VMware Tanzu

GemFire

Updated: 2020

Why Tanzu GemFire?

10x-100x faster than a DB

Tanzu GemFire is the BEST way to store the state for your 12 factor apps on Tanzu Platform

Tanzu GemFire

Your app remains stateless
- but gives the appearance of a rich, stateful app. State is stored in a highly resilient, distributed in-memory cache

Cache and App are independently scalable as needed
- App will scale utilizing mainly CPU as more concurrent users hit it
- Cache will consume more memory as you dynamically scale

Transparently cache your HTTP session state
- Session follows user connection even if it moves to a different server or foundation

Store your application data
- App data is available at memory speeds anywhere the app runs with reliability due disk persistence

What is VMware GemFire, Geode and Tanzu GemFire?

"Every modern application needs a Cache"

VMware Tanzu GemFire

VMware GemFire ▭▭ APACHE GEODE

Apache Geode and **VMware GemFire** are the same codebase.

VMware Tanzu GemFire expands on the **Apache Geode** codebase by providing enterprise ready features including:

➔ OOTB Security implementation
➔ Day 2 operations automation
➔ Easy logging and metrics
➔ Easy Upgrades
➔ Easy installations

Enabling developers to create on demand instances automatically.

- In addition to the large number of Java and Spring applications using Tanzu GemFire, we are increasing our efforts towards additional workloads.
  - .NET Framework and C++ client library are already available
  - Fully tested client side library enabling NodeJS clients.
- Partitioned regions "Get" is now 4x times faster and "Put" is now 2x times faster
- New Management REST API to consistently change your cluster configurations

VMware Tanzu GemFire

Tanzu GemFire

Any k8s

- Tanzu GemFire processes would be running on k8s Containers

- Can be installed on any k8s(Azure, Google, VMware)

- Option to have OOTB integrations
  - Tanzu Application Service for `cf push` experience
  - Tanzu Mission Control for easy management

Why Redis APIs?

Companies need Enterprise level features when it comes to data stores

- Security - AuthZ, AuthC, Encryption in motion
- Disaster recovery - Backup restore, Availability Zones, Cross Geo replications
- Ease of use for developers e.g. Spring integrations, easy to understand APIs
- Easy Day 2 operations
- Multiple Language support
- Performance - Query/Indexes, Multi core utilizations
- Optimum resource utilizations - CPU and memory

Tanzu GemFire can do this today !

Why Redis APIs?

We compared Redis with Enterprise requirements

Pros

- Easy to understand and get started.
- Many open source libraries and utilities that support Redis APIs
- Easy to move existing Redis applications
- Supports multiple languages

Cons

- No client side caching. This can be a huge performance boost for application when needed
- Master slave configuration only. With Cloud environment where repaving is common this can lead to potential issues
- Availability over consistency
- Lack of Security features OOTB

What are we building?

Our approach to enabling Redis APIs on Tanzu GemFire
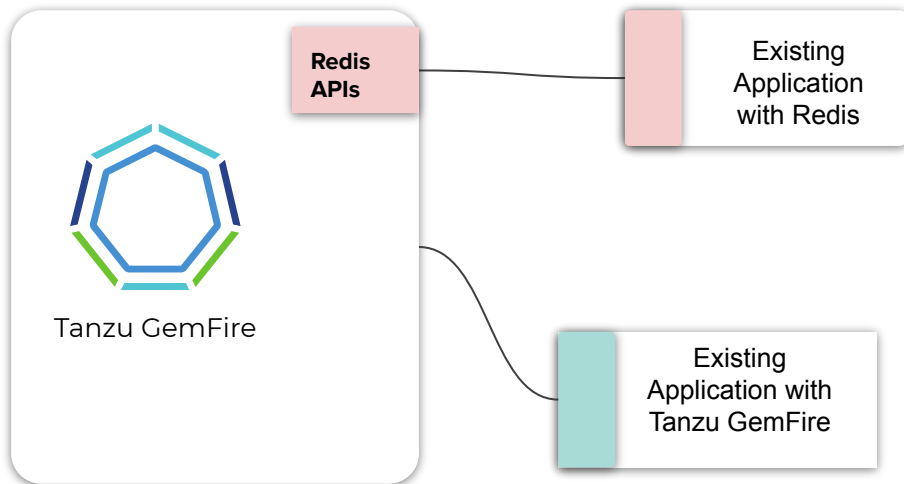
Iterating towards a full set of Redis API commands backed by Tanzu GemFire

- Starting with Spring Session Data Redis
- No code change migration to Tanzu GemFire.
- Operators can enable Redis APIs
- Dedicated port for Redis applications
- Provide enterprise features such as
  - HA (High Availability)
  - Security built in. Authentication and authorization
  - Cross data center replication
  - Favor Consistency - You always get the right data !
  - Encryption in Motion
- Can support Redis CLI and other open source Redis tools
- First release targeted for June

Kafka connector for Tanzu GemFire

Tanzu GemFire

Sink → Tanzu GemFire → Source
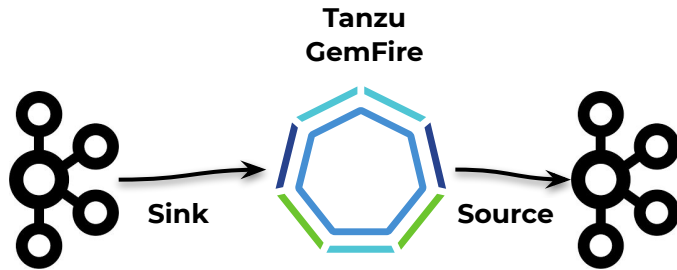
- Officially supported connector for Tanzu GemFire with Apache Kafka
- Connector enables Tanzu GemFire to be configured as Source or Sink for Apache Kafka
- Get the data Consistency mission critical applications need from Tanzu GemFire with data pipelines built with Apache Kafka
- Enables Change Data Capture over Kafka

Secure By Default
Data security has to be baked in to everything we do

- oAuth2 protocol support with Auth Grant flow
  - No password required to login

- Encryption of data on disk

Tanzu GemFire as the Caching layer for Spring Boot applications

- Improved/simplified APIs
  - Spring Boot Library seamlessly enables Spring Apps to use Tanzu GemFire
  - Server side regions and other commands are able to be created directly from Spring based client code
- Focused user guides and examples
  - More Spring Boot examples introducing common use cases
- CI/CD for Application Code
  - Best practices around Tanzu GemFire application testing
  - Simplifying debugging with clear metrics and tracing
  - Spring Test project to quickly test applications with Tanzu GemFire
- Provider better memory management with G1 GC and JDK 11 support

Operator Experience

- Convention over configuration
  - Preconfigured with sensible defaults
  - Configuration options are exposed based on customer needs
- Improve management tools
  - All new Management REST API to enable new tools
  - Platform CLI Plug-in

- Better observability
  - Three main aspects:
    - Metrics/Stats
    - Logging
    - Tracing
  - Investing in Spring Micrometer
  - Integrate with VMware Tanzu Healthwatch or Wavefront
  - Look toward observing a "Fleet of clusters"

Cloud First Approach
Easy to deploy, easy to scale, always on

Cloud First

- Self service deployment model
  - Declarative configuration for the cluster
  - With configuration as code support (Spring)
  - Public APIs to support other languages and tools
  - CF command-line plugin
- Highly Resilient
  - Leverage all the work being done by the platform in this area
- Minimal Downtime
  - We are working hard at making upgrades and configuration changes work with rolling restarts
- Easy Horizontal Scaling
  - Cloud gives us this ability to imagine we have lot of resources, which means we should invest into how to make the scaling of the product as easy as possible

Tanzu portfolio is the Best place to run your .NET workloads

.NET Core

- Microsoft is investing heavily in .NET Core

- .NET Core applications running on Platform will soon be able to leverage VMware Tanzu GemFire as a Caching layer

- Steeltoe integration will soon follow

Thank You