CoAP Protocol Negotiation

draft-silverajan-core-coap-protocol-negotiation

Bill Silverajan TUT
Mert Ocak Ericsson

Main change from -03

- Previous drafts used `.well-known/core` to expose CoAP origin server's available alternative transports
- Discussions in Berlin led towards dropping `.well-known/core` and using CoRE Resource Directory and CoRE Link Format

Current changes from -03:
Removal: link attribute & relation type

- `'tt'` link attribute and `'altloc'` link relation type discontinued (see below in red)

```
REQ: GET /.well-known/core

RES: 2.05 Content
</sensors>;ct=40;title="Sensor Index", tt="tcp ws sms",
</sensors/temp>;rt="temperature-c";if="sensor",
</sensors/light>;rt="light-lux";if="sensor",
<coap+tcp://server.example.com/>;rel="altloc",
<coaps+tcp://server.example.net/>;rel="altloc",
<coap+ws://server.example.com/ws-endpoint>;
  rel="altloc",
<coap+sms://001234567>;rel="altloc"
```

Changes in -04:
New optional 'at' RD parameter

- Extend the Resource Directory's Registration and Update Interfaces

Name	Query	Validity	Description
CoAP Transport URI List	at	URI	Comma separated list of URIs (scheme, address, port, and path) available at the server

- Interaction: EP -> RD

```
Req: POST coap://rd.example.com/rd?ep=node1&
          at=coap+tcp://server.example.com
Content-Format: 40
Payload:
</sensors/temp>;ct=41;rt="temperature-f"; if="sensor",
</sensors/door>;ct=41;rt="door";if="sensor"

Res: 2.01 Created
Location: /rd/4521
```

Changes in -04:
New optional 'tt' RD parameter

- Extend the Resource Directory's Lookup Interface

Name	Query	Validity	Description
CoAP Transport Type	tt		Transport type requested by the client

- Interaction: Client -> RD

```
Req: GET /rd-lookup/ep?ep=node5&tt=*

Res: 2.05 Content
<coap+tcp://[FDFD::123]:61616>;ep="node5",
<coap+ws://[FDFD::123]:61616>;ep="node5"
```

Advantages

- RD provides well-defined interfaces with easy way to extend functionality
- Consistent API: Registrations and Updates managed by origin servers based on lifetime values
- Group function set provides new possibilities
- Support for commissioning tools (via ‘con’)
- RD also supports HTTP
- DNS SD and DNS-based Service Discovery may be possible

Drawbacks

- Alternative transport lifetime currently bound to registration lifetime (unless we introduce a new RD parameter per transport, which is challenging)
- A simple means for clients to signal a server to temporarily enable an alternative transport (for energy-constrained origin servers) is missing