Designing MCP
the Mathematical Computation Protocol

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MCP Issues and Considerations

- Supporting IAMC
- Simple, powerful, and flexible
- Meeting client-to-server and server-to-client requirements
- Using different types of data-transfer encodings
- Employing stream connection between client and server
- Assuming pier-to-pier interactions
Client Requirements

- Sending computing requests
- Receiving computational results, in indicated encoding forms
- Sending control requests to server
- Receiving control responses (e.g. server status information)
- Sending client status
- Receiving requests from server
- Responding to requests from server
- Interrupting on-going computation
- Disconnecting
Server Requirements

- Receiving computing requests
- Sending computational results, in encoded forms
- Sending control requests to client
- Receiving control responses (e.g. client status information)
- Sending server status
- Responding to control requests from client
- Disconnecting
MCP Protocol

- First line:
  
  Client MCP version
  
  Server MCP version

- Header and body format (HTTP style)

- Header Key-value pairs (HTTP style)
Available Keys

- **Status**: normal, error, ready, busy, terminating
- **ControlRequest**: type, optional
- **ControlResponse**: type, optional
- **Sequence**: linear sequence number (control and compute sequenced separately)
- **Content-Type**: body type (e.g. application/x-mp, or text/MathML) default text/plain
- **Content-length**: bytes
- **Transfer-Encoding**: if any, default none (useful for email transfer)
Example Client Computation Request

Client MCP 1.0
Status: normal
Sequence: 1
Content-Type: application/x-mp
Content-length: 356

Body
Example Server Computation Response

Server MCP 1.0
Status: normal
Sequence: 1
Content-Type: application/x-mp
Content-length: 4000

Body
Example Client Control Request

Client MCP 1.0
Status: normal
ControlRequest: disconnect
Sequence: 7
Example Server Control Response

Server MCP 1.0
Status: normal
ControlResponse: Bye
Sequence: 7
Server MCP 1.0
Status: normal
ControlRequest: SetCookie
Sequence: 1
Content-type: application/binary

Body
Example Client Cookie

Client MCP 1.0
Status: normal
ControlRequest: Cookie
Sequence: 1

Body
Server to Client Requests

- Prompts for input from the user
- Choices for user/client selection
- Dialogue for user/client input
- Setting Cookie
- Disconnecting