



Database as a Service (DaaS)

Version 1.02

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Database as a Service (DaaS) Overview

CrownPeak offers a Database service for existing users of the Content Management System (CMS) and the Web Hosting environment. This database service operates in the CrownPeak Hosting environment, which is based on Amazon Web Services (AWS). CrownPeak offers several deployment options, which are described in more detail below.

Database as a Service (DaaS) – Benefit

Some of the benefits of the CrownPeak Database service include:

- Standard
 - A managed hosting environment for databases
 - Regular maintenance and updates
 - Monitored seven days a week and 24 hours a day
 - Several database types and versions
 - Highly Available (HA) configuration
- Options
 - Trans-/intercontinental Disaster Recovery (DR)
 - Separate production and non-production environments for increased stability
 - Encryption of data at rest (Provided via CrownPeak Enhanced Data Security Services)

Feature Description

Database Types / Supported Versions

The CrownPeak DaaS is available on two database platforms: Oracle MySQL and Microsoft SQL Server:

- MySQL on Linux (5.6.x)
- MS SQL Server on MS Windows versions (2008 Standard, 2012 Standard, 2014 Standard)

Database Size / Capacity

- 2 vCPU
- 7.5 GB Memory
- Up to 1 TB disk space

Note: Additional disk space can be added as needed. Additional cost may apply.

High Availability (HA)

The CrownPeak DaaS is highly available within a single AWS Region. Data is synchronously mirrored (MS SQL Server) (Always On Availability Groups (AOAG) is not supported; MySQL uses row-based replication, not statement-based. Solutions should be designed accordingly) or replicated (MySQL) between multiple servers.

Disaster Recovery (DR)

Disaster Recovery is an extra level of protection where the CrownPeak DaaS service is deployed in two separate AWS Regions. Data is asynchronously replicated between these two locations.

To take full advantage of this configuration, CrownPeak recommends also deploying web hosting infrastructure in this secondary Region, so that a full application stack is available to continue delivering production service in the event of catastrophic failure in the primary AWS Region. CrownPeak expert architectural services are available to discuss this option in more detail.

Database Server / Databases

Regardless of the platform selected (MS SQL Server or MySQL), customers are free to construct and deploy as many databases as they wish on their CrownPeak DaaS platform. The most common use case for this configuration is the support of multiple non-production software development lifecycle stages (e.g. Development, Quality Assurance, Staging etc.) on a single DaaS deployment.

Database Access and Security

As a managed service, CrownPeak DaaS does not offer end users the ability to connect directly to the platform. Users may not connect data modeling, reporting or development tools directly to the service. Customer developers, database administrators and data architects, however, are free to design any model and any configuration. The design is delivered to CrownPeak in the form of database scripts, which CrownPeak systems administrators will run on customers' behalf. Any log files produced by such scripts are delivered back to the customer.

The CrownPeak DaaS is based on a production level support model and provides only the necessary levels of access required by the web servers and the privileged users that are required to add, update, or delete data in the database. The following are the standard access levels:

- **Administrative Level Access** – This is limited to CrownPeak IT Operations staff. All Data Definition Language (DDL) SQL requests must be scripted and submitted via the standard CrownPeak support process
- **User Level Access** – Customer solution designers may wish to create restricted-permissions, user-level service accounts to be used by application server connection pools etc. These user accounts may be created via the scripting process, as described above.
- **Data Import Access** – Bulk data may be loaded into the database using an import script submitted as a CrownPeak support request
- **Data Export Access** – Data can be extracted from the database using an export script submitted as a CrownPeak support request

Production and Non-Production Environments (Separation of Environments)

CrownPeak offers production database servers in a managed hosting environment. A production environment requires a specific set of hardware, infrastructure and change control procedures to ensure a high level of stability. A single DaaS deployment provides a highly available database platform deployed in a single AWS Region. While this is a highly cost-efficient model for delivery of persistent data services, it carries the risk that instability in the development stages may compromise the platform and impair production service. To mitigate this risk, CrownPeak recommends that CrownPeak DaaS services be deployed as pairs, one DaaS platform supporting production operations and one platform supporting all other development lifecycle stages. This approach ensures that production service delivery is insulated from any instability that may be introduced through the normal course of development, QA and load testing operations.

Maintenance and Support Updates

The CrownPeak database service includes regular maintenance and support updates such as the installation of service packs, security updates and other recommended vendor updates. These updates are applied at the request of customer and during a pre-arranged CrownPeak maintenance window. CrownPeak assumes that these updates have been previously tested by the customer in a non-production environment and that the customer is satisfied that the update will have no negative impact on the CrownPeak production environment. CrownPeak will not be responsible for any outage arising from the application of a security patch or any other form of vendor-supplied update, provided that the update has been properly applied in accordance with the vendor's instructions. However, CrownPeak will provide prompt recovery and rollback services if necessary to reverse the negative impact of any applied update.

CrownPeak also performs routine optimization, such as index rebuild, object consistency check and table defragmentation as part of its normal operational maintenance regimen.

Note: CrownPeak will not provide an opinion on security patches released by Microsoft or MySQL or provide an independent data vulnerability assessment.

Database Backups and Recovery

CrownPeak DaaS performs automatic database backups on a regular basis. Customers should submit a support request via the normal CrownPeak customer service process to request restoration or recovery services. The following are the standard database backup and recovery features:

- Full backups - Daily
- Transaction log backups - Every fifteen (15) minutes
- Return to Operation (RTO) - Backups can be recovered and applied within six (6) hours of the request
- Recovery Point Objective (RPO) - Maximum data loss is limited to thirty (30) minutes.
- Backup Retention - Backups are retained for ninety (90) days. (Longer retention periods are available via CrownPeak's Long Term Archival Storage option)

Note: Additional backup schedules and retention options can be added as needed. Additional costs may apply.

Monitoring Support

The CrownPeak DaaS is monitored 7 days a week and 24 hours a day by a set of tools that will alert the Database service team. DaaS is monitored and logged at several levels including:

Platform - CPU percentage, network traffic, disk reads, disk writes

Disk Storage - Current size, growth rates, large changes in size up or down

Database Service - Level of activity based on SQL queries

Note: CrownPeak maintains comprehensive performance monitoring for internal purposes. Generally, these statistics are not shared with customers. However, on a case-by-case basis, CrownPeak may share performance statistics in the course of troubleshooting or diagnosing a particular issue.

Capacity Planning and Storage Management

CrownPeak monitoring continuously tracks the size and growth of each customer's DaaS. The internal CrownPeak database service team is alerted when the database size or activity level reaches predetermined thresholds. With respect to disk capacity, disk storage is transparently allocated as necessary up to the limit of 1 TB (1,099,511,627,776 bytes).

Note: Additional disk capacity can be provided as needed. Additional cost may apply.

Backups and Data Extracts from the Database

CrownPeak DaaS is provided under the terms and conditions of the master subscription agreement in place between the customer and CrownPeak. Accordingly, at the conclusion of the subscription, CrownPeak will provide a copy of all database data to the customer in a mutually agreeable format.

During the lifetime of the subscription, backups are maintained for CrownPeak internal purposes only. However, periodic extracts may be requested as part of a Professional Services engagement.

Frequently Asked Questions (FAQ)

Question: Are separate environments available for production and non-production?

Answer: Yes, if these options are specified in your contract.

Question: Are regular update and service packs update part of the database service.

Answer: Yes, please see the Maintenance and Support Updates section above for details.

Question: Are High Availability (HA) and Disaster Recovery (DR) options available.

Answer: Yes, please see the High Availability (HA) and Disaster Recovery (DR) section above for details.

Question: How are database design changes made?

Answer: All Data Definition Language (DDL) SQL requests must be scripted and submitted as a CrownPeak support request.

Question: How is data added and removed from the database?

Answer: Apart from the normal course of data update supported by the customer's business application, data can be inserted into the database via an import script submitted as a CrownPeak support request. Similarly, data can be extracted and/or deleted from the database via a script submitted as a CrownPeak support request.

Question: During the development phase, could CrownPeak provide sufficient access to the database to allow users to connect with an administration tool such as MS SQL Server Management Studio?

Answer: No. For customers requiring this level of access during development, CrownPeak recommends that a separate environment be deployed locally to the developer. CrownPeak provides technical specifications and Amazon Machine Images to assist developers in provisioning environments that match those provided by CrownPeak DaaS.

Database as a Service (DaaS) Terminology

Below is a list of common terms associated with Database as a Service (DaaS).

Term	Definition
AWS	Amazon Web Services. (CrownPeak is an AWS Advanced Technology Partner.)
CMS	The CrownPeak Content Management System (CMS)
DaaS	Database as a Service
DDL	Data Definition Language. Commands implemented in SQL, which create, update or delete database objects, such as tables, users and views. DDL is most commonly used to create or update a schema used by a business application.
Disaster Recovery	Redundant hardware and services in a secondary location and uses as a failure option when the primary location is unavailable.
DML	Data Manipulation Language. Commands implemented in SQL, which create, update, delete and retrieve data from a database. DML is most commonly used by a business application in the normal course of its operation.
High Availability	Redundant hardware and services in one location to prevent a single point of failure
RDBMS	Relational Database Management System. A database management system based on the industry-standard "relational model", which represents data as tables, consisting of rows and columns and which are inter-related via the use of "keys".
SaaS	Software as a Service
SQL	Structured Query Language. A special-purpose programming language designed for managing data held in a relational database management system (RDBMS).

Notes and Additional Information

More information can be found on Connect.

CrownPeak Database as a Service (DaaS): www.connect.crownpeak.com/