



Snap Creator architecture

Snap Creator Framework

NetApp
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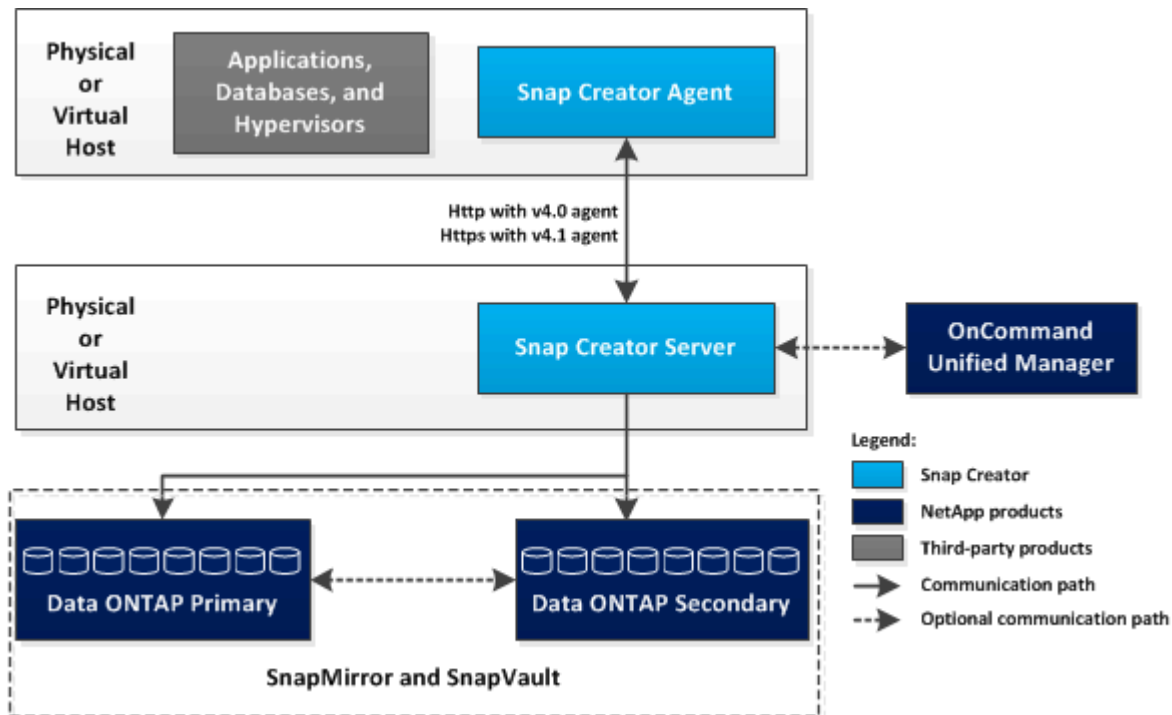
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Snap Creator architecture

Snap Creator has a full-featured server and agent architecture, which consists of three main components: Snap Creator Server, Snap Creator Agent, and plug-ins.

Snap Creator interacts and integrates with various technologies and products as depicted in the following high-level diagram:



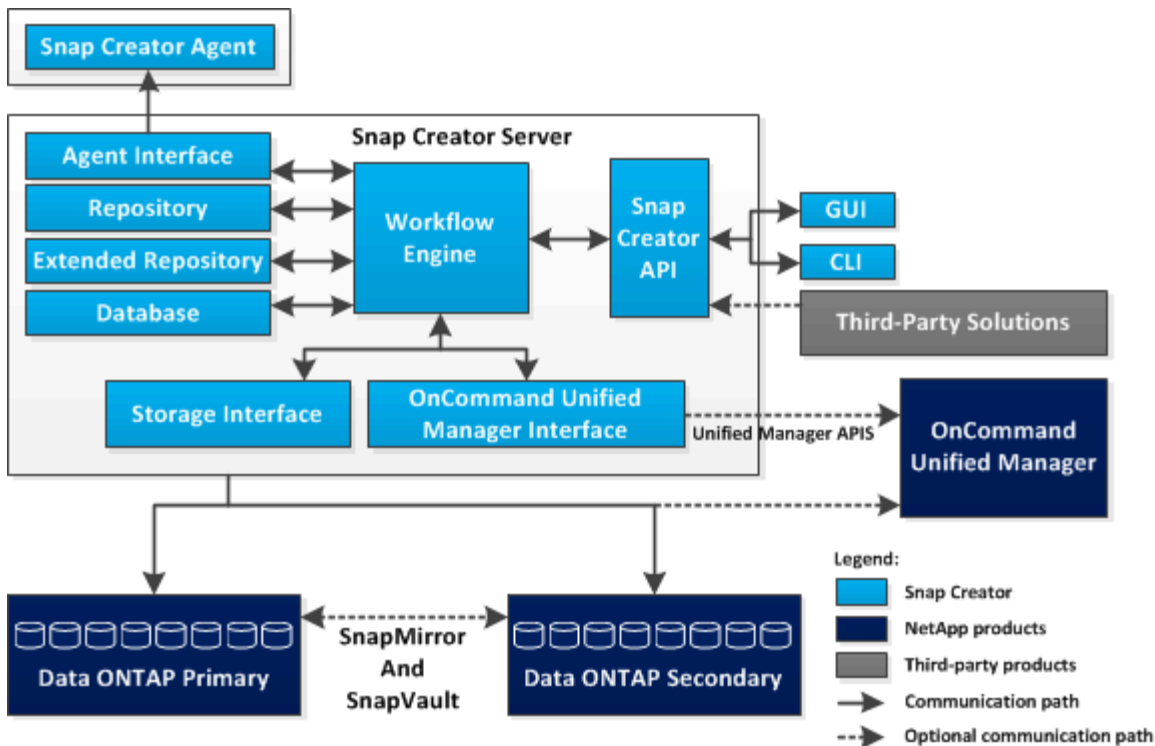
The NetApp software products in the high-level diagram are optional; except for Snapshot technology, the other software products are not required for the Snap Creator Framework to function.

Snap Creator Server overview

The Snap Creator Server is the main engine of the Snap Creator Framework.

Typically, the Snap Creator Server is installed on a physical or virtual host. The server hosts the Snap Creator graphical user interface (GUI) and the databases required for storing information about jobs, schedules, users, roles, profiles, and configuration files, as well as metadata from plug-ins. The Snap Creator Server is sometimes shortened to scServer within Snap Creator.

The following illustration depicts the architecture for the Snap Creator Server:



The Snap Creator Server component, which is written in Java, is typically installed on a central backup server. In smaller environments, this component can be installed on the host on which the application or database that you want to manage is installed. The Snap Creator Server component includes the following parts:

- **Workflow engine**

Runs all the Snap Creator tasks and commands. The XML-driven, multi-threaded workflow engine is the central component of Snap Creator.

- **Snap Creator Application Programming Interfaces (APIs)**

Used by the Snap Creator GUI and command-line interface (CLI).

- **Snap Creator repository**

Contains information about Snap Creator profiles and configuration files, including global configurations and profile-level global configurations.

- **Snap Creator extended repository**

Provides a database location for every job that is run in Snap Creator, including important information about the job as well as metadata generated by plug-ins.

- **Snap Creator database**

Stores information about Snap Creator schedules and jobs as well as role-based access control (RBAC) users and roles.

- **Storage Interface**

Serves as a common Snap Creator interface for NetApp storage systems, which uses Data ONTAP APIs to handle operations such as creating Snapshot copies, SnapVault updates, and SnapMirror updates.

- **Active IQ Unified Manager Interface**

For optional communication with NetAppActive IQ Unified Manager, this interface uses Unified Manager APIs instead of Data ONTAP APIs for operations such as creating Snapshot copies, SnapVault updates, and SnapMirror updates.

- **Agent Interface**

Communicates with Snap Creator agents. Although the Snap Creator Agent and Snap Creator Server are usually installed on different physical or virtual hosts, both can be installed on the same host.



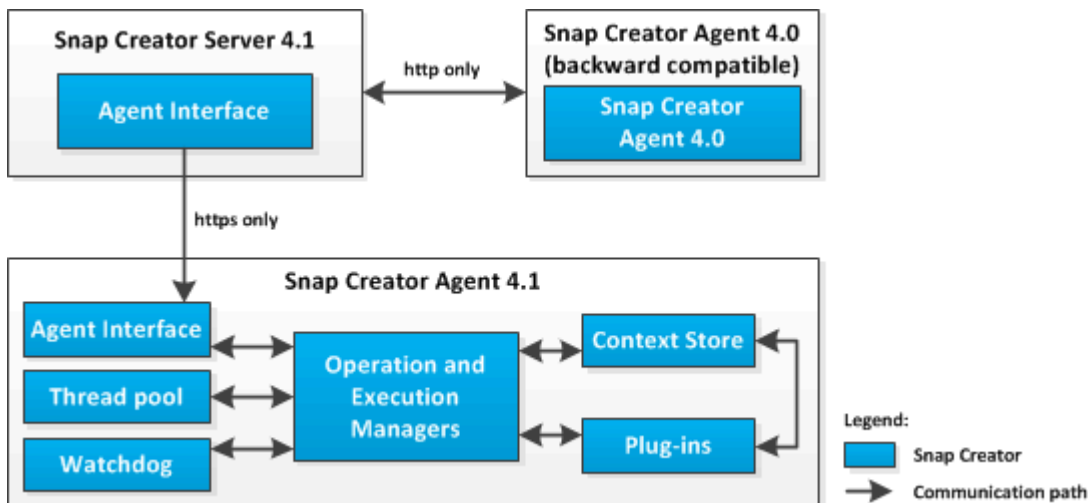
Snap Creator Server 4.3.0 supports only Snap Creator Agent 4.1.x and 4.3.x. Snap Creator Server 4.3.0 does not support Snap Creator Agent versions before 4.1.x.

Snap Creator Agent overview

The Snap Creator Agent, typically installed on the same host where an application or database is installed, handles quiesce and unquiesce commands from the Snap Creator Server to a given application, and is where the plug-ins are located. Agent is sometimes shortened to scAgent within Snap Creator.

The Snap Creator Agent receives communication from the Snap Creator Server's Agent Interface through the Agent RESTful interface, and through HTTPS only. This means secure and encrypted communication, which is a very important feature in multi-tenant and cloud environments. Self-signed certificates allow the use of a generated certificate with the Snap Creator Agent. Furthermore, the Snap Creator Agent is protected by a configurable user and password combination, which is stored on disk.

The following illustration depicts the architecture of the Snap Creator Agent:



The Snap Creator Agent (sometimes shortened to scAgent within Snap Creator itself) component includes the following parts:

- **Operation and Execution Managers**

The Operation Manager takes care of the incoming, outgoing, and completed requests. The Execution Manager is responsible for executing the requests.

- **Thread pool**

Consisting of worker threads, the thread pool is used to execute multiple tasks.

This determines the number of concurrent operations at any given time. The Execution Manager executes a plug-in, and it executes it in one of the threads in the thread pool. If the thread pool has eight threads, you can run eight plug-in operations concurrently. New incoming operations are queued, until threads become free again.

- **Watchdog**

Triggered by the Execution Manager for certain operations, typically quiesce, the Watchdog calls back to the Execution Manager after a specified time to stop the operation, if necessary, and executes a corresponding undo operation. For example, the Plug-in quiesce function is called to put the application into a backup mode. The Watchdog starts listening. If the unquiesce is not executed within the specified time window, the Watchdog unquiesces the application, putting it back into normal operation mode. This is to ensure that the database does not get stuck in backup mode.

- **Context Store**

Holding all information needed for the lifetime of the workflow, the Context Store provides context objects to the plug-in as needed, and, if a workflow fails or is never completed, the context object is deleted after a period of time.

For workflows that do not finish or that fail in an undefined state, there is a maximum context time specified in `install_path/etc/agent.properties`: `CONTEXT_LIFETIME_IN_MSEC=1800000` (the default value, 30 minutes). If this value is increased, the Snap Creator Agent occupies more memory.

- **Plug-in Factory**

The Plug-in Factory starts the plug-in and ensures that it runs in an isolated space. The Plug-in Factory also communicates with the Context Store to access stored information. It also enables running Perl-based and native plug-ins from Snap Creator using the Plug-in Integration Engine.

The Snap Creator Agent can also use plug-ins written in languages other than Java.

Plug-ins for application integration

Plug-ins are used to put applications or databases into a consistent state. Snap Creator contains several plug-ins that are part of the binary file and do not require any additional installation.

The types of applications that are supported include database, email, hypervisor, and custom applications. The following plug-ins are supported for use with Snap Creator:

- Application and database plug-ins:
 - DB2
 - IBM Domino (Domino)
 - MaxDB
 - MySQL



The MySQL plug-in does not support backup and restore operations for multiple databases.

- Oracle
- SAP High-Performance Analytic Appliance (HANA)
- Sybase Adaptive Server Enterprise (ASE)
- SnapManager plug-ins:
 - SnapManager for Microsoft Exchange
 - SnapManager for Microsoft SQL Server
- Hypervisor plug-ins:
 - Citrix XenServer
 - Red Hat Kernel-based Virtual Machine (KVM)
 - VMware (vSphere for individual virtual machine backup and vCloud Director for vApp backup)

For more information, see the plug-in information required to configure Snap Creator. Custom plug-ins (also called "community plug-ins") are created by the developer community, and can be enabled by Snap Creator; however, custom plug-ins are not supported. These plug-ins leverage the interface provided by Snap Creator.

For more information, see [Snap Creator Framework Discussions Community forum](#).

Related information

[Plug-in information required to configure Snap Creator](#)

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