.NET Aspire setup and tooling

Article • 05/21/2024

.NET Aspire includes tooling to help you create and configure cloud-native apps. The tooling includes useful starter project templates and other features to streamline getting started with .NET Aspire for Visual Studio, Visual Studio Code, and CLI workflows. In the sections ahead, you'll learn how to work with .NET Aspire tooling and explore the following tasks:

- ✓ Install .NET Aspire and its dependencies
- ✓ Create starter project templates using Visual Studio, Visual Studio Code, or the .NET CLI
- ✓ Install .NET Aspire components
- ✓ Work with the .NET Aspire dashboard

Install .NET Aspire

To work with .NET Aspire, you'll need the following installed locally:

- .NET 8.0.
- .NET Aspire workload (installed either Visual Studio or the .NET CLI).
- An OCI compliant container runtime, such as:
  - Docker Desktop or Podman. For more information, see Container runtime.
- An Integrated Developer Environment (IDE) or code editor, such as:
  - Visual Studio 2022 version 17.10 or higher (Optional)
  - Visual Studio Code (Optional)
    - C# Dev Kit: Extension (Optional)

The .NET Aspire workload installs internal dependencies and makes available other tooling, such as project templates and Visual Studio features. There are two ways to install the .NET Aspire workload. If you prefer to use Visual Studio Code, follow the .NET CLI instructions:

To ensure that you install the latest version of the .NET Aspire workload, run the following dotnet workload update command before you install .NET Aspire:

.NET CLI

```
dotnet workload update
```

To install the .NET Aspire workload from the .NET CLI, use the dotnet workload install command:

.NET CLI

```
dotnet workload install aspire
```

To check your version of .NET Aspire, run this command:

.NET CLI

```
dotnet workload list
```

Container runtime

.NET Aspire projects are designed to run in containers. You can use either Docker Desktop or Podman as your container runtime. Docker Desktop is the most common container runtime. Podman is an open-source daemonless alternative to Docker, that can build and run Open Container Initiative (OCI) containers. If your host environment has both Docker and Podman installed, .NET Aspire defaults to using Docker. You can instruct .NET Aspire to use Podman instead, by setting the `DOTNET_ASPIRE_CONTAINER_RUNTIME` environment variable to `podman`:

Linux

Bash

```
export DOTNET_ASPIRE_CONTAINER_RUNTIME=podman
```

For more information, see Install Podman on Linux.

.NET Aspire project templates

The .NET Aspire workload makes available .NET Aspire project templates. These project templates allow you to create new apps pre-configured with the .NET Aspire project structure and default settings. These projects also provide a unified debugging experience across the different resources of your app.

There are currently four project templates available:

- **.NET Aspire project**: A minimal .NET Aspire project that includes the following:
  - **AspireSample.AppHost**: An orchestrator project designed to connect and configure the different projects and services of your app.
  - **AspireSample.ServiceDefaults**: A .NET Aspire shared project to manage configurations that are reused across the projects in your solution related to resilience, service discovery, and telemetry.
- **.NET Aspire Starter Application**: In addition to the **.AppHost** and **.ServiceDefaults** projects, the .NET Aspire Starter Application also includes the following:
  - **AspireSample.ApiService**: An ASP.NET Core Minimal API project is used to provide data to the frontend. This project depends on the shared **AspireSample.ServiceDefaults** project.
  - **AspireSample.Web**: An ASP.NET Core Blazor App project with default .NET Aspire service configurations, this project depends on the **AspireSample.ServiceDefaults** project.
- **.NET Aspire App Host**: A standalone **.AppHost** project that can be used to orchestrate and manage the different projects and services of your app.
- **.NET Aspire Test Project (xUnit)**: A project that contains xUnit.net integration of a .NET Aspire AppHost project.
- **.NET Aspire Service Defaults**: A standalone **.ServiceDefaults** project that can be used to manage configurations that are reused across the projects in your solution related to resilience, service discovery, and telemetry.

  > **Important**
  >
  > The service defaults project template takes a `FrameworkReference` dependency on `Microsoft.AspNetCore.App`. This may not be ideal for some project types. For more information, see .NET Aspire service defaults.

Use Visual Studio, Visual Studio Code, or the .NET CLI to create new apps using these project templates. Explore additional .NET Aspire project templates in the .NET Aspire samples repository.

> **Note**

The .NET 9.0 SDK causes issues with the .NET Aspire workloads ability to display templates, and create projects from the templates. If you're using .NET 9.0, know that your ability to create new .NET Aspire apps is currently limited. For more information, see .NET Aspire preview-3 cannot create app when .NET 9 is installed and .NET Aspire preview-3 installed with Visual Studio 17.10 doesn't show templates.

To see which .NET Aspire project templates are available, use the dotnet new list command, passing in the search term `aspire`:

.NET CLI

```
dotnet new list aspire
```

When the .NET Aspire workload is installed, you'll see the following .NET Aspire templates:

Output

```
These templates matched your input: 'aspire'

Template Name                      Short Name              Language
Tags
---------------------------------  ----------------------  --------  -
-------------------------------------------------------
.NET Aspire App Host               aspire-apphost          [C#]
Common/.NET Aspire/Cloud
.NET Aspire Application            aspire                  [C#]
Common/.NET Aspire/Cloud/Web/Web API/API/Service
.NET Aspire Service Defaults       aspire-servicedefaults  [C#]
Common/.NET Aspire/Cloud/Web/Web API/API/Service
.NET Aspire Starter Application    aspire-starter          [C#]
Common/.NET Aspire/Blazor/Web/Web API/API/Service/Cloud
.NET Aspire Test Project (xUnit)   aspire-xunit            [C#]
Common/.NET Aspire/Cloud/Web/Web API/API/Service/Test
```

To create a .NET Aspire project using the .NET CLI, use the `dotnet new` command and specify which template you would like to create.

To create a basic .NET Aspire project:

.NET CLI

```
dotnet new aspire
```

To create a .NET Aspire project with a sample UI and API included:

.NET CLI

```
dotnet new aspire-starter
```

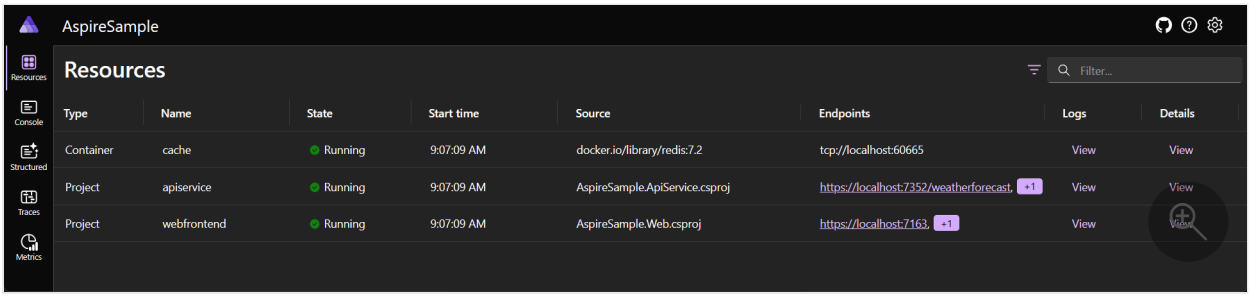
.NET Aspire dashboard

.NET Aspire templates that expose the app host project also include a useful dashboard that can be used to monitor and inspect various aspects of your app, such as logs, traces, and environment configurations. This dashboard is designed to improve the local development experience and provides an overview of the overall state and structure of your app.

The .NET Aspire dashboard is only visible while the app is running and starts automatically when you start the **.AppHost** project. Visual Studio launches both your app and the .NET Aspire dashboard for you automatically in your browser. If you start the app using the .NET CLI, copy and paste the dashboard URL from the output into your browser, or hold `Ctrl` and select the link (if your terminal supports hyperlinks).

```
info: Aspire.Hosting.DistributedApplication[0]
      Aspire version: 8.0.0+d215c528c07c7919c3ac30b35d92f4e51a60523b
info: Aspire.Hosting.DistributedApplication[0]
      Distributed application starting.
info: Aspire.Hosting.DistributedApplication[0]
      Application host directory is: D:\source\repos\docs-aspire\docs\get-started\snippets\quickstart\AspireSample\AspireSample.AppHost
info: Aspire.Hosting.DistributedApplication[0]
      Now listening on: https://localhost:17187
info: Aspire.Hosting.DistributedApplication[0]
      Login to the dashboard at https://localhost:17187/login?t=fd127643c01bd8d1afe61c7e1dbb340f
info: Aspire.Hosting.DistributedApplication[0]
      Distributed application started. Press Ctrl+C to shut down.
```

The left navigation provides links to the different parts of the dashboard, each of which you'll explore in the following sections.



See also

- Unable to install .NET Aspire workload
- Use Dev Proxy with .NET Aspire project

Collaborate with us on GitHub

The source for this content can be found on GitHub, where you can also create and review issues and pull requests. For more information, see our contributor guide.

.NET Aspire feedback

.NET Aspire is an open source project. Select a link to provide feedback:

- Open a documentation issue
- Provide product feedback