Model Context Protocol

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Concepts

Roots

Understanding roots in MCP

Roots are a concept in MCP that define the boundaries where servers can operate. They provide a way for clients to inform servers about relevant resources and their locations.

What are Roots?

A root is a URI that a client suggests a server should focus on. When a client connects to a server, it declares which roots the server should work with. While primarily used for filesystem paths, roots can be any valid URI including HTTP URLs.

For example, roots could be:

```
file:///home/user/projects/myapp
https://api.example.com/v1
```

Why Use Roots?

Roots serve several important purposes:

1. **Guidance**: They inform servers about relevant resources and locations
2. **Clarity**: Roots make it clear which resources are part of your workspace
3. **Organization**: Multiple roots let you work with different resources simultaneously

When a client supports roots, it:

1. Declares the `roots` capability during connection
2. Provides a list of suggested roots to the server
3. Notifies the server when roots change (if supported)

While roots are informational and not strictly enforcing, servers should:

1. Respect the provided roots
2. Use root URIs to locate and access resources
3. Prioritize operations within root boundaries

Common Use Cases

Roots are commonly used to define:

Project directories

Repository locations

API endpoints

Configuration locations

Resource boundaries

Best Practices

When working with roots:

1. Only suggest necessary resources
2. Use clear, descriptive names for roots
3. Monitor root accessibility
4. Handle root changes gracefully

Example

Here's how a typical MCP client might expose roots:

```
{
  "roots": [
    {
      "uri": "file:///home/user/projects/frontend",
      "name": "Frontend Repository"
    },
    {
      "uri": "https://api.example.com/v1",
      "name": "API Endpoint"
    }
  ]
}
```

This configuration suggests the server focus on both a local repository and an API endpoint while keeping them logically separated.

Sampling Transports