

D E L P H I X

**Delphix Engine Release Notes**

**June, 2018**

Delphix Engine Release Notes

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# Release Notes 5.2.x

Welcome to the 5.2 release of the Delphix Engine database virtualization system.

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## New Features

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## Release 5.2.5

This release has several significant new features that will change the way our customers use our products.

### 5.2.5 New Features

#### Multiple NIC Support for Oracle and ASE

Delphix previously only allowed one IP Address to be specified per host. Now, customers can specify a list of IP addresses for Oracle and ASE instances that will accept mount traffic from Delphix. For more information please see, [Adding an SAP ASE Environment](#) and [Adding an Oracle Single Instance or RAC Environment](#).

#### NetBackup Ingestion Support for SQL Server

In 5.2.5, Delphix introduces the ability to use NetBackup backups to sync SQL Server databases. Existing NetBackup backups can be used as sources to sync an initial backup and to stay current

with the production data source. NetBackup integration will now be part of the environment discovery workflow. This feature will allow for much faster SQL server deployments. For more information please see, [Linking a dSource from a NetBackup SQL Server Backup](#).

## Multiple Backup Locations Support for SQL Server

With this release, Delphix enables users to enter multiple backup locations to search for backups when adding new data sources. Many customers store their full and transaction log backups in different locations and this will allow them to more easily get data into Delphix. For more information please see, [Delphix as a Backup Solution to SQL Server](#) and [Linking a SQL Server dSource](#)

## Enhanced TLS Support

In 5.2.4 Delphix added the ability for customers to upload and manage their own HTTPS certificates using the CLI. Starting in 5.2.5 Delphix is introducing the ability to upload and manage the host's DSP certificates. An intuitive UI has been added for customers to manage all certificates. For more information please see, [Certificate Management](#).

## Terminating long-running EBS appsTier processes

In 5.2.5, customers get a configurable option to define a timeout value to terminate running appsTier processes if the value is exceeded.

## Upgrade and downgrade Testing for DB2 Fix Packs

Starting in 5.2.5, Delphix allows customers to perform upgrade/downgrade testing between the fix packs of a major DB2 version. Upgrade testing allows our customers to validate a new or untested DB2 fix pack version before deploying it in Production or before an application rollout. The downgrade testing is a less common scenario. Customers who are facing issues after an upgrade to a newer fix pack can easily downgrade and test the previous, stable DB2 fix pack version in their non-production environments before making the changes in production.

## Support for different ASE patch level versions between the source and staging hosts

Starting in 5.2.5, for all currently supported ASE versions, Delphix allows customers to use different ASE patch level versions between the source and staging hosts. The major version of ASE must still be the same. The only caveat is for ASE 15.7 - where the source and staging patch levels must both be either any version below SP64 or both be any version above SP100.

## Key Product Updates

- AWS r4.2xlarge, r4.4xlarge, and r4.8xlarge Support: Delphix Dynamic Platform can run on AWS memory-optimized R4 Instances starting with this release. Customers with existing AWS accounts can run our engines on the latest released AWS R4 instances. R4 instances are more cost-effective than the earlier-generation R3 instances. Migration from R3 to R4 is a one-time effort.
- AWS i3.2x, i3.4xlarge, i3.8xlarge Support: We will be adding support for the next generation of the storage-optimized i3 AWS instance types. The cost and performance benefits of the i3 instances make it a natural transition for customers currently using the i2 instances.

- Custom Algorithm (Mapplet) Manageability: Custom algorithms (also commonly referred to as mapplets) are extensions to the main Masking product that allow Delphix Professional Services to create custom functionality for customers. These custom algorithms are not supported by Delphix Support but rather by our services team. One issue that has arisen in the past is that we do not clearly indicate in the UI or in our logs when a custom algorithm is being used. In 5.2.5 we are aiming to make it much clearer in the UI and in the logs when a custom algorithm is being used.
- Enhanced ingestion for DB2 databases: In the past, customers have reported considerably slower performance during ingestion of larger DB2 databases. In 5.2.5, we are making product improvements to enable faster ingestion of DB2 databases in Delphix. The performance will be noticeably better for larger DB2 databases.
- Update of Target Weblogic Password: During EBS provisioning and refresh operations, we had a security issue where the target Weblogic password was not updated with the user-supplied password but instead was incorrectly assigned with the production password. In 5.2.5, we will fix this issue to ensure that the user-supplied password is updated in the Target during provisioning and persists through the Delphix operations.

### **New Certifications:**

In each release, Delphix aims to keep up to date on the latest database platforms. As a reminder, we've currently shipped all relevant SQL Server certifications, so there will be fewer updates here.

- Oracle 12c R2 Masking: Users will be able to specify the particular PDB they would like to connect to through the Advanced Oracle Connector (using the JDBC URL parameter).

## **Release 5.2.4**

This release has several significant new features that will change the way our customers use our products.

### **5.2.4 New Features**

#### **TLS Certificate Upload**

In 5.2.4 Delphix supports uploading TLS certificates via the virtualization command line. For more information please refer to [Replacing the HTTPS \(HTTP Secure\) Certificate](#).

#### **Customize DB2 dSource and VDB Parameters**

Customers' production systems are normally performance-optimized servers configured with large amounts of memory, buffer size, etc. However, their non-production systems are often resource-optimized and differ significantly in configuration. With 5.2.4, customers have the ability to modify different dSource and VDB parameters such that they match the resources available on the staging and target hosts. These settings can either be made during initial setup and deployment time or be changed for an active dSource or VDB.

#### **Expanded Masking File Format Upload**

In addition to relational databases, the Masking Engine supports masking files. For the Masking Engine to properly interpret a file's structure, users upload a format file. In 5.2.4, we have expanded support for uploading format files using a web browser to XML and VSAM copybooks. For more information please refer to [Managing File Formats](#).

#### **Using DB2 Databases with Raw Devices**

Several customers use raw device-based tablespaces for source DB2 databases in their environments. To leverage these environments with Delphix, we have built a workflow using DB2s native tools that allow us to discover and convert a raw device-based tablespace into an automatic storage-based tablespace during ingestion. Once ingested, customers will be able to provision VDBs of the automatic storage-based database.

## Key Product Updates

Delphix has made a number of product changes that merit mentioning:

### Jackson JSON Library Update

There were several well-documented vulnerabilities in the open source [Jackson library](#) which we used in our SQL Server Virtualization connector. In this release, Delphix has updated to the latest stable version, Jackson Release 2.9.4.

### Masked Provisioning User Experience Improvement:

In this release, Delphix has introduced the ability to mark VDBs as masked without selecting a masking job at the time of provisioning. This enables customers to provision masked VDBs and use Selective Data Distribution (SDD) without referencing a previously defined masking job. This simplifies the user workflow of masking a database using a hook script and allows customers using third-party masking tools to setup masked provisioning without requiring a Masking Engine.

### Multiple Recovery Paths for SQL Server

When a SQL Server database is restored, as in the case of disaster recovery or an error in the database instance, SQL Server generates a new recovery path. Support for multiple recovery paths enables customers to roll back SQL Server source databases and refresh VDBs from those sources within Delphix.

### User-click Analytics with Virtualization

- In Delphix 5.2.4, we are releasing the User-click Analytics feature that is a lightweight method to capture how users interact with our product's user interfaces.
- The goal behind capturing this data is to get a better understanding of product usage, engagement, and user behavior, and use this data to improve our product and customer experience.
- We will collect browser-based, user-click analytics data. Essentially, we will selectively track actions that a user takes in the product UI. We will not be collecting, transmitting or storing any personally identifiable information (PII) which for Enterprise customers includes information such as email address, IP address, username, etc
- This feature setting will match an Engine's Phone Home Service setting:
  - If the Phone Home Service is enabled on an Engine, then this feature will be enabled by default.
  - If the Phone Home Service is disabled on an Engine, then this feature will be disabled by default.
- If you want to opt-out please see these CLI instructions - [CLI Cookbook: Disabling User-click Analytics](#). The opt-out is not currently available in the GUI. Please note that we would like to encourage our customers to share this non-PII data with us.

### New Virtualization Certifications

The following Support Matrices have been updated to reflect updated certification of data sources and OS versions:

- Oracle 12.1 on Solaris 11 U3 SPARC

## Release 5.2.2

Delphix Dynamic Data Platform 5.2 introduces several major changes that will dramatically improve our customers' experience and expand functionality

### Core Virtualization Capabilities

- **New Delphix Management UI:** A completely revamped GUI simplifies the user experience. Highlights include:
  - **Flash no longer required** for the user interface.
  - **Improved navigation and page layout.**

- **Enhanced Timeflow** that allows easier review of snapshots.
- **Redesigned Capacity Management screen:** Quickly view which VDBs and snapshots are taking the most disk space for easier capacity management.
- **Dataset performance screen:** Clearer, easier way to monitor the health and performance of VDBs.
- **Consistent Performance:** UI performance as good or better than the 5.1 release
- **Improved Upgrade:** Several new features make upgrade much faster and simpler, progressing towards the long-term goal of self-service. Note: these features will only be available when upgrading from 5.2 to a future release, and our first rollout will still be driven with the help of Delphix Support.
  - **Automated rollback** to a stable point on failed upgrade.
  - **Automated check process** to prevent upgrading if Delphix is using a hotfix that the target upgrade does not contain.
  - **Built-in checks** prior to upgrade to help ensure the Delphix platform is configured and prepared properly to successfully upgrade.
- **TCP Congestion Control Algorithm Modernization:** Increased throughput for workloads such as replication and Snapsync where there are usually high latency and congested network paths.
- **Filesystem (ZFS) improvements:** A number of ZFS-level changes will improve I/O performance, particularly on VDBs which have heavy write workloads:
  - **Lower latency** for multiple synchronous write, especially under heavy workloads. Most writes to VDBs are synchronous.
  - **Improved performance for high-IOPS workloads**, which are common on all-SSD systems. Helps especially with a high number of vCPUs, and on cached reads and asynchronous writes (most writes to dSources are asynchronous).
- **Password Security:** Ability for customers to define login password requirements along multiple variables including length, capitalization, and symbols.
- **vSphere 6.5:** Running the Delphix platform on VMware vSphere 6.5 is now fully supported.

## Data Virtualization Connectors

- **Oracle**
  - **Removing support for Oracle 9i:** Version 5.2 will no longer support Oracle 9i.
  - **Introducing Virtual CDB (vCDB) Support:** Traditional support for existing 12c MT operations required a physical CDB to be created in the target host (by the DBA) to provision vPDBs into. In addition to the manual overhead of creating a physical CDB, users could encounter provisioning errors due to incompatibilities, storage consumption on the target host, and administrative overhead for creating and managing the physical CDBs. By introducing the concept of a virtual CDB (vCDB) Delphix enables customers to provision a vPDB along with its underlying vCDB in a single provisioning workflow.
  - **PDB Attach/Detach:** There are several common scenarios where a source environment may move, such as host failover or disaster recovery. Within Oracle 12c MT, there is additional functionality to move a PDB from one CDB to another. Without Attach/Detach, there is no way to instruct the Delphix platform to follow the PDB: the “moved” PDB must be relinked to create a new dSource. In addition to being an expensive operation, relinking a PDB complicates database management, reduces storage savings and prolongs sync time.

PDBs can now be managed in such a way that they can be “moved” to a different environment and the Delphix platform will track those movements automatically. PDB Attach/Detach enables customers pointing the Delphix platform to the new location to gather incremental data for the PDB dSource and have continuity in their operations. A PDB may “move” in many different ways. Some examples are below:



- The PDB is unplugged from its CDB and plugged into a different CDB
  - The PDB and its constituent CDB are failed over to a different host that was previously a standby database
  - Swap linking from DataGuard primary PDB to DataGuard standby PDB
- **Automatic vCDB Restart on Target Host Reboot:** Similar to the VDB auto-restart functionality, we will be adding support for the automatic vCDB restart for customers using multi-tenant configurations.
  - **Remove dependency on 32-bit glibc and move to 64-bit glibc support:** Oracle periodically releases patches for Exadata. These patches can uninstall the non-white listed packages such as 32-bit glibc which results in Delphix failures. We will be eliminating the need for 32-bit glibc packages and moving to 64-bit glibc support.
  - **Enhanced Local Listener Support:** An Oracle listener is a server process that listens for incoming connections on one or more endpoints. Oracle database instances and services register with one or more listeners (via their endpoints) on database startup. To connect to these databases, clients first connect to one of the listener endpoints, whereupon the listener forwards the request accordingly. Frequently, security protocol requires using only the IPC protocol to set up their local\_listener init parameter. This is a measure customers use to restrict registering their Oracle DB (including their VDBs provisioned from Delphix) to only use IPC local protocol to contact the local listener. This can help them to avoid dealing with the 'Oracle TNS Listener Attack' security bug. This feature adds support for IPC local listeners for the single instance (non-RAC) case. In total, we will support the discovery of TCP, TCPS, and IPC.
  - **Discovery over DSP:** The long-term goal for Delphix is to use DSP for all source and target operations. This addresses the concerns of our security-conscious customers who would like to leverage DSP for Delphix operations. As a first step, we built out support for SnapSync on DSP. In the 5.2 timeframe, we are adding support for Discovery over DSP.
- **DB2**
    - **Instance to DB-level Support:** DB2 on Delphix was initially designed to work at the Instance-level: an instance is a collection of DB2 databases. In addition to deviating from the design of our other supported data sources, this design had several challenges including management overhead in terms of setup and operations as well as technical limitations in areas such as provisioning, renaming of VDBs, etc. For 5.2, we will be removing this limitation and moving DB2 operations to the database-level. This enhancement would provide our customers with simplified administration and operations of the DB2 VDBs. It is important to note that we will not be providing customers with an upgrade path between the instance and the DB level which may lead to data loss, and impact on business continuity. In order to ensure our customers have a smooth transition, we will assist in our customers in this migration journey.
    - **DB2 BLU:** DB2 BLU is a collection of technologies for analytical database workloads. BLU Acceleration design integrates different technologies including in-memory processing of columnar data, Actionable Compression, CPU Acceleration, Data Skipping. Virtualization of DB2 BLU with Delphix provides customers with not only storage savings but with agility, integration and federated DB support. Customers have expressed use cases where they leverage the self-service capabilities of JetStream to integrate data from different data sources such as DB2 (BLU and Non-BLU), SQL Server, etc.
    - **Deprecation:** In 5.2, we will be deprecating support for DB2 10.1 and AIX 6.1 as IBM has removed support for these versions.
    - **Certifications:** In all Delphix releases, we introduce support for new data source / operating system versions. The following combinations are certified in 5.2:
      - DB2 10.5 with RHEL 6.9
      - DB2 10.5 with RHEL 7.4
      - DB2 10.5 with AIX 7.2
      - DB2 11.1 with RHEL 6.9
      - DB2 11.1 with AIX 7.
- **SQL Server**
    - **Removing support for Windows Server 2003:** Version 5.2 will no longer support Windows Server 2003.
    - **Compressed Copy-Only Backups:** Customers can now compress their copy-only backups when linking a dSource or taking a snapshot, allowing them to save even more space on their backups taken with Delphix.
- **Oracle EBS**
    - **EBS Apps Password Management:** This feature would address the long-standing

issue of password management with EBS in Delphix. The end to end workflow consists of provisioning from production, changing the APPS password in the source and updating Delphix's copy of the password. The solution consists of obtaining the apps password for dSource snapshot and saving it as per-snapshot metadata. We would explicitly test that the password provided is valid as most EBS preclone utilities don't require a password or don't validate it. When provisioning, Delphix would use the password from a snapshot

- **Validate EBS credentials** at the beginning of operations: EBS provision/snapshot would sometimes not validate the credentials provided (ex. APPS, Weblogic) until it is actually being used which might belong down the way. In some cases, the scripts would fail with a cryptic error or abruptly. This Feature would validate the credentials provided earlier in the process and error out with an understandable message to the end user.
- **SAP ASE**
  - Removing support for ASE 12.5: Version 5.2 will no longer support ASE 12.5.
  - Certifications: In all Delphix releases, we introduce support for new data source / operating system versions. The following combination is certified in 5.2:
    - ASE 15.7 with AIX 7.2

## Delphix Self-Service (formerly known as Jet Stream)

- **Improvements of Error Messaging:** users will be provided with more clear error messages. These improvements will help end users understand what error occurred and what steps they should take to resolve their issue.
- **Automatic Retries for Self-Service Operations:** In order to make self-service operations more robust, we have implemented an automatic retry feature when there are failures. This feature will improve the user experience by significantly reducing the probability of containers left in an error after using them.
- **Bookmark Default Expiry Policy:** admins are now able to set a default expiration date for all new bookmarks. This feature enables users to better manage their space utilization by making sure the expiration date is auto-filled when creating new bookmarks.

## Delphix Masking Capabilities

- **New Masking Wizard:** We're introducing a new masking wizard that will be the first experience users have when they use Delphix. The goals of this wizard include:
  - Enabling first-time users to easily complete their initial masking job and see the results of sensitive fields being masked.
  - Enabling seasoned users to get jobs done faster.
  - Taking a first step towards dramatically simplifying and automating the process of data masking.
- **Completely New API:** We're introducing a completely new masking API that will allow programmatic control and masking at scale. This API is a major step forward to enabling true integration of masking into enterprise development and CI / CD workflows and to more easily deploy masking enterprise-wide. The API functionality that will be shipping in 5.2 includes:
  - Masking/Profile Job Control
  - Database/File Connector Control
  - Environment Control
  - Application Control
  - Profile Set/Profile Expression Control
  - Domain Control
  - Ruleset Control
- **Masking Algorithm Synchronization:** One of the major features of our masking product is our ability to maintain referential integrity (for example first name "Tom" is always changed to "Kevin") while masking. Until now, this has only been the case for single masking engine deployments, not when deploying multiple masking engines. In 5.2 we are introducing the ability to have consistent masking output across multiple engines (no limit to the quantity) when using the following algorithms:
  - Secure Lookup
  - Binary Lookup
  - Date Shift Discrete
  - Tokenization
  - Segmented Mapping
  - Some custom algorithms (maplets) (Please work with your services team to verify)
- **Other Masking Features**
  - **New Welcome Screen:** We're introducing new masking login and welcome screens. These new screens have a modern design

- and offer a set of tools to help users get started with masking. These new screens include:
  - New instructional video - walking users through the masking wizard as well as the traditional masking UI.
  - Links to important documentation - getting started guide and quick start guide.
  - Link directly to the new Masking Wizard - letting users immediately get started creating a masking job.
- **New forgotten password workflow:** Allows users to reset forgotten passwords without needing to contact their administrator (or Delphix).
- **Disable Constraints for SAP ASE (Sybase):** The “Disable Constraints” option will now be available when running an ASE (Sybase) masking job. This makes it possible to mask tables with certain foreign key constraints.
- **Split application logs:** Applications logs have now been split into different user-visible messages and developer-targeted logs. This enhancement makes it easier for support and users to find the log data they need to diagnose a problem.
- **Removal of connector limits:** It is now possible to create an unlimited amount of connectors. Previously, this required opening a support case to go over 100.
- **Performance optimizations for identity columns without an index:** There have been several performance improvements across relational databases.
- **SQL Server Deadlock:** There have been several performance improvements for Microsoft SQL Server to avoid deadlock
- **VSAM support for custom algorithms (mapplets):** We have added the ability to apply custom algorithms (mapplets) to VSAM files.
- **Removal of outdated custom algorithms (mapplets):** We determined that some mapplets in the product are outdated and should not be used by customers. The following mapplets will be removed from the product:
  - DATE\_SHIFT\_VARCHAR\_DATE
  - FREE TEXT MASKING
  - FREE\_TEXT\_REDACTOR
  - INCLUSION\_MAPPLET
- **Removal of unsupported connectors:** We will remove many legacy, unsupported connectors from the Masking UI to correspond with our [Masking Support Matrix](#). This discrepancy between our support matrix and the connectors listed in the product has previously caused confusion.
- **SMTP Settings in UI:** Users will now be able to configure their SMTP directly through the Masking Admin UI instead of having to contact support.
- **General Security Enhancements:** Variety of security enhancements around components like user passwords and connector credentials.

## Migration and Compatibility

- [Upgrade Matrix](#)
- [Supported Oracle DBMS Versions and Operating Systems for Source and Target Environments](#)
- [Supported SAP ASE Versions and Operating Systems](#)
- [Supported SQL Server Versions, Operating Systems, and Backup Software](#)

## Upgrade Matrix

### 5.2 Upgrade Matrix

Upgrades to Delphix Engine 5.2 are supported from 5.0.0.0 and above.

	5.2.2.0	5.2.2.1	5.2.3.0	5.2.3.1	5.2.4.0	5.2.5.0
4.3 and prior						
5.0 - 5.1						
5.2.2.0						
5.2.2.1						
5.2.3.0						
5.2.3.1						
5.2.4.0						

Key:

Color	Supported?	VDB Downtime Required? <sup>1</sup>
	No	N/A
	Yes	Required

	Yes	Not Required
	Yes	Optional <sup>2</sup>

1. VDB Downtime is caused by a reboot of the Delphix Engine when DelphixOS is modified by an upgrade.
2. VDB Downtime may be optional for an upgrade when a release contains DelphixOS changes that are also optional. In such a scenario, the DelphixOS changes may be deferred (see documentation on [Deferred OS Upgrade](#)).

## Tested Browser Configuration Matrix

OS Supported	Browsers Supported	Minimum Memory
Windows 10	Internet Explorer 11.x, Firefox, Chrome	4GB
Windows 8.1	Internet Explorer 11.x, Firefox, Chrome	4GB
Windows 7	Internet Explorer 11.x, Firefox, Chrome	4GB
Mac OS X	Firefox, Chrome	4GB

## Supported Oracle DBMS Versions and Operating Systems for Source and Target Environments

### Source and Target OS and DBMS Compatibility

The source and target must be running the same DBMS/Operating System combination (for example, Oracle 10.2.0.4 on RHEL 5.2) in order to successfully provision a VDB to the target. If the DBMS versions are compatible, the OS version on a target host can be different from the OS version on the source host.

## Supported DBMS Versions

- Oracle 9.2.0.8
- Oracle 10.2
- Oracle 11.1
- Oracle 11.2
- Oracle 12.1
- Oracle 12.2

### Oracle 9.2.0.8

The Delphix Engine has limited support for Oracle 9.2.0.8 and cannot link to a database that has a compatibility setting lower than 9.2.0.8.

Delphix features supported with Oracle 9.2.0.8:

	dSource	VDB
SnapSync	Yes	No
LogSync	No	No
Rewind	Not Applicable	No
V2P (virtual to physical)	Yes	No
RAC	No	No

Standby Database	No	No
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**Oracle 10.2.0.4**

The Delphix Engine does not support Oracle 10.2.0.4 databases using Automatic Storage Management (ASM) that do not have the patch set for Oracle Bug 7207932. This bug is fixed in patch set 10.2.0.4.2 onward.

**Supported Operating Systems**

Support applies to corresponding versions of Community Enterprise Operating System (CentOS) / Oracle Linux (OL).

64-bit OS support only.

**Red Hat Enterprise Linux (RHEL)**

Supported DBMS Version	Oracle 10g	Oracle 11gR1	Oracle 11gR2	Oracle 12cR1	Oracle 12cR2
Supported OS Version					
RHEL 4.7	Supported	Supported	Supported	N/A	N/A
RHEL 4.8	Supported	Supported	Supported	N/A	N/A
RHEL 4.9	Supported	Supported	Supported	N/A	N/A
RHEL 5.0	Not Supported	Not Supported	N/A	N/A	N/A
RHEL 5.1	Not Supported	Not Supported	N/A	N/A	N/A
RHEL 5.2	Not Supported	Not Supported	Not Supported	N/A	N/A
RHEL 5.3	Supported	Supported	Supported	N/A	N/A
RHEL 5.4	Supported	Supported	Supported	N/A	N/A
RHEL 5.5	Supported	Supported	Supported	N/A	N/A
RHEL 5.6	Supported	Supported	Supported	Supported	N/A
RHEL 5.7	Supported	Supported	Supported	Supported	N/A
RHEL 5.8	Supported	Supported	Supported	Supported	N/A
RHEL 5.9	Supported	Supported	Supported	Supported	N/A
RHEL 5.10	Supported	Supported	Supported	Supported	N/A
RHEL 5.11	Supported	Supported	Supported	Supported	N/A
RHEL 6.0	N/A	N/A	Supported	Supported	N/A
RHEL 6.1	N/A	N/A	Supported	Supported	N/A
RHEL 6.2	N/A	N/A	Supported	Supported	N/A
RHEL 6.3	N/A	N/A	Supported	Supported	N/A
RHEL 6.4	N/A	N/A	Supported	Supported	Supported
RHEL 6.5	N/A	N/A	Supported	Supported	Supported
RHEL 6.6	N/A	N/A	Supported	Supported	Supported
RHEL 6.7	N/A	N/A	Supported	Supported	Supported
RHEL 6.8	N/A	N/A	Supported	Supported	Supported
RHEL 6.9	N/A	N/A	Supported	Supported	Supported
RHEL 7.0	N/A	N/A	Supported	Supported	Supported
RHEL 7.1	N/A	N/A	Supported	Supported	Supported

RHEL 7.2	N/A	N/A	Supported	Supported	Supported
RHEL 7.3	N/A	N/A	Supported	Supported	Supported
RHEL 7.4	N/A	N/A	Supported	Supported	Supported

## SUSE Linux Enterprise Server (SLES)

Supported DBMS Version	Oracle 10g	Oracle 11gR1	Oracle 11gR2	Oracle 12cR1	Oracle 12cR2
<b>Supported OS Version</b>					
SLES 10	Supported	Supported	N/A	N/A	N/A
SLES 10 SP1	Supported	Supported	N/A	N/A	N/A
SLES 10 SP2	Supported	Supported	Supported	N/A	N/A
SLES 10 SP3	Supported	Supported	Supported	N/A	N/A
SLES 10 SP4	Not Supported	Not Supported	Not Supported	N/A	N/A
SLES 11	Supported	Supported	Supported	N/A	N/A
SLES 11 SP1	Supported	Supported	Supported	N/A	N/A
SLES 11 SP2	Supported	Supported	Supported	Supported	N/A
SLES 11 SP3	Supported	Supported	Supported	Supported	N/A
SLES 11 SP4	Not Supported	Not Supported	Supported	Supported	N/A
SLES 12	N/A	N/A	Supported	Supported	N/A
SLES 12 SP1	N/A	N/A	Supported	Supported	Supported
SLES 12 SP2	N/A	N/A	Supported	Supported	Supported

## Solaris SPARC

Supported DBMS Version	Oracle 10g	Oracle 11gR1	Oracle 11gR2	Oracle 12cR1	Oracle 12cR2
<b>Supported OS Version</b>					
Solaris 10	Supported	Supported	N/A	N/A	N/A
Solaris 10 U1	Supported	Supported	N/A	N/A	N/A
Solaris 10 U2	Supported	Supported	N/A	N/A	N/A
Solaris 10 U3	Supported	Supported	N/A	N/A	N/A
Solaris 10 U4	Supported	Supported	N/A	N/A	N/A
Solaris 10 U5	Supported	Supported	N/A	N/A	N/A
Solaris 10 U6	Supported	Supported	Supported	N/A	N/A
Solaris 10 U7	Supported	Supported	Supported	N/A	N/A
Solaris 10 U8	Supported	Supported	Supported	N/A	N/A
Solaris 10 U9	Supported	Supported	Supported	N/A	N/A
Solaris 10 U10	Supported	Supported	Supported	Supported	N/A
Solaris 10 U11	Supported	Supported	Supported	Supported	N/A
Solaris 11	N/A	N/A	Supported	Supported	N/A
Solaris 11 U1	N/A	N/A	Supported	Supported	N/A
Solaris 11 U2	N/A	N/A	Supported	Supported	Supported in 5.2.3

Solaris 11 U3	N/A	N/A	Not Supported	Supported in 5.2.4	Supported in 5.2.3
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## Solaris x86

Supported DBMS Version		Oracle 10g	Oracle 11gR1	Oracle 11gR2	Oracle 12cR1	Oracle 12cR2
Supported OS Version						
Solaris 10		Supported	Supported	N/A	N/A	N/A
Solaris 10 U1		Supported	Supported	N/A	N/A	N/A
Solaris 10 U2		Supported	Supported	N/A	N/A	N/A
Solaris 10 U3		Supported	Supported	N/A	N/A	N/A
Solaris 10 U4		Supported	Supported	N/A	N/A	N/A
Solaris 10 U5		Supported	Supported	N/A	N/A	N/A
Solaris 10 U6		Supported	Supported	Supported	N/A	N/A
Solaris 10 U7		Supported	Supported	Supported	N/A	N/A
Solaris 10 U8		Supported	Supported	Supported	N/A	N/A
Solaris 10 U9		Supported	Supported	Supported	N/A	N/A
Solaris 10 U10		Supported	Supported	Supported	Supported	N/A
Solaris 10 U11		Supported	Supported	Supported	Supported	N/A
Solaris 11		N/A	N/A	Supported	Supported	N/A
Solaris 11 U1		N/A	N/A	Supported	Supported	N/A
Solaris 11 U2		N/A	N/A	Supported	Supported	Supported
Solaris 11 U3		N/A	N/A	Not Supported	Supported	Supported

## Hewlett Packard Unix (HP-UX)

Supported DBMS Version		Oracle 10g	Oracle 11gR1	Oracle 11gR2	Oracle 12cR1	Oracle 12cR2
Supported OS Version						
HP-UX 11.31		Supported	Supported	Supported	Supported	Supported

## Advanced Interactive eXecutive (AIX)

Supported DBMS Version		Oracle 10g	Oracle 11gR1	Oracle 11gR2	Oracle 12cR1	Oracle 12cR2
Supported OS Version						
AIX 5.3		Supported	Supported	Supported	N/A	N/A
AIX 6.1		Supported	Supported	Supported	Supported	Not Supported
AIX 7.1		N/A	N/A	Supported	Supported	Supported
AIX 7.2		N/A	N/A	Supported	Supported	Supported

Delphix supports all 64-bit OS environments for source and target.

**Required HP-UX patch for Target Servers**

PHNE\_37851 - resolves a known bug in HP-UX NFS client prior to HP-UX 11.31.

**Supported SAP ASE Versions and Operating Systems**

This topic describes supported operating systems and database versions for SAP ASE.

**Supported Operating Systems and Database Versions for SAP ASE****Source and Target OS and DBMS Compatibility**

The source and target must be running the same DBMS/Operating System combination, (*although users can run different patch/sp levels*) in order to successfully provision a VDB to the target. For example, if the source is running SAP ASE 16, the target can be running ASE 16SP1. If the target is used as a staging server, the same rule applies. The Operating System platform must be the same between the source and target, even when the operating system version may differ. For example, if the source is running Red Hat Enterprise Linux 6.2 x86\_64 then the target could be running Red Hat Enterprise Linux 6.4 x86\_64, but not Solaris 10 SPARC.

64-bit OS support only

**Red Hat Enterprise Linux (RHEL)**

Supported DBMS Version	ASE 15.0.3	ASE 15.5	ASE 15.7	ASE 16*
<b>Supported OS Version</b>				
RHEL 5.0	Supported	Supported	N/A	N/A
RHEL 5.1	Supported	Supported	N/A	N/A
RHEL 5.2	Supported	Supported	N/A	N/A
RHEL 5.3	Supported	Supported	N/A	N/A
RHEL 5.4	Supported	Supported	N/A	N/A
RHEL 5.5	Supported	Supported	Supported	N/A
RHEL 5.6	Supported	Supported	Supported	N/A
RHEL 5.7	Supported	Supported	Supported	N/A
RHEL 5.8	Supported	Supported	Supported	N/A
RHEL 5.9	Supported	Supported	Supported	N/A
RHEL 5.10	Supported	Supported	Supported	N/A
RHEL 5.11	Supported	Supported	Supported	N/A
RHEL 6.0	Not Supported	Not Supported	Not Supported	N/A
RHEL 6.1	Not Supported	Not Supported	Not Supported	Not Supported
RHEL 6.2	Supported	Supported	Supported	Not Supported
RHEL 6.3	Supported	Supported	Supported	Not Supported
RHEL 6.4	Supported	Supported	Supported	Not Supported
RHEL 6.5	Not Supported	Supported	Supported	Supported
RHEL 6.6	Not Supported	Supported	Supported	Supported
RHEL 6.7	Not Supported	Supported	Supported	Supported
RHEL 6.8	Not Supported	Supported	Supported	Supported



RHEL 6.9	Not Supported	Supported	Supported	Supported
RHEL 7.0	N/A	N/A	Supported	Supported
RHEL 7.1	N/A	N/A	Supported	Supported
RHEL 7.2	N/A	N/A	Supported	Supported
RHEL 7.3	N/A	N/A	Supported	Supported
RHEL 7.4	N/A	N/A	Supported	Supported

\*ASE 16 SP02 PL05 and above is supported only on RHEL and only for Delphix versions 5.1.5 and above.

### SUSE Linux Enterprise Server (SLES)

Supported DBMS Version	ASE 15.0.3	ASE 15.5	ASE 15.7	ASE 16
<b>Supported OS Version</b>				
SLES 11	Supported	Not Supported	Not Supported	Not Supported
SLES 11 SP1	Supported	Not Supported	Not Supported	Not Supported
SLES 11 SP2	Supported	Not Supported	Not Supported	Not Supported
SLES 11 SP3	Supported	Not Supported	Not Supported	Not Supported
SLES 11 SP4	Supported	Not Supported	Not Supported	Not Supported
SLES 12	Not Supported	Not Supported	Not Supported	Not Supported
SLES 12 SP1	Not Supported	Not Supported	Not Supported	Not Supported

### Solaris Sparc

Supported DBMS Version	ASE 15.0.3	ASE 15.5	ASE 15.7	ASE 16
<b>Supported OS Version</b>				
Solaris 10	Supported	Supported	Supported	Not Supported
Solaris 10 U1	Supported	Supported	Supported	Not Supported
Solaris 10 U2	Supported	Supported	Supported	Not Supported
Solaris 10 U3	Supported	Supported	Supported	Not Supported
Solaris 10 U4	Supported	Supported	Supported	Not Supported
Solaris 10 U5	Supported	Supported	Supported	Not Supported
Solaris 10 U6	Supported	Supported	Supported	Not Supported
Solaris 10 U7	Supported	Supported	Supported	Not Supported
Solaris 10 U8	Supported	Supported	Supported	Not Supported
Solaris 10 U9	Supported	Supported	Supported	Not Supported
Solaris 10 U10	Supported	Supported	Supported	Not Supported
Solaris 10 U11	Supported	Supported	Supported	Not Supported
Solaris 11	Not Supported	Not Supported	Not Supported	Not Supported
Solaris 11 U1	Not Supported	Not Supported	Not Supported	Not Supported
Solaris 11 U2	Not Supported	Not Supported	Not Supported	Not Supported

Solaris 11 U3	Not Supported	Not Supported	Supported	Not Supported
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## Solaris x86

Supported DBMS Version	ASE 15.0.3	ASE 15.5	ASE 15.7	ASE 16
Supported OS Version				
Solaris 10	Supported	Supported	Supported	Not Supported
Solaris 10 U1	Supported	Supported	Supported	Not Supported
Solaris 10 U2	Supported	Supported	Supported	Not Supported
Solaris 10 U3	Supported	Supported	Supported	Not Supported
Solaris 10 U4	Supported	Supported	Supported	Not Supported
Solaris 10 U5	Supported	Supported	Supported	Not Supported
Solaris 10 U6	Supported	Supported	Supported	Not Supported
Solaris 10 U7	Supported	Supported	Supported	Not Supported
Solaris 10 U8	Supported	Supported	Supported	Not Supported
Solaris 10 U9	Supported	Supported	Supported	Not Supported
Solaris 10 U10	Supported	Supported	Supported	Not Supported
Solaris 10 U11	N/A	N/A	Not Supported	Not Supported
Solaris 11	N/A	N/A	Supported	Supported
Solaris 11 U1	N/A	N/A	Supported	Supported
Solaris 11 U2	N/A	N/A	Supported	Supported
Solaris 11 U3	N/A	N/A	Supported	Supported

## Hewlett Packard Unix (HP-UX)

Supported DBMS Version	ASE 15.0.3	ASE 15.5	ASE 15.7	ASE 16
Supported OS Version				
HP-UX 11.31	Not Supported	Not Supported	Not Supported	Not Supported

## Advanced Interactive eXecutive (AIX)

Supported DBMS Version	ASE 15.0.3	ASE 15.5	ASE 15.7	ASE 16
Supported OS Version				
AIX 6.1	Not Supported	Not Supported	Supported	Not Supported
AIX 7.1	Not Supported	Not Supported	Supported	Not Supported
AIX 7.2	Not Supported	Not Supported	Supported	Supported in 5.2.4+

## Related Links

- [SAP ASE Support and Requirements](#)
- [Network and Connectivity Requirements for SAP ASE Environments](#)

## Supported SQL Server Versions, Operating Systems, and Backup Software

Delphix only supports 64-bit operating systems.

### Windows Server

Supported DBMS Version	SQL Server 2005	SQL Server 2008	SQL Server 2008 R2	SQL Server 2012	SQL Server 2014	SQL Server 2016	SQL Server 2017
Supported OS Version							
Win 2008	Supported	Supported	Supported	Supported	Supported	N/A	N/A
Win 2008 SP2	Supported	Supported	Supported	Supported	Supported	N/A	N/A
Win 2008 R2	Supported	Supported	Supported	Supported	Supported	N/A	N/A
Win 2008 R2 SP1	Supported	Supported	Supported	Supported	Supported	N/A	N/A
Win 2012	N/A	Supported	Supported	Supported	Supported	Supported	Supported in 5.2.3+
Win 2012 R2	N/A	Supported	Supported	Supported	Supported	Supported	Supported in 5.2.3+
Win 2016	N/A	N/A	N/A	Supported	Supported	Supported	Supported in 5.2.3+

## Support Matrices

The following support matrices for Delphix Engines include support for new major versions of DB vendor as well as support across major OS versions. Additionally you will find the support matrix for the Delphix Masking Engine.

- [Oracle Support Matrix](#)
- [MS SQL Support Matrix](#)
- [SAP ASE Support Matrix](#)
- [DB2 Support Matrix](#)
- [Masking Data Source Support Matrix](#)
- [EBS Support Matrix](#)
- [HANA Support Matrix](#)
- [Virtualization Platform Support Matrix](#)

### Oracle Support Matrix

- [Red Hat Enterprise Linux \(RHEL\)](#)
- [SUSE Linux Enterprise Server \(SLES\)](#)
- [Solaris SPARC](#)
- [Solaris x86](#)
- [Hewlett Packard Unix \(HP-UX\)](#)
- [Advanced Interactive eXecutive \(AIX\)](#)

Support applies to corresponding versions of Community Enterprise Operating System (CentOS) / Oracle Linux (OL).

64-bit OS support only.

### Red Hat Enterprise Linux (RHEL)

Supported DBMS Version	Oracle 10g	Oracle 11gR1	Oracle 11gR2	Oracle 12cR1	Oracle 12cR2
Supported OS Version					
RHEL 4.7	Supported	Supported	Supported	N/A	N/A
RHEL 4.8	Supported	Supported	Supported	N/A	N/A
RHEL 4.9	Supported	Supported	Supported	N/A	N/A
RHEL 5.0	Not Supported	Not Supported	N/A	N/A	N/A
RHEL 5.1	Not Supported	Not Supported	N/A	N/A	N/A
RHEL 5.2	Not Supported	Not Supported	Not Supported	N/A	N/A
RHEL 5.3	Supported	Supported	Supported	N/A	N/A
RHEL 5.4	Supported	Supported	Supported	N/A	N/A
RHEL 5.5	Supported	Supported	Supported	N/A	N/A
RHEL 5.6	Supported	Supported	Supported	Supported	N/A
RHEL 5.7	Supported	Supported	Supported	Supported	N/A
RHEL 5.8	Supported	Supported	Supported	Supported	N/A
RHEL 5.9	Supported	Supported	Supported	Supported	N/A
RHEL 5.10	Supported	Supported	Supported	Supported	N/A
RHEL 5.11	Supported	Supported	Supported	Supported	N/A
RHEL 6.0	N/A	N/A	Supported	Supported	N/A
RHEL 6.1	N/A	N/A	Supported	Supported	N/A
RHEL 6.2	N/A	N/A	Supported	Supported	N/A
RHEL 6.3	N/A	N/A	Supported	Supported	N/A
RHEL 6.4	N/A	N/A	Supported	Supported	Supported
RHEL 6.5	N/A	N/A	Supported	Supported	Supported
RHEL 6.6	N/A	N/A	Supported	Supported	Supported
RHEL 6.7	N/A	N/A	Supported	Supported	Supported
RHEL 6.8	N/A	N/A	Supported	Supported	Supported
RHEL 6.9	N/A	N/A	Supported	Supported	Supported
RHEL 7.0	N/A	N/A	Supported	Supported	Supported
RHEL 7.1	N/A	N/A	Supported	Supported	Supported
RHEL 7.2	N/A	N/A	Supported	Supported	Supported
RHEL 7.3	N/A	N/A	Supported	Supported	Supported
RHEL 7.4	N/A	N/A	Supported	Supported	Supported

## SUSE Linux Enterprise Server (SLES)

Supported DBMS Version	Oracle 10g	Oracle 11gR1	Oracle 11gR2	Oracle 12cR1	Oracle 12cR2
Supported OS Version					
SLES 10	Supported	Supported	N/A	N/A	N/A
SLES 10 SP1	Supported	Supported	N/A	N/A	N/A
SLES 10 SP2	Supported	Supported	Supported	N/A	N/A
SLES 10 SP3	Supported	Supported	Supported	N/A	N/A
SLES 10 SP4	Not Supported	Not Supported	Not Supported	N/A	N/A

SLES 11	Supported	Supported	Supported	N/A	N/A
SLES 11 SP1	Supported	Supported	Supported	N/A	N/A
SLES 11 SP2	Supported	Supported	Supported	Supported	N/A
SLES 11 SP3	Supported	Supported	Supported	Supported	N/A
SLES 11 SP4	Not Supported	Not Supported	Supported	Supported	N/A
SLES 12	N/A	N/A	Supported	Supported	N/A
SLES 12 SP1	N/A	N/A	Supported	Supported	Supported
SLES 12 SP2	N/A	N/A	Supported	Supported	Supported

## Solaris SPARC

Supported DBMS Version	Oracle 10g	Oracle 11gR1	Oracle 11gR2	Oracle 12cR1	Oracle 12cR2
<b>Supported OS Version</b>					
Solaris 10	Supported	Supported	N/A	N/A	N/A
Solaris 10 U1	Supported	Supported	N/A	N/A	N/A
Solaris 10 U2	Supported	Supported	N/A	N/A	N/A
Solaris 10 U3	Supported	Supported	N/A	N/A	N/A
Solaris 10 U4	Supported	Supported	N/A	N/A	N/A
Solaris 10 U5	Supported	Supported	N/A	N/A	N/A
Solaris 10 U6	Supported	Supported	Supported	N/A	N/A
Solaris 10 U7	Supported	Supported	Supported	N/A	N/A
Solaris 10 U8	Supported	Supported	Supported	N/A	N/A
Solaris 10 U9	Supported	Supported	Supported	N/A	N/A
Solaris 10 U10	Supported	Supported	Supported	Supported	N/A
Solaris 10 U11	Supported	Supported	Supported	Supported	N/A
Solaris 11	N/A	N/A	Supported	Supported	N/A
Solaris 11 U1	N/A	N/A	Supported	Supported	N/A
Solaris 11 U2	N/A	N/A	Supported	Supported	Supported in 5.2.3
Solaris 11 U3	N/A	N/A	Not Supported	Supported in 5.2.4	Supported in 5.2.3

## Solaris x86

Supported DBMS Version	Oracle 10g	Oracle 11gR1	Oracle 11gR2	Oracle 12cR1	Oracle 12cR2
<b>Supported OS Version</b>					
Solaris 10	Supported	Supported	N/A	N/A	N/A
Solaris 10 U1	Supported	Supported	N/A	N/A	N/A
Solaris 10 U2	Supported	Supported	N/A	N/A	N/A
Solaris 10 U3	Supported	Supported	N/A	N/A	N/A
Solaris 10 U4	Supported	Supported	N/A	N/A	N/A
Solaris 10 U5	Supported	Supported	N/A	N/A	N/A
Solaris 10 U6	Supported	Supported	Supported	N/A	N/A

Solaris 10 U7	Supported	Supported	Supported	N/A	N/A
Solaris 10 U8	Supported	Supported	Supported	N/A	N/A
Solaris 10 U9	Supported	Supported	Supported	N/A	N/A
Solaris 10 U10	Supported	Supported	Supported	Supported	N/A
Solaris 10 U11	Supported	Supported	Supported	Supported	N/A
Solaris 11	N/A	N/A	Supported	Supported	N/A
Solaris 11 U1	N/A	N/A	Supported	Supported	N/A
Solaris 11 U2	N/A	N/A	Supported	Supported	Supported
Solaris 11 U3	N/A	N/A	Not Supported	Supported	Supported

## Hewlett Packard Unix (HP-UX)

Supported DBMS Version		Oracle 10g	Oracle 11gR1	Oracle 11gR2	Oracle 12cR1	Oracle 12cR2
	Supported OS Version					
	HP-UX 11.31	Supported	Supported	Supported	Supported	Supported

## Advanced Interactive eXecutive (AIX)

Supported DBMS Version		Oracle 10g	Oracle 11gR1	Oracle 11gR2	Oracle 12cR1	Oracle 12cR2
	Supported OS Version					
	AIX 5.3	Supported	Supported	Supported	N/A	N/A
	AIX 6.1	Supported	Supported	Supported	Supported	Not Supported
	AIX 7.1	N/A	N/A	Supported	Supported	Supported
	AIX 7.2	N/A	N/A	Supported	Supported	Supported

## MS SQL Support Matrix

- Windows Server

Delphix only supports 64-bit operating systems.

## Windows Server

Supported DBMS Version	SQL Server 2005	SQL Server 2008	SQL Server 2008 R2	SQL Server 2012	SQL Server 2014	SQL Server 2016	SQL Server 2017
Supported OS Version							
Win 2008	Supported	Supported	Supported	Supported	Supported	N/A	N/A
Win 2008 SP2	Supported	Supported	Supported	Supported	Supported	N/A	N/A
Win 2008 R2	Supported	Supported	Supported	Supported	Supported	N/A	N/A
Win 2008 R2 SP1	Supported	Supported	Supported	Supported	Supported	N/A	N/A

Win 2012	N/A	Supported	Supported	Supported	Supported	Supported	Supported in 5.2.3+
Win 2012 R2	N/A	Supported	Supported	Supported	Supported	Supported	Supported in 5.2.3+
Win 2016	N/A	N/A	N/A	Supported	Supported	Supported	Supported in 5.2.3+

## SAP ASE Support Matrix

- Red Hat Enterprise Linux (RHEL)
- SUSE Linux Enterprise Server (SLES)
- Solaris Sparc
- Solaris x86
- Hewlett Packard Unix (HP-UX)
- Advanced Interactive eXecutive (AIX)

64-bit OS support only

## Red Hat Enterprise Linux (RHEL)

Supported DBMS Version	ASE 15.0.3	ASE 15.5	ASE 15.7	ASE 16*
<b>Supported OS Version</b>				
RHEL 5.0	Supported	Supported	N/A	N/A
RHEL 5.1	Supported	Supported	N/A	N/A
RHEL 5.2	Supported	Supported	N/A	N/A
RHEL 5.3	Supported	Supported	N/A	N/A
RHEL 5.4	Supported	Supported	N/A	N/A
RHEL 5.5	Supported	Supported	Supported	N/A
RHEL 5.6	Supported	Supported	Supported	N/A
RHEL 5.7	Supported	Supported	Supported	N/A
RHEL 5.8	Supported	Supported	Supported	N/A
RHEL 5.9	Supported	Supported	Supported	N/A
RHEL 5.10	Supported	Supported	Supported	N/A
RHEL 5.11	Supported	Supported	Supported	N/A
RHEL 6.0	Not Supported	Not Supported	Not Supported	N/A
RHEL 6.1	Not Supported	Not Supported	Not Supported	Not Supported
RHEL 6.2	Supported	Supported	Supported	Not Supported
RHEL 6.3	Supported	Supported	Supported	Not Supported
RHEL 6.4	Supported	Supported	Supported	Not Supported
RHEL 6.5	Not Supported	Supported	Supported	Supported
RHEL 6.6	Not Supported	Supported	Supported	Supported
RHEL 6.7	Not Supported	Supported	Supported	Supported
RHEL 6.8	Not Supported	Supported	Supported	Supported
RHEL 6.9	Not Supported	Supported	Supported	Supported
RHEL 7.0	N/A	N/A	Supported	Supported
RHEL 7.1	N/A	N/A	Supported	Supported

RHEL 7.2	N/A	N/A	Supported	Supported
RHEL 7.3	N/A	N/A	Supported	Supported
RHEL 7.4	N/A	N/A	Supported	Supported

\*ASE 16 SP02 PL05 and above is supported only on RHEL and only for Delphix versions 5.1.5 and above.

## SUSE Linux Enterprise Server (SLES)

Supported DBMS Version	ASE 15.0.3	ASE 15.5	ASE 15.7	ASE 16
Supported OS Version				
SLES 11	Supported	Not Supported	Not Supported	Not Supported
SLES 11 SP1	Supported	Not Supported	Not Supported	Not Supported
SLES 11 SP2	Supported	Not Supported	Not Supported	Not Supported
SLES 11 SP3	Supported	Not Supported	Not Supported	Not Supported
SLES 11 SP4	Supported	Not Supported	Not Supported	Not Supported
SLES 12	Not Supported	Not Supported	Not Supported	Not Supported
SLES 12 SP1	Not Supported	Not Supported	Not Supported	Not Supported

## Solaris Sparc

Supported DBMS Version	ASE 15.0.3	ASE 15.5	ASE 15.7	ASE 16
Supported OS Version				
Solaris 10	Supported	Supported	Supported	Not Supported
Solaris 10 U1	Supported	Supported	Supported	Not Supported
Solaris 10 U2	Supported	Supported	Supported	Not Supported
Solaris 10 U3	Supported	Supported	Supported	Not Supported
Solaris 10 U4	Supported	Supported	Supported	Not Supported
Solaris 10 U5	Supported	Supported	Supported	Not Supported
Solaris 10 U6	Supported	Supported	Supported	Not Supported
Solaris 10 U7	Supported	Supported	Supported	Not Supported
Solaris 10 U8	Supported	Supported	Supported	Not Supported
Solaris 10 U9	Supported	Supported	Supported	Not Supported
Solaris 10 U10	Supported	Supported	Supported	Not Supported
Solaris 10 U11	Supported	Supported	Supported	Not Supported
Solaris 11	Not Supported	Not Supported	Not Supported	Not Supported
Solaris 11 U1	Not Supported	Not Supported	Not Supported	Not Supported
Solaris 11 U2	Not Supported	Not Supported	Not Supported	Not Supported
Solaris 11 U3	Not Supported	Not Supported	Supported	Not Supported



## Solaris x86

Supported DBMS Version	ASE 15.0.3	ASE 15.5	ASE 15.7	ASE 16
	Supported OS Version			
Solaris 10	Supported	Supported	Supported	Not Supported
Solaris 10 U1	Supported	Supported	Supported	Not Supported
Solaris 10 U2	Supported	Supported	Supported	Not Supported
Solaris 10 U3	Supported	Supported	Supported	Not Supported
Solaris 10 U4	Supported	Supported	Supported	Not Supported
Solaris 10 U5	Supported	Supported	Supported	Not Supported
Solaris 10 U6	Supported	Supported	Supported	Not Supported
Solaris 10 U7	Supported	Supported	Supported	Not Supported
Solaris 10 U8	Supported	Supported	Supported	Not Supported
Solaris 10 U9	Supported	Supported	Supported	Not Supported
Solaris 10 U10	Supported	Supported	Supported	Not Supported
Solaris 10 U11	N/A	N/A	Not Supported	Not Supported
Solaris 11	N/A	N/A	Supported	Supported
Solaris 11 U1	N/A	N/A	Supported	Supported
Solaris 11 U2	N/A	N/A	Supported	Supported
Solaris 11 U3	N/A	N/A	Supported	Supported

## Hewlett Packard Unix (HP-UX)

Supported DBMS Version	ASE 15.0.3	ASE 15.5	ASE 15.7	ASE 16
	Supported OS Version			
HP-UX 11.31	Not Supported	Not Supported	Not Supported	Not Supported

## Advanced Interactive eXecutive (AIX)

Supported DBMS Version	ASE 15.0.3	ASE 15.5	ASE 15.7	ASE 16
	Supported OS Version			
AIX 6.1	Not Supported	Not Supported	Supported	Not Supported
AIX 7.1	Not Supported	Not Supported	Supported	Not Supported
AIX 7.2	Not Supported	Not Supported	Supported	Supported in 5.2.4+

## DB2 Support Matrix

- Red Hat Enterprise Linux (RHEL)
- Advanced Interactive eXecutive (AIX)
- Toolkit/Delphix Engine Compatibility

1. ESE: Enterprise Server Edition
2. AESE: Advanced Enterprise Server Edition
3. As of Delphix Engine 5.1.6 - For the supported DB2 versions, Delphix supports the corresponding DB2 Developer edition where the vendor, IBM, supports it
4. 64-bit OS support only

## Red Hat Enterprise Linux (RHEL)

Supported DBMS Version		ESE 10.5	AESE 10.5	ESE 11.1	AESE 11.1
Supported OS Version					
RHEL 6.0		Not Supported	Not Supported	Not Supported	Not Supported
RHEL 6.1		Not Supported	Not Supported	Not Supported	Not Supported
RHEL 6.2		Not Supported	Not Supported	Not Supported	Not Supported
RHEL 6.3		Not Supported	Not Supported	Not Supported	Not Supported
RHEL 6.4		Supported	Supported	Not Supported	Not Supported
RHEL 6.5		Supported	Supported	Not Supported	Not Supported
RHEL 6.6		Supported	Supported	Not Supported	Not Supported
RHEL 6.7		Supported	Supported	Supported	Supported
RHEL 6.8		Supported	Supported	Supported	Supported
RHEL 6.9		Supported	Supported	Supported	Supported
RHEL 7.0		Supported	Supported	Supported	Supported
RHEL 7.1		Supported	Supported	Supported	Supported
RHEL 7.2		Supported	Supported	Supported	Supported
RHEL 7.3		Supported	Supported	Supported	Supported
RHEL 7.4		Supported	Supported	Supported	Supported

## Advanced Interactive eXecutive (AIX)

Supported DBMS Version		ESE 10.5	AESE 10.5	ESE 11.1	AESE 11.1
Supported OS Version					
AIX 6.1		Not Supported	Not Supported	N/A	N/A
AIX 7.1		Supported	Supported	Supported	Supported
AIX 7.2		Supported	Supported	Supported	Supported

## Toolkit/Delphix Engine Compatibility

Toolkits should be installed on compatible Delphix Engines per the table below:

Delphix Engine	DB2_2.0.1	DB2_2.1.0	DB2_2.2.1	DB2_2.3.0
5.1.x	No	No	No	No
5.2.2	Yes	No	No	No
5.2.3	No	Yes	Yes	Yes
5.2.4	No	Yes	Yes	Yes
5.2.5	No	Yes	Yes	Yes

## Unsupported DB2 Features

### Unsupported DB2 Versions and Features

- DB2 9.7 and below
- DB2 Database Partitioning Feature (DPF)
- DB2 pureScale
- DMS Raw Devices

## Masking Data Source Support Matrix

Data Source Type	Data Sources	Version	Linux	Unix	Windows
<b>Distributed Databases</b>	<b>DB2 UDB</b>	9.1	Supported	Supported	Supported
		9.5	Supported	Supported	Supported
		9.7	Supported	Supported	Supported
		9.8	Supported	Supported	Supported
		10.1	Supported	Supported	Supported
		10.5	Supported	Supported	Supported
		11.1	Supported	Supported	Supported
	<b>Oracle</b>	10g	Supported	Supported	Supported
		11gR1	Supported	Supported	Supported
		11gR2	Supported	Supported	Supported
		12c	Supported	Supported	Supported
		12cR2	Supported in 5.2.5	Supported in 5.2.5	Supported in 5.2.5
	<b>MS SQL Server</b>	2005	N/A	N/A	Supported
		2008	N/A	N/A	Supported
		2008 R2	N/A	N/A	Supported
		2012	N/A	N/A	Supported
		2014	N/A	N/A	Supported
		2016	Supported	N/A	Supported
	<b>MySQL</b>	5.5	Supported	Supported	Supported
		5.6	Supported	Supported	Supported
		5.7	Supported	Supported	Supported
	<b>SAP ASE (Sybase)</b>	12.5	Supported	Supported	Supported
		15.03	Supported	Supported	Supported
		15.5	Supported	Supported	Supported
		15.7	Supported	Supported	Supported
		16	Supported	Supported	Supported
	<b>PostgreSQL</b>	9.2	Supported	Supported	Supported
		9.3	Supported	Supported	Supported
		9.4	Supported	Supported	Supported
		9.5	Supported	Supported	Supported
<b>Maria DB</b>	10	Supported	Supported	Supported	

\* z/OS and iSeries are considered Premium Connectors and require an additional license. All other data sources are considered Standard Connectors.

Data Source Type	Data Sources	Version	z/OS	i-Series
Mainframe	DB2	7.1	N/A	Supported*
		7.2	N/A	Supported*
		7.3	N/A	Supported*
		9	Supported*	N/A
		10	Supported*	N/A
		11	Supported*	N/A
	VSAM		Supported*	N/A

Data Source Type	Data Sources	Version	Support Level
PaaS Databases	AWS RDS Oracle	11.2.04	Supported

Data Source Type	Data Sources	Support Level
Files	Excel (.xls & .xlsx)	Supported
	Fixed Width	Supported
	Delimited	Supported
	XML	Supported

## EBS Support Matrix

- Support applies to corresponding versions of Community Enterprise Operating System (CentOS) / Oracle Linux (OL)
- 64-bit OS support only

## Red Hat Enterprise Linux (RHEL)

Supported EBS Apps version		Oracle EBS 12.1	Oracle EBS 12.2
	Supported OS Version		
	RHEL 4.7	Supported	N/A
	RHEL 4.8	Supported	N/A
	RHEL 4.9	Supported	N/A
	RHEL 5.0	N/A	N/A
	RHEL 5.1	Supported	N/A
	RHEL 5.2	Supported	N/A
	RHEL 5.3	Supported	N/A

RHEL 5.4	Supported	N/A
RHEL 5.5	Supported	Supported
RHEL 5.6	Supported	Supported
RHEL 5.7	Supported	Supported
RHEL 5.8	Supported	Supported
RHEL 5.9	Supported	Supported
RHEL 5.10	Supported	Supported
RHEL 5.11	Supported	Supported
RHEL 6.0	Supported	N/A
RHEL 6.1	Supported	Supported
RHEL 6.2	Supported	Supported
RHEL 6.3	Supported	Supported
RHEL 6.4	Supported	Supported
RHEL 6.5	Supported	Supported
RHEL 6.6	Supported	Supported
RHEL 6.7	Supported	Supported
RHEL 6.8	Supported	Supported
RHEL 6.9	Supported	Supported
RHEL 7.0	Supported	Supported
RHEL 7.1	Supported	Supported
RHEL 7.2	Supported	Supported
RHEL 7.3	Not Supported	Not Supported

**Reference**

Oracle E-Business Suite Installation and Upgrade Notes Release 12 (12.1.1) for Linux x86-64 (Doc ID 761566.1)

Oracle E-Business Suite Installation and Upgrade Notes Release 12 (12.2) for Linux x86-64 (Doc ID 1330701.1)

**SUSE Linux Enterprise Server (SLES)**

Supported EBS Apps version	Oracle EBS 12.1	Oracle EBS 12.2
<b>Supported OS Version</b>		
SLES 10	Supported	N/A
SLES 10 SP1	Supported	N/A
SLES 10 SP2	Supported	Supported
SLES 10 SP3	Supported	Supported
SLES 10 SP	Supported	Supported
SLES 11	N/A	N/A
SLES 11 SP1	N/A	N/A

SLES 11 SP2	Supported	Supported
SLES 11 SP3	Supported	Supported
SLES 11 SP4	Supported	Supported
SLES 12	N/A	Not Supported
SLES 12 SP1	N/A	Not Supported
SLES 12 SP2	N/A	Not Supported

**Reference**

Oracle E-Business Suite Installation and Upgrade Notes Release 12 (12.1.1) for Linux x86-64 (Doc ID 761566.1)

Oracle E-Business Suite Installation and Upgrade Notes Release 12 (12.2) for Linux x86-64 (Doc ID 1330701.1)

**Solaris SPARC (x86 and SPARC)**

Supported DBMS Version		Oracle EBS 12.1	Oracle EBS 12.2
Supported OS Version			
Solaris 10 U6	Supported	N/A	
Solaris 10 U7	Supported	N/A	
Solaris 10 U8	Supported	N/A	
Solaris 10 U9	Supported	Supported	
Solaris 10 U10	Supported	Supported	
Solaris10 U11	Supported	Supported	
Solaris 10 U12	Supported	Supported	
Solaris 10 U13	Not Supported	Not Supported	
Solaris 11	Supported	Supported	
Solaris 11 U1	Supported	Supported	
Solaris 11 U2	Supported	Supported	
Solaris 11 U3	Not Supported	Not Supported	

**Reference**

R12.1.1: Oracle E-Business Suite Installation and Upgrade Notes Release 12 (12.1.1) for Oracle Solaris on SPARC (64-bit) (Doc ID 761568.1)

Oracle E-Business Suite Installation and Upgrade Notes Release 12 (12.2) for Oracle Solaris on SPARC (64-bit) (Doc ID 1330702.1)

**Advanced Interactive eXecutive (AIX)**

Supported EBS Apps version	Oracle EBS 12.1	Oracle EBS 12.2
Supported OS Version		
AIX 7.1	Supported in 5.1.7+ (single-node only)	Not Supported

## Toolkit/Delphix Engine Compatibility

Toolkits should be installed on compatible Delphix Engines per the table below:

Delphix Engine	EBS_1.2.0	EBS_1.3.0
5.1.x	No	No
5.2.2.x	No	No
5.2.3.x	Yes	Yes
5.2.4.x	Yes	Yes
5.2.5.x	Yes	Yes

### Unsupported EBS Versions and Features

- Sudo Privilege
- Weblogic Password Change
- Support SSL enabled Environment
- V2P

## HANA Support Matrix

### Supported Operating Systems

- 64-bit OS support only
- Support for x86-based systems only

### Red Hat Enterprise Linux (RHEL)

Supported DBMS Version		HANA 1.0 SPS12
Supported OS Version		
RHEL 7.0		Supported
RHEL 7.1		Supported
RHEL 7.2		Supported
RHEL 7.3		Supported
RHEL 7.4		Supported

### SUSE Linux Enterprise Server (SLES)

Supported DBMS Version		HANA 1.0 SPS12
Supported OS Version		
SLES 12 SP3		Supported

### Delphix Engine Toolkit Compatibility

Delphix Engine Version	HANA_1.0 SPS 12
------------------------	-----------------

5.1.x	No
5.2.2.x	No
5.2.3.x	No
5.2.4.x	Yes
5.2.5.x	Yes

### Unsupported HANA Versions and Features

- HANA 1.0 MDC configuration is not supported with this release.
- HANA 2.0 is not supported with this release.
- V2P is not supported with this release.
- If the logs creation process has been disabled explicitly then the replication will not work.
- XSEngine should not be installed on the HANA DB.
- HANA License should be installed on source and target boxes.
- Delphix Self-Service is not supported with 1.1.0 toolkit release.

## Virtualization Platform Support Matrix

### Legend

Color	Meaning
	Supported
	Not Supported
	Not Applicable

## Delphix Features with Data Platforms

This section describes the Delphix features we support for each data platform.

Delphix Feature		Oracle				SQL Server					SAP ASE			
		10g	11g	12c	PDB	2005	2008	2012	2016	2017	15.0.3	15.5	15.7	16
<b>Environment Management</b>	Manual environment discovery													
	Automated environment discovery													
	Hostchecker													
	Environment monitor													
<b>Linking/Syncing</b>	Load from existing backup													
	Incremental snapshots													
	Resumable syncs for initial load													
	dSource LogSync													
	Linking clustered source databases													
	Validated Sync on snapshot													
	Validated Sync, continuous													
	Load from alternate sources													
	VDB LogSync													
	Source Continuity													
	Handling of source DB upgrades													
Handling of non-logged changes														
<b>Provisioning</b>	VDB on VDB													
	VDB refresh and rewind													
	Provisioning clustered VDBs													
	VDB migration													
	VDB upgrades outside of Delphix													



	Automated VDB upgrades with Delphix																		
	Database config parameters for VDBs																		
	Path-mapping																		
	Cross-platform provisioning																		
<b>V2P</b>	Basic V2P data export																		
	V2P over DSP																		
	Multi filesystem V2P																		
	Resumable V2P																		

## Data Platform Features

This section describes the data platform specific features we support for each use case within Delphix.

### Oracle

Platform Feature		Oracle		
		10g	11g	12c
<b>dSource Linking</b>	Single Instance			
	CDB with PDB Multi-Tenant			
<b>dSource SnapSync</b>	Level based backups			
	SCN based backups			
	Physical Standby			
	Active Dataguard			
	ASM			
	RAC			
	TDE			
	HCC			
	Exadata			
	<b>dSource LogSync</b>	RAC		
ASM FS				
RAW FS				
Native FS				
Physical Standby				
<b>VDB</b>	Single Instance			
	RAC			

### SQL Server

Delphix Feature		SQL Server				
		2005	2008	2012	2016	2017
<b>Linking and Syncing</b>	Linking from clustered sources					
	Full and bulk-logged mode support					
	Simple mode support					
	Filestreams					

	Full text catalogs						
	Availability groups						
<b>Backup Software</b>	Native backups						
	Litespeed SQL Server backups						
	Red Gate SQL Backup Pro						
	NetBackup						
	Commvault						
<b>Provisioning</b>	Clustered VDBs						
	Availability Groups						

## SAP ASE

Delphix Feature		SAP ASE			
		15.0.3	15.5	15.7	16
<b>Linking and Syncing</b>	Linking from clustered sources				
	Linking from ASE replication server				
	Full mode support				
	Truncate log on checkpoint support				
	Native backups				
	NetBackup				
<b>Provisioning</b>	Clustered VDBs				
	VDB LogSync				

## Fixed Issues

- [Release 5.2.5.0 Changes](#)
  - [Management Server Fixes](#)
  - [Masking Fixes](#)
  - [Delphix OS Fixes](#)
- [Release 5.2.4.0 Changes](#)
  - [Management Server Fixes](#)
  - [Masking Fixes](#)
  - [Delphix OS Fixes](#)
- [Release 5.2.3.1 Changes](#)
  - [Management Server Fixes](#)
- [Release 5.2.3.0 Changes](#)
  - [Management Server Fixes](#)
  - [Masking Fixes](#)
  - [Delphix OS Fixes](#)
- [Release 5.2.2.1 Changes](#)
  - [Management Server Fixes](#)

## Release 5.2.5.0 Changes

### Management Server Fixes

Bug Number	Description
DLPX-56832	Updating NTP source information no longer triggers a reboot of the Delphix Engine.
DLPX-57899	Fixed an issue that caused informational upgrade messages to show as warnings.

DLPX-58131	Performance fine-tuning on the EC2 platform.
DLPX-58180	Updated Tomcat for the latest bug and security fixes.
DLPX-58182	Fixed an issue that caused improper tracking of authentication lockouts.
DLPX-58276	Fixed an issue where a thread needlessly opened multiple Postgres connections.
DLPX-58372	Addressed degrading UI performance over time with multiple concurrent jobs.
DLPX-58450	Updated the Jackson XML library to pick up new bug fixes and security improvements.
DLPX-58497	Fixed an issue that caused IE to attempt to open a support bundle instead of downloading it.
DLPX-58508	HADR status for DB2 is now correctly shown in the UI.
DLPX-58515	Update Masked Provisioning to use the Masking V5 API.
DLPX-58540	Added support for Oracle 12c in integrated Masked Provisioning.
DLPX-58548	Fix the issue where disks were not initialized after installation
DLPX-58568	Fixed an issue where passwordless SSH did not work under certain circumstances.
DLPX-58577	Provisioning from replica failed due to an incompatible toolkit.
DLPX-58717	Mask encryption key for SQL Server backups.
DLPX-58751	Improve UI performance for an engine that has a huge number of objects

## Masking Fixes

Bug Number	Description
DLPX-55376	Removed Type, Mask, and Domain columns from the inventory page so that longer column names can be displayed.
DLPX-57456	Visibility of local file connectors is controlled with a feature flag that is disabled by default.
DLPX-57543	Correctly handled TIMESTAMP values in DB2 z/OS on-the-fly masking jobs.
DLPX-57711	Allowed a composite logical key to be entered via the GUI.
DLPX-57743	Fixed an issue where refreshing a Rule Set caused the GUI to logout.
DLPX-58016	Optimized the number of queries used by data level profiling to significantly improve performance.
DLPX-58025	Visibility of local file format import is controlled with a feature flag that is disabled by default.
DLPX-58049	Output a message to the application log when a job contains one or more custom algorithms (mapplets).
DLPX-58050	User interface improvements for custom algorithms (mapplets).
DLPX-58150	No longer apply special character checks to tableName fields in the V5 API.
DLPX-58203	Fixed an issue with the update table metadata V5 API, PUT /table-metadata/{tableMetadataId}, that caused the rule set to be unusable.
DLPX-58306	Added support for LDAP authentication over TLS/SSL in Masking.
DLPX-58360	Added a feature that allows ruleset refresh to delete tables from the ruleset if they do not exist in the external database. This feature must be opted into via the v5 REST API.
DLPX-58361	Fixed an issue where ruleset refresh could hang. Ruleset refresh will now complete and log an error instead in those cases.
DLPX-58537	Fixed an issue displaying an inventory with table names with non-ASCII characters.

## Delphix OS Fixes

Bug Number	Description
DLPX-57738	Fixed a bug that caused temp filesystem to fail to mount with permissions denied on VDB provisioning or refresh.
DLPX-57829	Fixed an internal error that occurred when running storage test in AWS.
DLPX-58474	Fixed a problem that caused the system to run out of memory when SNMP is enabled.

## Release 5.2.4.0 Changes

### Management Server Fixes

Bug Number	Description
DLPX-56153	Additional navigation link added to Self-Service Data Operations page to help users to quickly find their containers.
DLPX-56946	The capability to use a VDB in a Self-Service data container and a data template at the same time was added.
DLPX-56968	Fixed an issue that caused factory reset to fail for Masking.
DLPX-57012	The masked provisioning process supports masking jobs with advanced connectors.
DLPX-57086	Fixed an issue where storage scrub caused the management service to fail.
DLPX-57136	Fixed an issue where the Self-Service timeline can be cut off on narrow browser windows.
DLPX-57145	Fixed an issue where Self-Service user sessions timed out too soon.
DLPX-57153	Provided a mechanism for a customer to disable usage analytics collection.
DLPX-57158	Race condition sometimes prevented the administrator from seeing Audit events of all users.
DLPX-57227	If the authentication type is set to 'LDAP', instead of just the locale, all 'User Details' fields are populated.
DLPX-57240	Datafiles backups created by RMAN due to a SnapSync are marked as Unavailable, however, the backup of the controlfile was not marked unavailable. Avoid using the Delphix controlfile backups.
DLPX-57243	Initial server setup failed due to DNS domain.
DLPX-57261	Removed some information about Delphix use of third party software from exposed areas.
DLPX-57277	The dSource wizard was stuck at loading message.
DLPX-57295	Hooks and other customer supplied scripts should avoid writing excessive amounts of output, as the output can cause later queries for job information to run out of memory.
DLPX-57296	Improved Self-Service UI responsiveness when resizing the page.
DLPX-57297	Revised the Self-Service UI to improve memory performance on the Timeline page.
DLPX-57323	Fixed an issue where SSH authentication failure resulted in leaked "heartbeat" threads.
DLPX-57372	Users can create masked VDBs using configure clone scripts without the need to specify a dummy masking job.
DLPX-57449	Fixed an issue where IE users get logged out of Self-Service earlier than the correct session expiration.
DLPX-57540	Fixed an issue where upgrade failed when trying to cleanup state from failed SDD replication runs.
DLPX-57577	Refresh policies dialog now has the option to allow selection between "Latest snapshot" and "Latest timeflow logs".
DLPX-57627	In the UI the Policy timeout value was labeled as being in minutes but was being interpreted as seconds in the underlying implementation.
DLPX-57696	Cannot edit or create refresh policy if there is a VDB is used in Self-Service as a data container.
DLPX-57710	Fixed a problem that prevented DelphixOS from booting in some EC2 r4 instance types.
DLPX-57722	Fixed a problem that lead to a loss of jumbo frames configuration after upgrade to 5.2.

DLPX-57736	Fixed a problem that lead to the loss of open-vm-tools after upgrade to 5.2.
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## Masking Fixes

Bug Number	Description
DLPX-55840	Fixed an issue when running an on-the-fly masking job with a standard SAP ASE connector as the source and a generic SAP ASE connector as the target.
DLPX-56825	Data level profiling failed when a database table column's name was a Javascript keyword.
DLPX-57045	Corrected a documentation error on the v5 APIs connectionMode enumeration.
DLPX-57102	Functional and visual improvements to the file format upload GUI, uploading from client browser supported for Copybook and XML formats. If any visual anomalies are observed, the web browser cache should be cleared.
DLPX-57140	Fixed an issue that caused the executions endpoint to encounter a null pointer exception.
DLPX-57177	Added support for running Tokenization/Reidentification jobs to the /executions V5 API.
DLPX-57292	Corrected an issue were some table rows were lost during an on-the-fly database masking job that included a custom algorithm using branching logic.
DLPX-57306	Fixed an issue that caused data level profiling to fail when a database column name contained special characters.
DLPX-57307	Fixed an issue that caused data level profiling to fail when COUNT_QUERY_FOR_DATA_LEVEL_PROFILING=Y and object owner is not same as schema in the connector.
DLPX-57327	Column level profiling performance had regressed, but it is now significantly improved.
DLPX-57369	Improved the performance of data level profiling.
DLPX-57398	Added Kerberos authentication for Oracle connectors.
DLPX-57452	Exposed additional configuration properties through the V5 application settings API.
DLPX-57467	Deleted job definition files from the file system when a job was deleted.
DLPX-57482	Allow the ETL engine's maximum stack size to be configured by Support.
DLPX-57547	Correctly quote schema name in data level profiling count queries.
DLPX-57563	Fixed a bug that prevented the ID method field from being set properly when importing an inventory.
DLPX-57622	Updated the URL of the Masking welcome screen Quick Start Guide link.
DLPX-57694	Updated text on HTTP error response pages from both GUI and REST APIs.

## Delphix OS Fixes

Bug number	Description
DLPX-56406	SQL Server VDB on failover cluster went into suspect mode during periods of high load.

## Release 5.2.3.1 Changes

### Management Server Fixes

Bug Number	Description
DLPX-57417	Bug fix to improve quality of upgrade when using a VDB in multiple Self Service data templates

## Release 5.2.3.0 Changes

### Management Server Fixes

Bug Number	Description
DLPX-56438	Provisioning to environments with no discovered or manually added listeners failed.
DLPX-56583	Regex enforcing JDBC strings on upgrade should not be case-sensitive regarding the prefix jdbc:oracle:thin:@.
DLPX-56696	System user can be configured as an LDAP user from system setup.
DLPX-56810	The User screen UI did not have a scroll bar.
DLPX-56813	On a masked VDB configured Clone hooks could not be deleted.
DLPX-56816	Updated Java library for the toolkits to the latest stable version.
DLPX-56870	Updated version of JRE in Windows Connector 1.0.
DLPX-56927	Able to mask VDB from the UI.
DLPX-56928	Masking job selected in Configuration tab of the Provision VDB UI was not applied if submitting from that tab.
DLPX-56991	Setting 'Data Operator' and 'Reader' privileges via UI failed after upgrade to 5.2.2.0.
DLPX-57002	Management service crashed when loading the Dataset Performance screen.
DLPX-57024	Disk expand checkboxes disabled despite expandable space.

### Masking Fixes

Bug Number	Description
DLPX-55768	Add support for special characters in the database schema name.
DLPX-56096	Support special characters in an SFTP connector password.
DLPX-56258	Support large numeric values with the secure shuffle algorithm.
DLPX-56259	Prevent the secure shuffle algorithm from being used with file or mainframe masking jobs.
DLPX-56276	Display a date format input when the date shift algorithm is selected in the Masking Job Wizard.
DLPX-56332	Display a date format input when the min/max algorithm is selected in the Masking Job Wizard.
DLPX-56333	Add support for setting a min/max algorithm's date format in the Masking v5 API.
DLPX-56454	Fix an issue with the secure shuffle algorithm's support for certain Oracle NUMBER datatype sizes.
DLPX-56484	Add support for ' (single quote) characters in a rule set's filter (where clause).
DLPX-56580	The Jackson library is vulnerable to CVE-2017-15095 prior to version 2.9.0.pr3. While Delphix believes the masking engine is not susceptible to this vulnerability, we have upgrading the version of Jackson used to version 2.9.2.
DLPX-56886	Fix an issue that can cause upgrades to fail when the Masking Engine has rule sets with many columns and limited memory.
DLPX-56911	Improve the performance of updating and deleting large rule sets.

### Delphix OS Fixes

Bug Number	Description
DLPX-56697	This fix allows LDAP users to log into the Delphix Engine's command-line interface (CLI) when challenge-response support authentication (CRA) is enabled.

## Release 5.2.2.1 Changes

### Management Server Fixes

Bug Number	Description
DLPX-56437	VDB disable/enable failed post upgrade if mount and umount commands were not in a path on the staging and/or target machine for environment user.

## Known Issues

The following issues are known to exist in this release:

### Release 5.2.5

Key	Summary	Workaround
DLPX-57750	If no network route is defined between the Delphix Engine and target host (using the addresses listed in "NFS Addresses" field of the environment), VDB operations will fail.	
DLPX-58190	After removing the values in the NFS Addresses field for an Environment from the UI or by removing the nfsAddressList attribute of the host via the CLI, may during a VDB enable result in the VDB reporting a false success.	Performing a VDB start should restart the VDB.
DLPX-58900	Provisioning Masked VDBs: As of 5.2.5.0 we have enabled Host Name Verification for Masked Provisioning over SSL/TLS. Any SSL certificates that do not specify the FDQN provided in the masking service config as either the CN or SAN, will fail with an unverified host exception.	Create a new certificate including the correct hostname and upload it.

## Release 5.2.4

N/A

### Release 5.2.3

N/A

### Release 5.2

#### Management Server

Key	Summary	Workaround
DLPX-49081	Adding a duplicate JDBC connection string can cause a management stack error when validating database credentials.	Delete the duplicate JDBC connection string.

DLPX-49514	If an attachsource job fails, in the policy page on the GUI change the policy to another policy (make a temp one if required) then set it back again to the original policy.	<ol style="list-style-type: none"> <li>1. Login to the Delphix Management application.</li> <li>2. Select Manage &gt; Policies.</li> <li>3. Change the policy to another policy (or make a temporary one if required).</li> <li>4. Reset the policy back again to the original policy.</li> </ol>
DLPX-49929	Cancelling a VDB provision or refresh job may leave behind Oracle background processes and cause errors for subsequent jobs for VDBs using the same Oracle SID.	Kill any Oracle background processes on the target system that are using the same Oracle SID.
DLPX-50054	Case mismatch between Oracle database SID and static listener SID list prevents automatic creation of database connection string.	<ol style="list-style-type: none"> <li>1. Manually add connection string, or modify the static listener SID to match case with database SID.</li> <li>2. Refresh the environment.</li> </ol>
DLPX-50633	Hooks and other customer supplied scripts should avoid writing excessive amounts of output, as the output can cause later queries for job information to run out of memory.	None
DLPX-50721	It is not possible to perform VDB migration unless the VDB has at least one snapshot	Take a snapshot of the VDB before migration
DLPX-50864	Oracle standby databases may occasionally shift datafiles into the RECOVER state temporarily during normal operations which will cause provisioning to fail.	Take a new snapshot.
DLPX-51558	Customer scripts should avoid starting operations on the same VDB that the script is running on.	None
DLPX-51648	Provision a VDB to a target host with a bad listener results in successful provisioning, but with wrong online redo log size, if user specifies customized online redo log size for their VDB.	None
DLPX-51779	SSH algorithm "diffie-hellman-group-exchange-sha256" is not currently supported.	None
DLPX-52055	Using SCAN names or IP addresses to discover an Oracle cluster causes discovery to fail with "The host .. is already managed by this Delphix Engine".	Supply a node name or node IP address for cluster discovery.
DLPX-52904	After initial server setup, Default Snapshot/Snapsync policies are always in "US/Pacific", regardless of the timezone selected during initial Engine Setup. An admin has to manually change the time zone.	None
DLPX-53019	Delphix Engine may incorrectly report Oracle redo log files as inaccessible on AIX machines when they are not.	These faults can be programmatically ignored using the ignore fault UI
DLPX-53463	Upgrade does not remove cluster resource dependencies for SQL Server Clustered VDBs and can result in the cluster service going down post-upgrade. This can be worked around by disabling clustered VDBs before the upgrade and enabling them after.	None
DLPX-53688	Refreshing "All Environments" can remove nodes of a Windows failover cluster if individual nodes cannot be refreshed.	Re-run discovery when all nodes are available.
DLPX-53996	The Delphix Engine does not provide instructions to browsers to avoid caching HTTP responses (pages).	None
DLPX-54050	The session cookie (JSESSIONID=<VALUE>) is persistent before and after login.	None



DLPX-54302	For Oracle Grid upgrade scenarios, customers can modify the cluster home location but cannot change the cluster version.	With the management stack shut down, Delphix support personnel can change the cluster version in MDS.
DLPX-54897	Delphix Engine may post no SCAN names found faults when the Delphix OS user's LANG environment variable set to a non-english value.	These faults can be programmatically ignored using the ignore fault UI.
DLPX-55029	Delphix may post faults against Oracle homes that are present in the oracle inventory file but are marked as removed.	These faults can be programmatically ignored using the ignore fault UI
DLPX-55122	LiveSource APPLY RESYNC takes too long to 'dd' datafiles for large dSource	Discard the LiveSource RESYNC. Convert the LiveSource to a dSource, then convert the dSource to a new LiveSource.
DLPX-55459	When performing a CLI or API provision/refresh, the Location parameter must be explicitly set when using TimeflowPointLocation.	In the CLI, either use the defaults command to set initial values when provisioning or refreshing, or explicitly set timeflowPointParameters.location to LATEST_POINT or LATEST_SNAPSHOT.  In API calls, explicitly set timeflowPointParameters.location to LATEST_POINT or LATEST_SNAPSHOT.
DLPX-55651	Delphix periodically (once every 12 hours) checks for sysdba and sysbackup access on all known Oracle homes using a stand-in SID. By default (if audit_sys_operations is true) this will create in entries in the audit file.	None
DLPX-55677	Datafiles backups created by RMAN due to a SnapSync are marked as Unavailable, however the backup of the controlfile is not marked unavailable. Avoid using the Delphix controlfile backups.	Mark the backup of the controlfile taken by Delphix as unavailable:  <pre>RMAN&gt; change backup of controlfile tag '&lt;Delphix tag&gt;' unavailable;</pre> For example:  <pre>change backup of controlfile tag 'DLPX2017111721493689966A19FE27' unavailable;</pre> The 'Delphix tag' can be obtained from the command:  <pre>RMAN&gt; list backup of controlfile summary;</pre>
DLPX-55782	If the toolkit directory for a staging environment is greater than ~43 characters, VDBs will not be able to be provisioned from the snapshots.	Use a shorter toolkit directory path and re-sync'ing the dSource.
DLPX-55814	Replication fails for timeflows with no snapshots	Take a snapshot on the affected VDB and attempt the replication again.
DLPX-55817	When configuring Serviceability from the Setup application, only a single email address may be used for testing SMTP validation. Attempting a comma separated list of email addresses will fail.	None
DLPX-55829	Validated Sync can fail when monitoring ASE backup servers started by using the \$DSSLISTEN environment variable instead of the "-S" argument. This can be worked around by accessing \$DSSLISTEN in the RUN_xxxxx script and pass it down as -S.	Access \$DSSLISTEN in the RUN_xxxxx script and pass it down as -S.

DLPX-55863	Environment discover does not update the version string for manually added ASE instances, which can cause sync failures due to a version mismatch with staging during a sync. This can be worked around by manually updating the version using the CLI.	None
DLPX-55936	Unable to migrate SQL VDB between two Target Clusters from the UI	Use the CLI for migration
DLPX-56081	SQL Server dSource enable fails after a force disable.	Manually drop the staging database using SSMS from the staging SQL Server instance and retrying the enable.
DLPX-56082	SQL Server VDB Refresh after a force disable can fail.	Remove the database from the SQL Server instance using SSMS and re-running the refresh.
DLPX-56271	Provisioning to environments with no discovered or manually added listeners will fail.	<p>If listeners are intended to exist on the Target Environment, start the listener and refresh the environment, or manually add the desired listener.</p> <p>If no listeners should be on the target environment, go to the Environments page and manually edit and append a new placeholder listener.</p>

## Masking

Key	Summary	Workaround
DLPX-48478	The disable constraints feature disables all constraints, not just the ones for masked columns.	None
DLPX-49184	Custom Algorithms that log excessively may cause out of memory errors.	None
DLPX-50028	Users need to purge their browser cache after upgrading the Delphix Masking Engine otherwise, the UI may not render correctly.	Manually clear the cache.
DLPX-50029	Prescripts and postscripts to masking jobs may fail if the script includes a byte-order mark (BOM) character.	On Windows, when using a text editor (like Notepad or Notepad++) Save and use an encoding without BOM (Byte Order Mark). The default encoding ANSI should do that - others are available and more advanced editors enable the exclusion of BOM. This applies to "Save as" as well. This avoids inserting a leading BOM character.
DLPX-50837	Masked provisioning jobs that require more than 240 minutes to execute should be called from a hook script that implements API session re-authentication.	Use a hook script.
DLPX-50877	The "Drop Index" option on a Masking job does not support Oracle composite or functional indices.	None
DLPX-52357	Auto-generated connectors remain after unsuccessful masking job. This is expected behavior and allows failed connections to be inspected. These auto-generated connectors may be deleted after an unsuccessful job.	<p>Delete unwanted connectors through the GUI or the Delphix Masking Engine's V5 REST API (see API process below). The API can be used to automate the deletion.</p> <pre> List all connectors For each connector If the connector's name matches the pattern for an autogenerated connector name delete the connector </pre>

DLPX-52606	Logical key specification, filters or custom SQL statements that include CR (Carriage Return, ASCII 13, \r) LF (Line Feed, ASCII 10, \n) characters may make it impossible to edit a masking rule set.	CR LF characters should not be used in these fields.
DLPX-56222	The secure shuffle algorithm should not be used with on-the-fly (OTF) jobs.	Evaluate using a different algorithm, such as secure lookup, segment mapping, or mapping.

## DelphixOS

Key	Summary	Workaround
DLPX-55614	SQL Server VDB on failover cluster may go into suspect mode during periods of high load.	None