



Session 01 — Dev Environment Architecture

A visual diagram showing relationships between GitHub Codespaces, OS, runtimes, dev tools, and the browser preview.

Mermaid diagram (preferred)

```
graph TD
    subgraph DevContainer [DevContainer]
        direction TB
        subgraph OS [Ubuntu (container OS)]
            direction TB
            Node["Node.js (runtime)"]
            NPM["npm / package manager"]
        end
        subgraph DevTools [Dev tools & App]
            direction TB
            Vite["Vite (dev server)"]
            HMR["HMR (Hot Module Replacement)"]
            React["React App (src/*.jsx / components)"]
            Files["Project files (src/, public/)"]
        end
        VSCode["VS Code (remote editor)"]
    end

    Dev -->|opens remote session| VSCode
    VSCode -->|remote connection| DevContainer
    Dev -->|open preview| Browser

    DevContainer --> OS
    OS --> Node
    Node --> NPM
    NPM --> Vite
    NPM --> React
    Files --> React
    React -->|built / served by| Vite
    Vite --> HMR
    HMR --> Browser
    Vite -->|serves on localhost| Browser
```

%% Actors

```
Dev["Developer\n(Browser or VS Code Desktop)"]
Browser(("Browser Preview"))
```

%% Codespace container (contains OS + DevTools + editor config)

```
subgraph Codespace["GitHub Codespace"]
    direction TB
    DevContainer[".devcontainer\n(config)"]
    subgraph OS["Ubuntu (container OS)"]
        direction TB
        Node["Node.js\n(runtime)"]
        NPM["npm / package manager"]
    end
    end

    subgraph DevTools["Dev tools & App"]
        direction TB
        Vite["Vite\n(dev server)"]
        HMR["HMR\n(Hot Module Replacement)"]
        React["React App\n(src/*.jsx / components)"]
        Files["Project files\n(src/, public/)"]
    end
    end

    VSCode["VS Code\n(remote editor)"]
end
```

%% Relationships

```
Dev -->|opens remote session| VSCode
VSCode -->|remote connection| Codespace
Dev -->|open preview| Browser
```

DevContainer --> OS
OS --> Node
Node --> NPM
NPM --> Vite
NPM --> React
Files --> React
React -->|built / served by| Vite
Vite --> HMR
HMR --> Browser
Vite -->|serves on localhost| Browser

%% Classes (styling)

```
class Dev,Browser actorClass
class Node,NPM osClass
class Vite,HMR,React devtoolsClass
class VSCode codespaceToolClass
class DevContainer,Files diagNotes
```

```
%% Visual style definitions
classDef actorClass fill:#ffffff,stroke:#94a3b8,stroke-width:1px,color:#0f172a;
classDef osClass fill:#ecfdf5,stroke:#34d399,stroke-width:1px,color:#065f46;
classDef devtoolsClass fill:#fff7ed,stroke:#fb923c,stroke-width:1px,color:#92400e;
classDef codespaceToolClass fill:#eef2ff,stroke:#7c3aed,stroke-width:1px,color:#3730a3;
classDef diagNotes fill:#f8fafc,stroke:#e2e8f0,stroke-width:1px,color:#0f172a;

%% Optional styling for clarity (some renderers support 'style' for nodes)
style Codespace fill:#f0f9ff,stroke:#60a5fa,stroke-width:2px
```

Legend / Notes

- Codespace = remote container running Ubuntu with your project's config (.devcontainer).
- Node + npm = runtime + package manager used to install/run Vite and the React app.
- Vite = dev server with HMR; serves the app on localhost to the Browser preview.
- VS Code (remote) = editor connected to the Codespace for live editing.

ASCII fallback (for plaintext renderers)

