# Upgrade-based Negotiation for HTTP/2.0

http://tools.ietf.org/html/draft-montenegro-httpbis-http2-negotiation/

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# Role of Upgrade-based negotiation

**Role #1: A mechanism to use in the absence of any knowledge about the server's HTTP/2 capability, in order to upgrade from HTTP/1.X to HTTP/2**

- If a server at a given port is known to be HTTP/2 capable, no need for negotiation.
- Many ways to acquire knowledge that a server speaks HTTP/2
  - DNS
  - Negotiation at a lower layer of the stack (TLS-NPN)
  - Alternate-Protocol header
  - Previous successful run of this Upgrade-based header
  - Pixie dust, configuration, etc.
- But: Bypassing an upgrade handshake and starting a new Request/Response Exchange with HTTP/2 directly could result in more failures to communicate (e.g., due to inspecting intermediaries)

# Proposal

- Client initiates assuming HTTP/1.1 and proposes HTTP/2 switch via the Upgrade header defined in HTTP/1.1
    - also used by RFC6455 (WebSockets)
- No extra delay
- If server switches to HTTP/2.0:
    - protocol switch is immediate
    - effective within the first round trip
- If server does not switch to HTTP/2.0:
    - server ignores the Upgrade header
    - responds in HTTP/1.1 as usual.
- Further optimizations posible as client could also use
    - HTTP2-<header_name>
    - Ignored by HTTP/1.X servers, consumed by HTTP/2 servers

# Negotiation Flow

## Client attempts a switch to HTTP/2:

```
GET /default.htm HTTP/1.1
Host: server.example.com
Connection: Upgrade
Upgrade: HTTP/2.0
```

## Server accepts the switch (else just respond in 1.X):

```
HTTP/1.1 101 Switching Protocols
Connection: Upgrade
Upgrade: HTTP/2.0

[ HTTP/2.0 frame ]
```