)

- In the event of a failover, instead of transferring ownership of shared physical resources to another node, WSFC is leveraged to reconfigure a secondary replica on another SQL Server instance to become the availability group's primary replica
- The availability group's virtual network name resource is then transferred to that instance

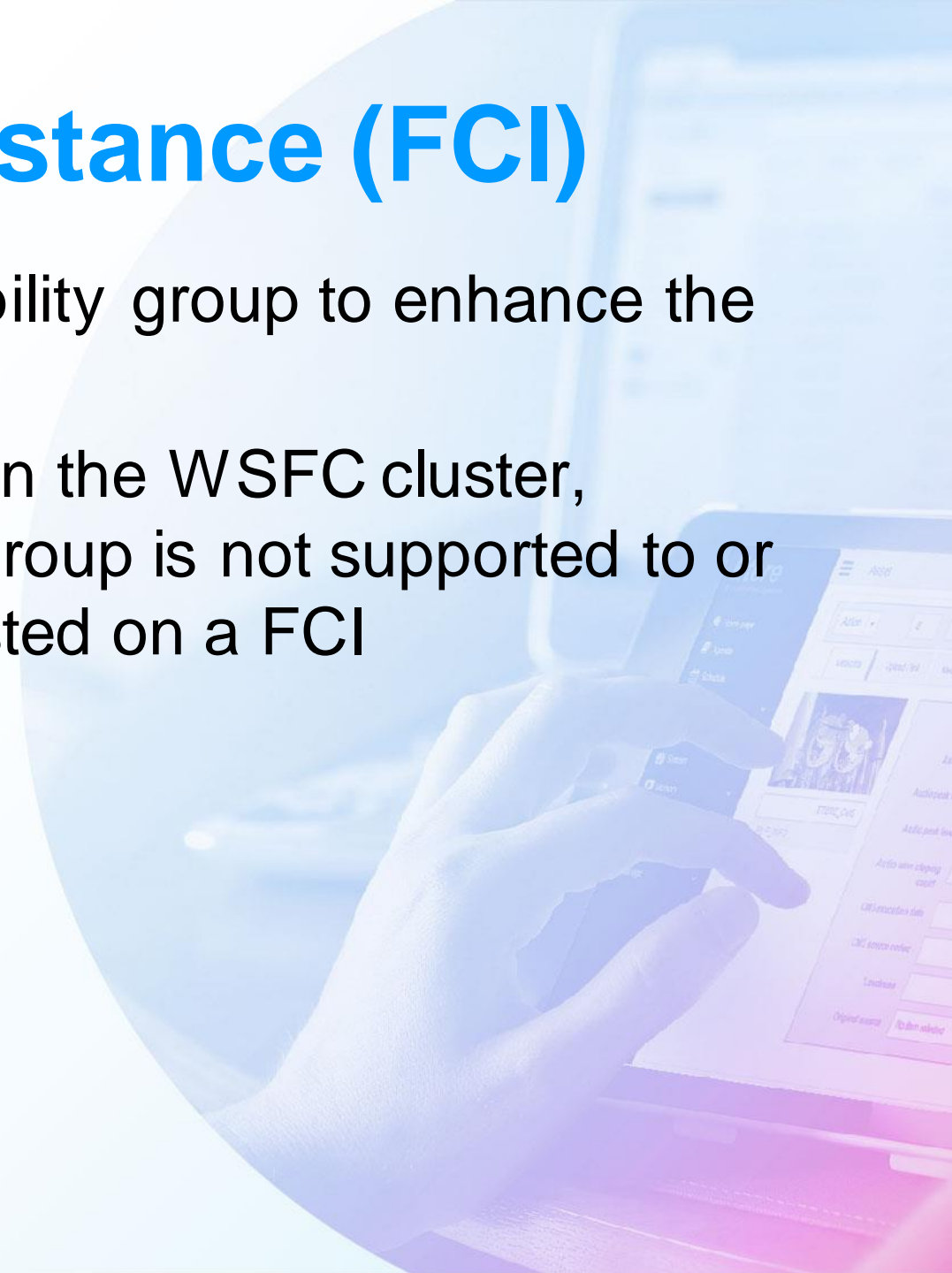
* Always On availability groups do not require deployment of a Failover Cluster Instance or use of symmetric shared storage (SAN or SMB)

Failover Cluster Instance (FCI)

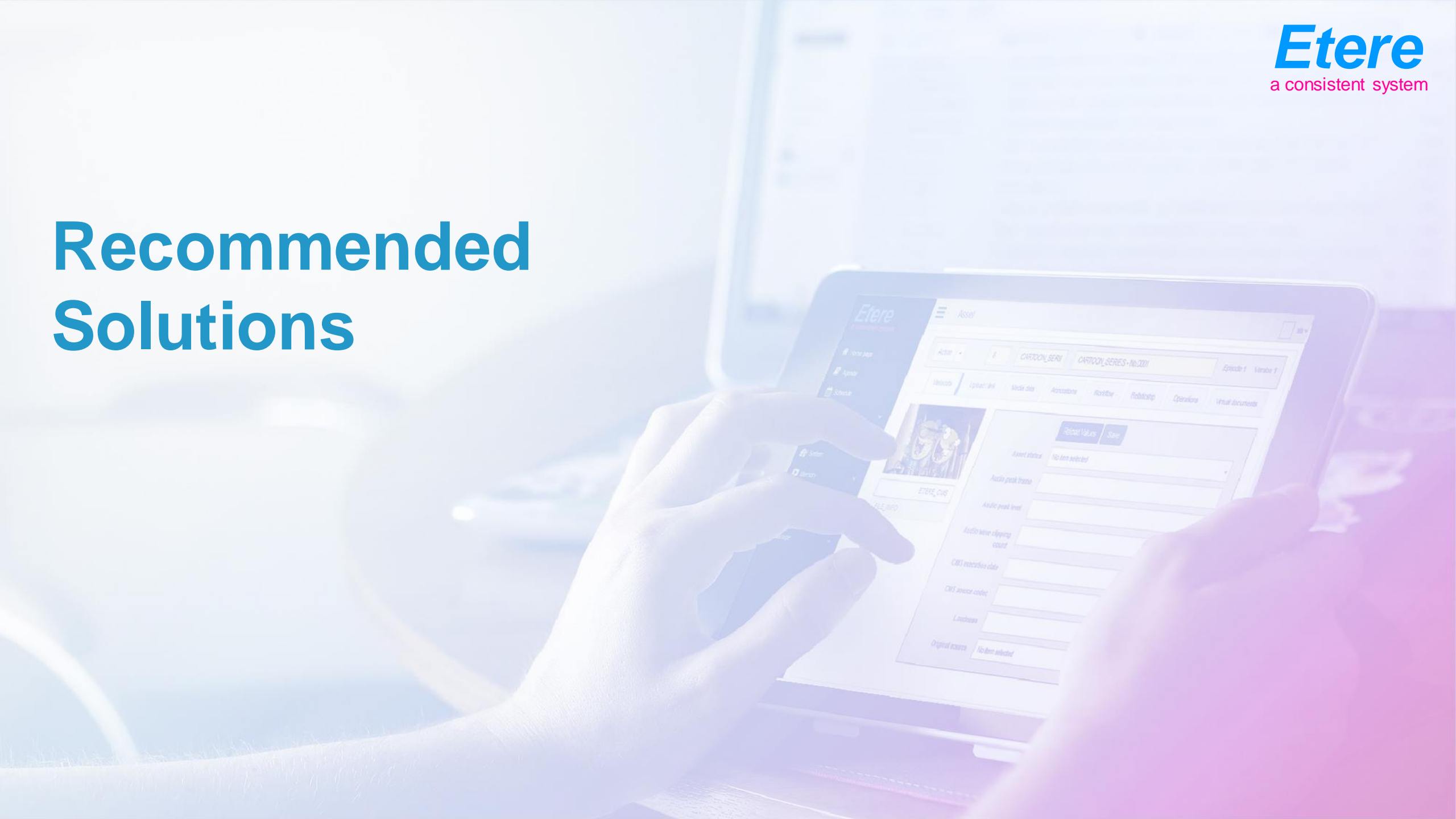


Failover Cluster Instance (FCI)

- May be used together with an availability group to enhance the availability of an availability replica
- To prevent potential race conditions in the WSFC cluster, automatic failover of the availability group is not supported to or from an availability replica that is hosted on a FCI



Recommended Solutions



Recommended Solutions

Scenario	Solution
Data protection through a third-party disk solution	Always On Failover Cluster Instances
Data protection through SQL Server	Always On availability groups
SQL server that does not support Always On availability groups	Log shipping

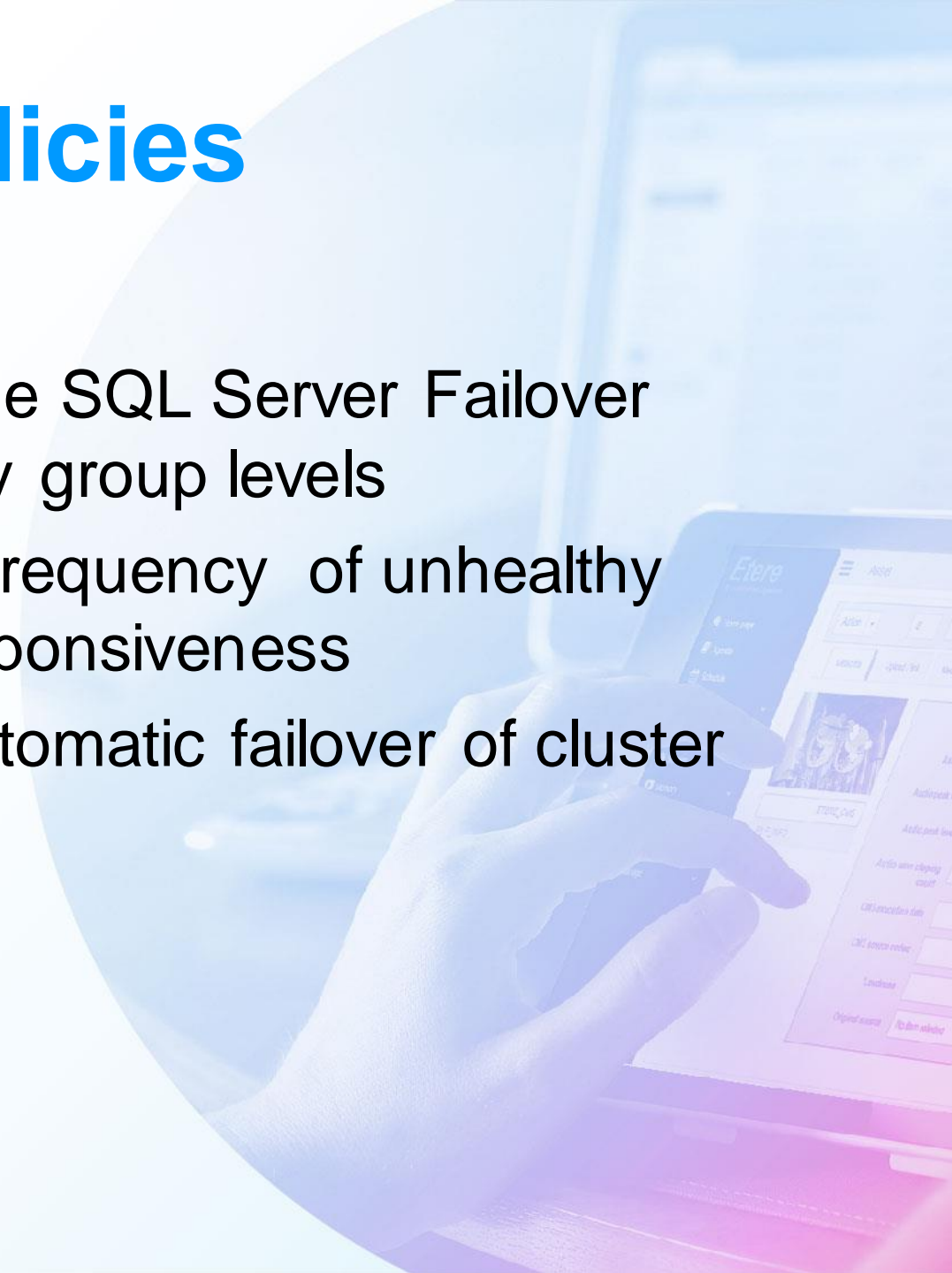
WSFC Health Monitoring and Failover



Failover Policies

What is a failover policy?

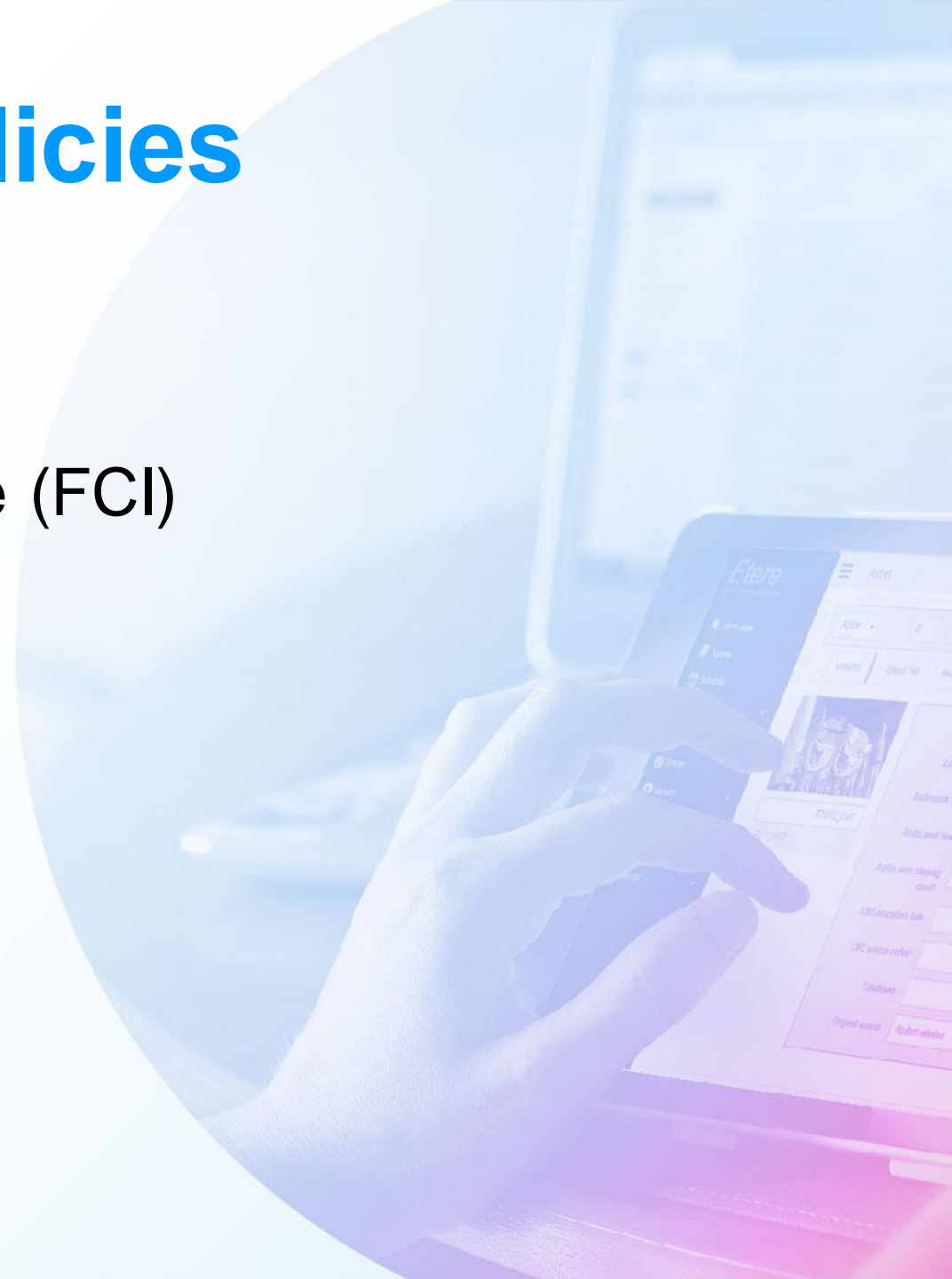
- It is configured at the WSFC node, the SQL Server Failover Cluster Instance (FCI), the availability group levels
- Based on the severity, duration and frequency of unhealthy cluster resource status and node responsiveness
- Can trigger a service restart or an automatic failover of cluster resources from one node to another



Failover Policies

A failover policy is configured at the

- WSFC node
- SQL Server Failover Cluster Instance (FCI)
- Availability group levels

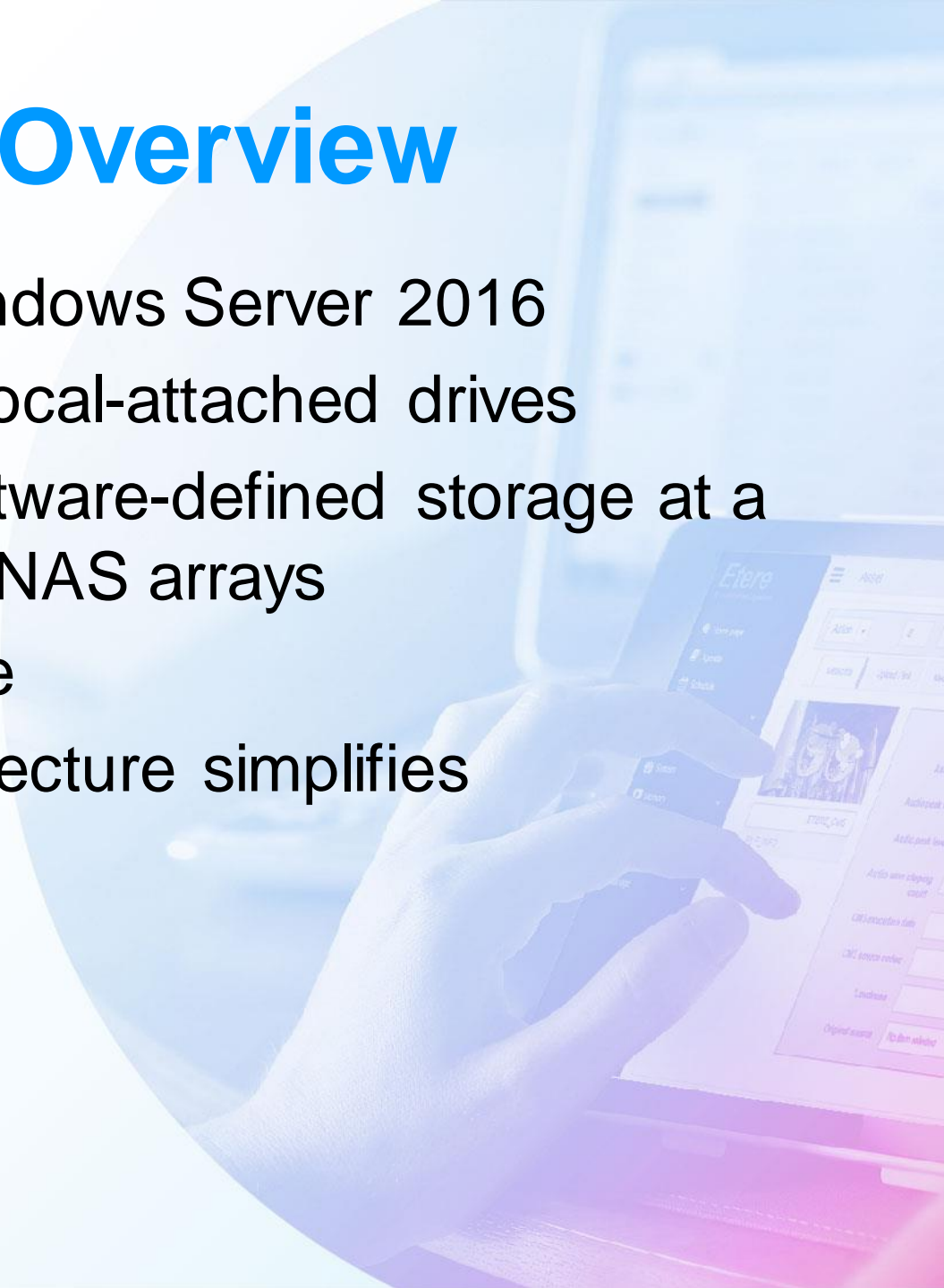


Storage Spaces Direct



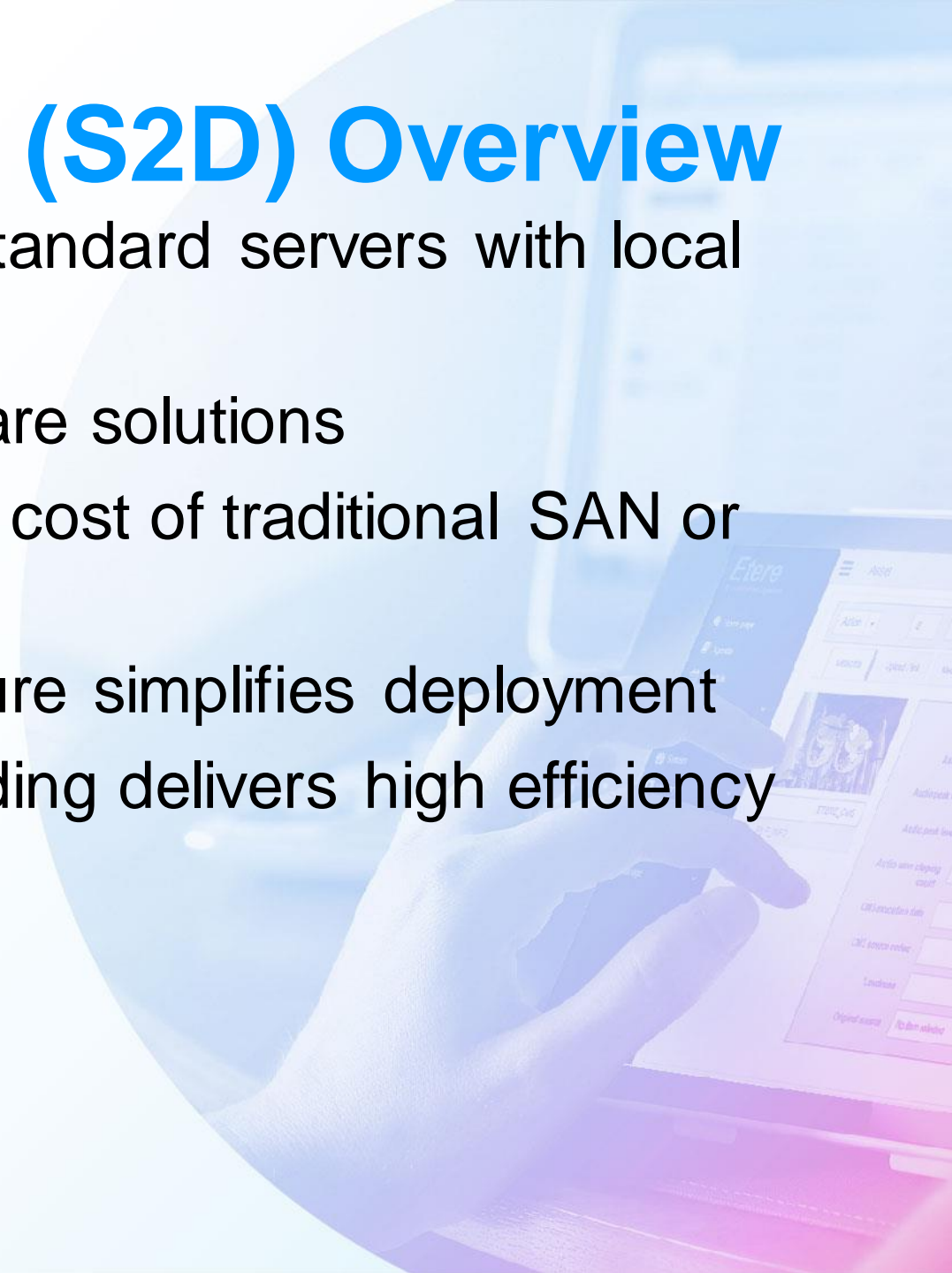
Storage Spaces Overview

- Applies to Windows Server 2019, Windows Server 2016
- Uses industry-standard servers with local-attached drives
- Creates highly available, scalable software-defined storage at a fraction of the cost of traditional SAN/NAS arrays
- Helps to protect data from drive failure
- Converged or hyper-converged architecture simplifies procurement and deployment



Storage Spaces Direct (S2D) Overview

- Storage Spaces Direct uses industry-standard servers with local attached drives
- Highly available, highly scalable software solutions
- Highly cost-efficient at a fraction of the cost of traditional SAN or NAS arrays
- Converged/hyper-converged architecture simplifies deployment
- Caching, storage tiers and erasure coding delivers high efficiency



Storage Spaces Features

Features :

- Caching
- Storage tiers
- Erasure coding
- RDMA networking and NVMe drives
- Delivers unrivalled efficiency and performance



Storage Spaces Direct (S2D) Support

Storage Spaces Direct is included in

- Windows Server 2019 Datacentre
- Windows Server 2016 Datacentre
- Windows Server Insider Preview Builds



www.etere.com

