

Safely Store Secrets in Development



Matthew Tester

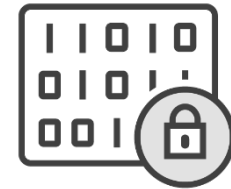
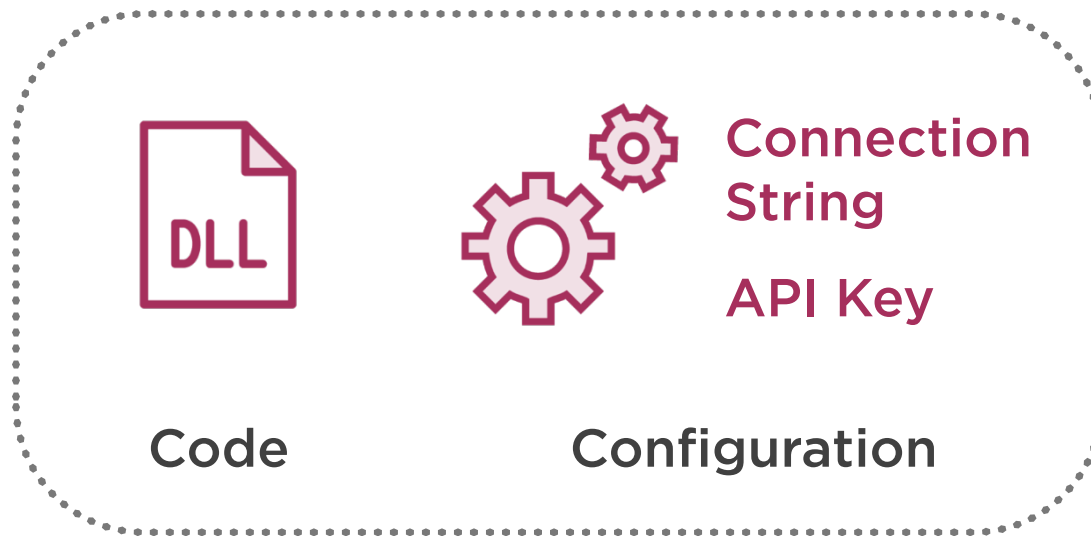
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Wired Brain Coffee

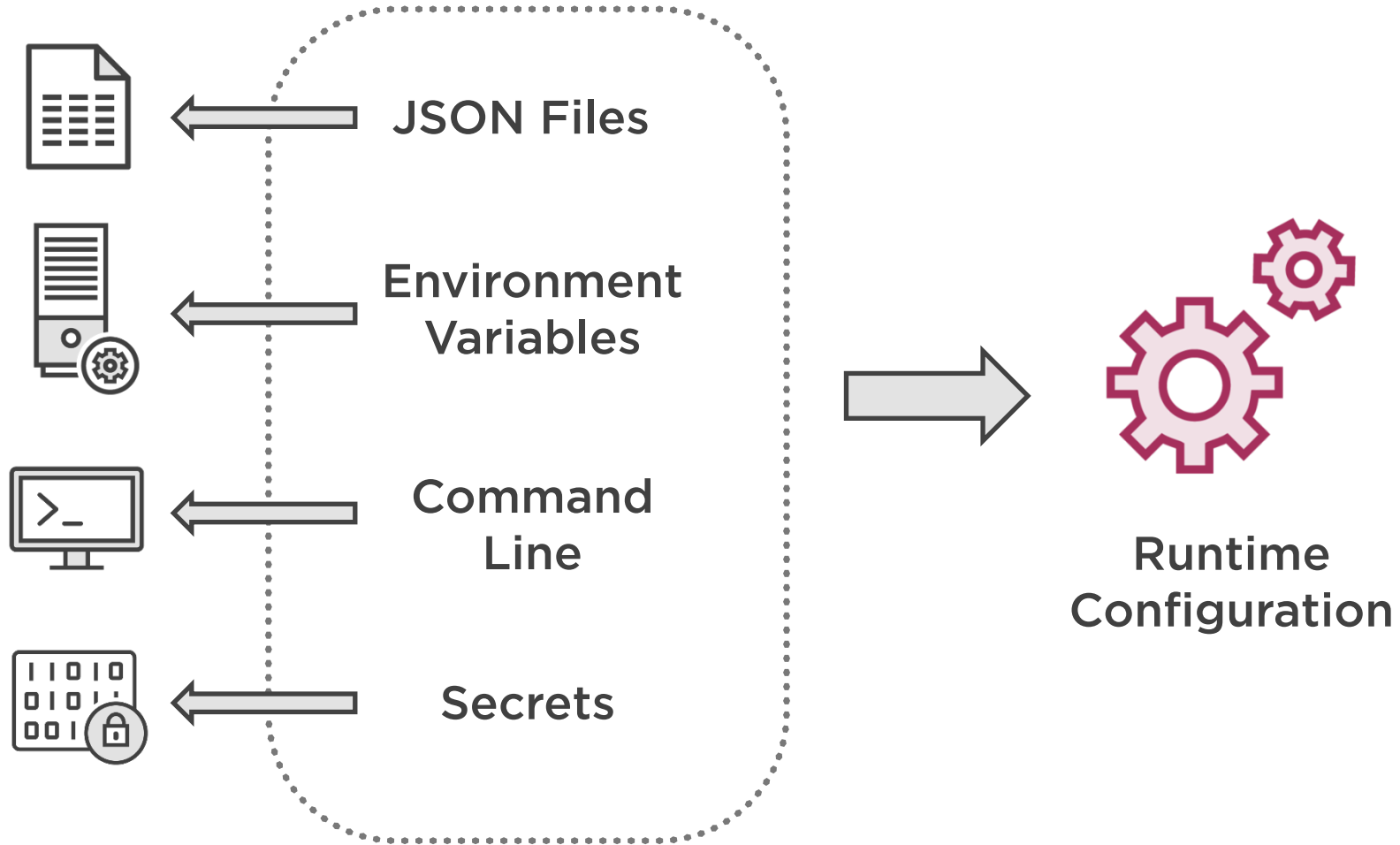
ASP.NET Application



Secrets Store

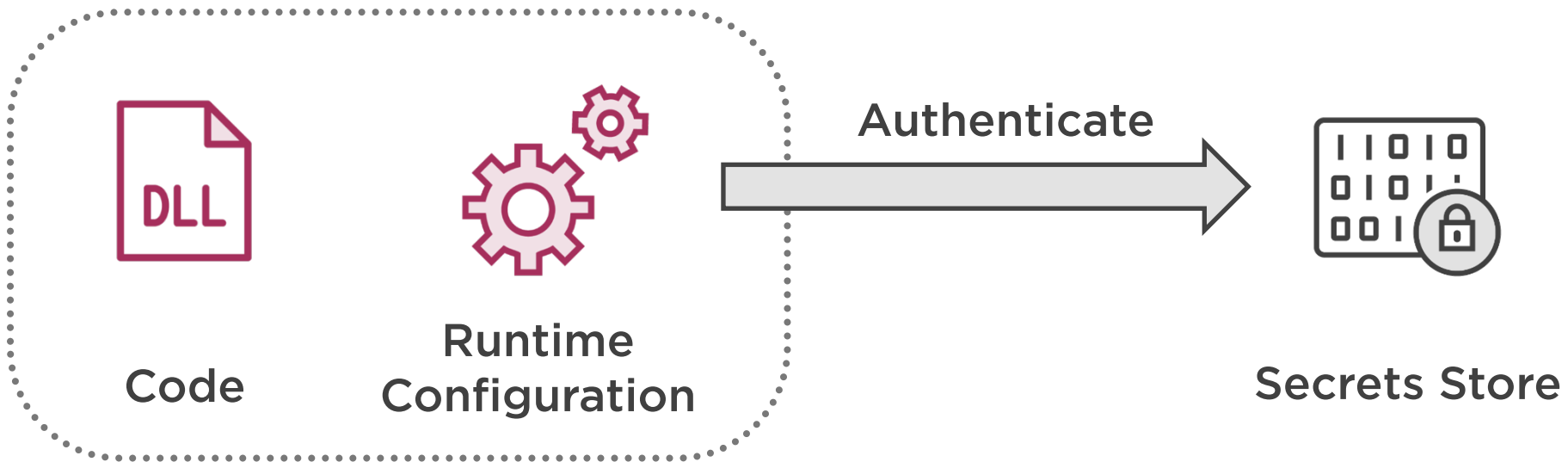


Building Configuration



Wired Brain Coffee

ASP.NET Application



Introducing Secret Manager



Secret Manager



Library Code

Configuration providers

.NET Core, and .NET Framework
4.7.1 and later



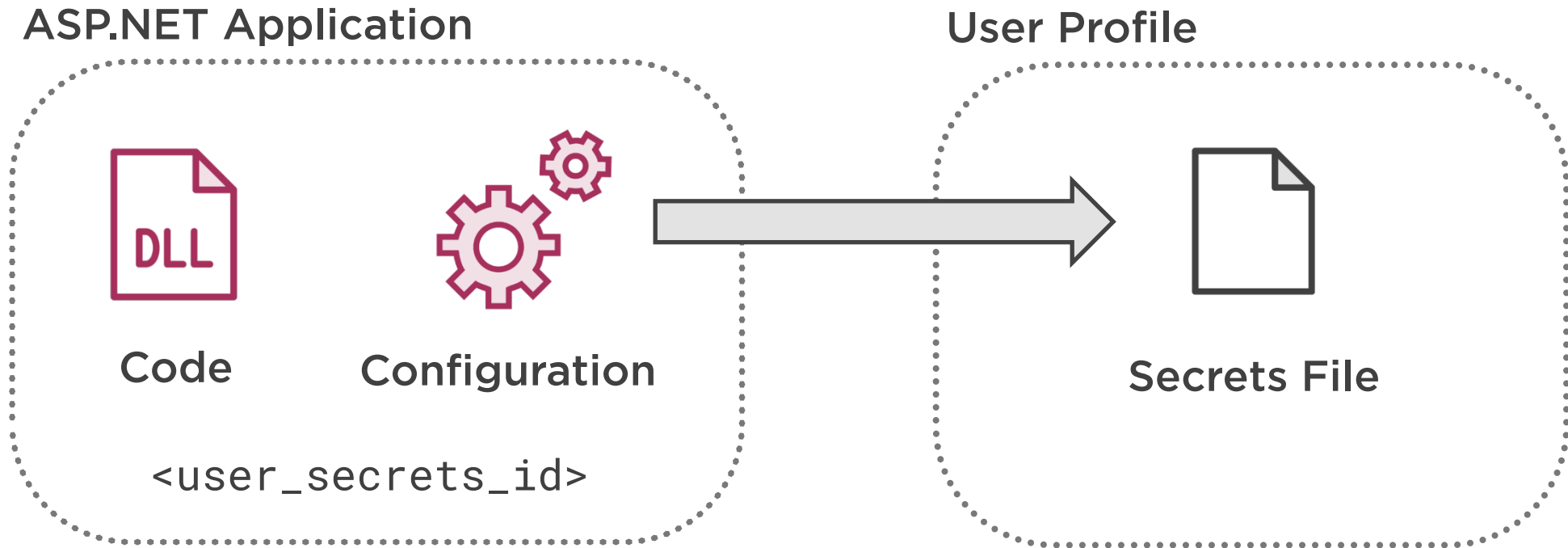
Command Line Tool

Tool to manage development
secrets

.NET Core only



Wired Brain Coffee



Windows: `%APPDATA%\Microsoft\UserSecrets\<user_secrets_id>\`

Linux/Mac: `~/ .microsoft/usersecrets/<user_secrets_id>/`



For Development Purposes Only



No explicit authentication mechanism



Secrets are stored in plain text



Keeps secrets out of source code



Light-weight and simple to use



Demo



Refactor .NET Core Wired Brain Coffee

- Initialize Secret Manager
- Protect hard-coded API Key
- Protect database connection string

Introduce user-secrets tool



Config Builder

```
var builder = new ConfigurationBuilder()  
    .SetBasePath(env.ContentRootPath)  
    .AddJsonFile("appsettings.json",  
        optional: false,  
        reloadOnChange: true)  
    .AddEnvironmentVariables();
```

```
if (env.IsDevelopment())  
{  
    builder.AddUserSecrets<Startup>();  
}
```

```
Configuration = builder.Build();
```



```
//Nested
"ConnectionStrings": {
  "CustomerPortalDb": "...
}
```

```
//Flattened
"ConnectionStrings:CustomerPortalDb": "..."
```

Nested Secrets

A colon, “:”, is used to flatten a nested hierarchy in configuration



Demo



Refactor .NET Framework 4.7.2

- Initialize Configuration Builders
- Protect hard-coded API Key
- Protect database connection string



Config Modes

Strict

- Default mode
- Only replace values if there is a matching key in the target

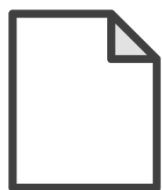
Greedy

- Add all key/value pairs to the target

Expand

- Replace string tokens that appear in target values





Secrets

PaymentAPIKey

CustomerPortalDb

mode: Greedy

ConfigBuilder

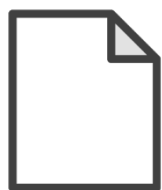


ConnectionStrings



AppSettings





Secrets

AppSetting_PaymentAPIKey

ConnectionString_CustomerPortalDb

```
mode: Greedy  
prefix: AppSetting  
stripPrefix: true
```

ConfigBuilder



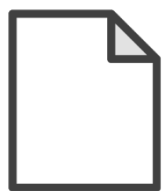
ConnectionStrings



AppSettings

PaymentAPIKey





Secrets

AppSetting_PaymentAPIKey

ConnectionString_CustomerPortalDb

mode: Greedy
prefix: ConnectionString
stripPrefix: true



ConnectionStrings

mode: Greedy
prefix: AppSetting
stripPrefix: true



AppSettings



Change any secrets found
in the code!



Summary



Secret Manager

- Keep secrets out of code
- Uses configuration building phase
- Secrets stored in user profile
- For development only

Summary



.NET Core

- Secret Manager built-in
- Command line tool: user-secrets
- Nested configuration using colons

.NET 4.7.1 onwards

- UserSecretsConfigBuilder via NuGet package
- Different modes: Greedy vs. Strict
- Use prefixes to isolate types of secrets

Change any secrets found in the code!

