Valkeyの概要

概要

Valkeyは、データベース、キャッシュ、メッセージブローカ、ストリーミングエンジンとして優れた機能を備えたオープンソースのインメモリデータ構造ストアです。Valkeyは、アプリケーションの高速化と、強化されたマルチスレッドと信頼性による多様なデータニーズの効率的な管理に不可欠な、高性能でスケーラブルかつ多用途なインメモリデータストアを提供します。

目的

Valkeyのインストールと設定方法を習得します。

所要時間

理解に40分ほどを要します。

目標

SUSE Linux Enterprise ServerへのValkeyの設定、またはRedisからValkeyへの移行。

発行日: 01/10/2026

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1 Valkeyについて

ValkeyはRedisバージョン7.2.4のフォークです。Valkeyは、BSD (Berkeley Software Distribution)ライセンスに基づいてライセンスされたオープンソースのインメモリデータ構造ストアであり、さまざまなアプリケーション用の多用途プラットフォームとして機能します。高速で柔軟なデータ ストレージを提供するデータベースとして、アプリケーションパフォーマンスを大幅に向上させキャッシュとして、非同期通信を可能にするメッセージブローカとして、さらにリアルタイムデータ処理のためのストリーミングエンジンとしても優れています。ValkeyはRedis OSSの基盤の上に構築され、パフォーマンスを向上させるマルチスレッドを組み込んでおり、速度、スケーラビリティ、多様なデータ処理機能を要求するアプリケーション向けに堅牢なソリューションを提供します。

Valkeyには、次のような多くの利点があります。

- メモリに保存されたデータへの高速で低遅延なアクセスを提供し、キャッシュ、リアルタイム分析、メッセージブローカリングに最適です。
- 文字列、ハッシュ、リスト、セット、ソートされたセット、ストリーム、地理空間インデックスなどの強力で多用途なデータ構造をサポートします。
- 再起動後のデータの回復のために、RDB (Redis Database Backup)スナップショットとAOF(追加専用ファイル)の永続性を提供します。
- 複数のノードにデータを分割することにより、水平スケーリングを可能にします。
- Redis 7.2との互換性が維持されているため、既存のクライアントライブラリやアプリケーションロジックを変更せずに簡単に移行できます。
- イベント駆動型またはメッセージングベースのシステムを構築するための組み込みのパブリッシュ/サブスクライブ機能を提供します。

Valkeyの詳細については、https://valkey.io/docs/を参照してください。

2 Valkeyの管理

Valkeyをインストールし、コマンドラインツールを使用し、RedisからValkeyに移行する方法を習得します。

2.1 Valkeyサービスファイルの設定

Valkeyは、データベース、キャッシュ、メッセージブローカ、ストリーミングエンジンとして機能するオープンソースのインメモリデータストアです。

手順 1: VALKEY systemdサービスファイルの作成

1. Valkeyをインストールします。

```
> sudo  zypper -n in valkey
```

2. Valkey systemdサービスファイルを作成します。

```
> sudo  vi /etc/systemd/system/valkey.service
```

3. ファイルに次の指定を追加します。

```
[Unit]
        Description=Valkey In-Memory Data Store
        After=network.target

        [Service]
        User=valkey
        Group=valkey
        ExecStart=/usr/sbin/redis-server /etc/redis/valkey.conf
        LimitNOFILE=10240
        ExecStop=/usr/bin/valkey-cli shutdown
        Restart=always

        [Install]
        WantedBy=multi-user.target
```

4. サンプルファイルを指定された設定ファイルにコピーします。

```
> sudo  cp /etc/valkey/default.conf.example /etc/valkey/valkey.conf
```

5. ファイルアクセス権を更新します。

```
> sudo  chown valkey:valkey /etc/valkey/valkey.conf
```

6. Valkeyサービスを開始して有効にします。

```
> sudo  systemctl start valkey
```

```
> sudo  systemctl enable valkey
```

7. Valkeyのセットアップを確認します。

```
valkey-cli ping
```

このコマンドに対して `PONG` と表示されたら、Valkeyがシステム上で実行されています。

2.2 Valkeyコマンドラインインタフェース

Valkeyコマンドラインインタフェースは、Valkeyの管理、デバッグ、およびテストに使用されます。デフォルトでは、**`valkey-cli`**コマンドはアドレス`127.0.0.1`、ポート`6379`のサーバに接続します。

`valkey-cli`コマンドオプションには次のものが含まれます。

`-h`
: デフォルトのIPが127.0.0.1であるサーバホスト名。

`-p`
: デフォルト値が6379のサーバポート。

`-t`
: サーバ接続のタイムアウト(秒単位、小数点も使用可能)。デフォルトのタイムアウトは`0`で、無制限を意味し、オペレーティング システムによって異なります。

`-s`
: サーバソケットはホスト名とポートを上書きします。

`-a`
: サーバに接続するときに使用するパスワード。`VALKEYCLI_AUTH`環境変数を使用して、このパスワードをより安全に渡すこともできます。両方のオプションが使用される場合、この引数が優先されます。

`--user`
: ACL(アクセス制御リスト)スタイルを送信するために使用されるユーザ名。 `AUTH username pass`です。`-a`オプションが必要です。

`--pass`
: 新しい`--user`オプションに合わせるため、 `-a`オプションのエイリアスとなるパスワード。

`--askpass`
: マスク付きのSTDIN経由のパスワード入力を強制します。この引数が使用されると、`-a`および`VALKEYCLI_AUTH`環境変数は無視されます。

`-u`
: `valkey://user:password@host:port/dbnum`形式のサーバURI。ユーザ、パスワード、dbnumはオプションです。ユーザ名なしの認証の場合は、ユーザ名`default`を使用します。TLSの場合は、スキーム`valkeys`を使用します 。

`--help`
: ヘルプを出力して終了します。

`--version`
: バージョンを出力して終了します。

`--cluster help`
: 利用可能なすべてのクラスタマネージャコマンドを一覧表示します。

例 1: 基本的な`valkey-cli`コマンド例:

- `SET`:キーと値のペアを設定します。

  ```
  > valkey-cli SET KEY_NAME "Hello Valkey"
  ```

  次に例を示します。

  ```
  > valkey-cli SET TESTKEY "Hello Valkey"
  ```

- `GET`:キーに関連付けられた値を取得します。

  ```
  > valkey-cli GET TESTKEY
    "Hello Valkey"
  ```

- `DEL`:キーを削除します。

  ```
  > valkey-cli DEL TESTKEY
    (integer) 1
  ```

  削除された場合は`1`、見つからない場合は`0`。

- `INFO`:Valkeyサーバに関する情報と統計情報を表示します。

  ```
  > valkey-cli INFO
    Server
  ```

```
  redis_version:7.2.4
  server_name:valkey
  valkey_version:8.0.2
  redis_git_sha1:00000000
  redis_git_dirty:0
  redis_build_id:e0cc1d08b1f9571a
  server_mode:standalone
  os:Linux 6.12.0-160000.9-default x86_64
  arch_bits:64
  monotonic_clock:POSIX clock_gettime
  multiplexing_api:epoll
  gcc_version:13.3.1
  process_id:974
  process_supervised:no
  run_id:32864c141804bcb17cae98145beee86ca251afd7
  tcp_port:6379
  server_time_usec:1750760734442451
  uptime_in_seconds:2780
  uptime_in_days:0
  hz:10
  configured_hz:10
  lru_clock:5930270
  executable:/usr/sbin/redis-server
  config_file:/etc/valkey/valkey.conf
  io_threads_active:0
  availability_zone:

[...]
```

- MONITOR:Valkeyサーバによって処理されたすべてのコマンドをリアルタイムでストリーミングします。

```
> valkey-cli MONITOR
OK
```

- KEYS:パターンに一致するすべてのキーを検索します。

```
> valkey-cli KEYS "*" # All keys
"TESTKEY"
"TESTKEY1"
```

2.3 RedisからValkeyへの移行

Valkeyは、Redis API、プロトコル、永続データ、ポート、設定ファイルとの互換性を維持しながら、シームレスな代替となるように設計されています。多くの基本的な設定では、RedisからValkey への移行は簡単です。次の手順では、Redisがインストールされ、実行されており、データがロードされていることを前提としています。

手順 2: REDISからVALKEYへの移行方法

1. 現在のRedisサーバのバージョンを確認します。

```
> redis-cli info server
        # Server
        redis_version:7.2.4
        redis_git_sha1:00000000
        redis_git_dirty:0
        redis_build_id:8c22b097984bd350
        redis_mode:standalone
        [...]
```

2. `--force-resolution`オプションを指定して`valkey-compat-redis`パッケージをインストールします。

```
> sudo  # zypper in --force-resolution valkey-compat-redis
        Refreshing service 'NVIDIA'.
        Refreshing service 'openSUSE'.
        Loading repository data...
        Reading installed packages...
        Resolving package dependencies...

        The following 2 NEW packages are going to be installed:
          valkey valkey-compat-redis

        The following package is going to be REMOVED:
          redis

        2 new packages to install, 1 to remove.

        Package download size:     1.3 MiB

        Package install size change:
                      |       5.2 MiB  required by packages that will be installed
          -245.2 KiB  |  -    5.4 MiB  released by packages that will be removed

        Backend:  classic_rpmtrans
        Continue? [y/n/p/...? shows all options] (y):
```

このパッケージは、既存の設定ファイルと永続データを取得し、追加の手順を必要とせずにValkeyに移行します。この移行は、ValkeyがRedis API、プロトコル、永続データ、ポート、設定ファイルと完全に互換性があるために可能になります。

3. Valkeyを起動して有効にします。

```
> sudo  systemctl start valkey
```

```
> sudo  systemctl enable valkey
```

4. サーバ情報を確認します。

```
> redis-cli info server
            # Server
            redis_version:7.2.4
            server_name:valkey
            valkey_version:7.2.5
            redis_git_sha1:00000000
            redis_git_dirty:0
            redis_build_id:b0d9f188ef999bd3
            redis_mode:standalone
            [...]
```

Valkeyは`redis_version:7.2.4`と`valkey_version:7.2.5`の両方に対応しています。`redis_version`を保持することで、`valkey_version`でサーバを識別しながら、最大限の互換性を確保できます。Valkeyには、`valkey-cli` というバイナリがありますが、シンボリックリンクで`redis-cli`を参照しています。どちらのCLIも同じ機能を備えています。

3 法的事項

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