Network Time Protocol (NTP)

- Resource Summary for NTP
- NTP Server Collection Resource
- NTP Status
- NTP Associations

Resource Summary for NTP

<table>
<thead>
<tr>
<th>Resource</th>
<th>URL (BaseURL)</th>
<th>HTTP Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>GET</td>
</tr>
<tr>
<td>NTP server</td>
<td>/api/v1/global/ntp/servers</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>/api/v1/global/ntp/servers/{ntp-server}</td>
<td>Y</td>
</tr>
<tr>
<td>Collection of active servers</td>
<td>/api/v1/global/ntp/servers/active</td>
<td>Y</td>
</tr>
<tr>
<td>NTP status</td>
<td>/api/v1/global/ntp/status</td>
<td>Y</td>
</tr>
</tbody>
</table>

NTP Server Collection Resource

History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOS XE 3.10</td>
<td>Introduced for the CSR1000V platform</td>
</tr>
<tr>
<td>IOS XE 3.14</td>
<td>Introduced for ASR1001-X and ASR1002-X platforms</td>
</tr>
</tbody>
</table>
Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Type</th>
<th>Required for POST and PUT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>kind</td>
<td>string</td>
<td>Mandatory</td>
<td>Object type. Always “collection#ntp-server”</td>
</tr>
<tr>
<td>ntp-servers</td>
<td>array</td>
<td>Mandatory</td>
<td>Array of ntp server objects</td>
</tr>
<tr>
<td>ntp-servers [] .kind</td>
<td>string</td>
<td>Mandatory</td>
<td>Array object type. Always “object#ntp-server”</td>
</tr>
<tr>
<td>ntp-servers [] .ip-address</td>
<td>string</td>
<td>Mandatory</td>
<td>CIDR format: x.x.x.x/nn or name</td>
</tr>
</tbody>
</table>

JSON Representation

```
{
  "kind": "collection#ntp-server",
  "items": [
    { JSON object with kind "object#ntp-server" }
  ]
}
```

Create NTP Server

Resource URI

<table>
<thead>
<tr>
<th>Verb</th>
<th>URI</th>
</tr>
</thead>
<tbody>
<tr>
<td>POST</td>
<td>/api/v1/global/ntp/servers</td>
</tr>
</tbody>
</table>

Example

**JSON Request**

```json
POST /api/v1/global/ntp/servers
Content-Type: application/json
Accept: application/json

{
  "ip-address": "173.25.25.25"
}
```

**Example**

**JSON Response**

201 Created
Location: http://host/api/v1/global/ntp/servers/173.25.25.25
Chapter 6  Network Time Protocol (NTP)

Retrieval All NTP Servers

Resource URI

<table>
<thead>
<tr>
<th>Verb</th>
<th>URI</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET</td>
<td>/api/v1/global/ntp/servers</td>
</tr>
</tbody>
</table>

Properties for Retrieve All

<table>
<thead>
<tr>
<th>Property</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hostname</td>
<td>string</td>
<td>NTP server hostname. Either an IP address or a hostname must be configured. Read-only once the resource is created.</td>
</tr>
</tbody>
</table>

Example

**JSON Request**

GET /api/v1/global/ntp/servers
Accept: application/json

**JSON Response**

200 ok

Content-Type: application/json

```json
{
    "kind": "collection#ntp-server",
    "items": [
        {
            "kind": "object#ntp-server",
            "ip-address": "173.25.25.25"
        },
        {
            "kind": "object#ntp-server",
            "ip-address": "173.25.25.26"
        }
    ]
}
```

Retrieve a NTP Server

Resource URI

<table>
<thead>
<tr>
<th>Verb</th>
<th>URI</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET</td>
<td>/api/v1/global/ntp/servers/{ntp-server-id}</td>
</tr>
</tbody>
</table>
Example

JSON Request
GET /api/v1/global/ntp.servers/172.25.25.25
Accept: application/json

JSON Response
200 Ok

Content-Type: application/json
{
  "kind": "object#ntp-server",
  "ip-address": "172.25.25.25"
}

Delete a NTP Server

Resource URI

<table>
<thead>
<tr>
<th>Verb</th>
<th>URI</th>
</tr>
</thead>
<tbody>
<tr>
<td>DELETE</td>
<td>/api/v1/global/ntp.servers/{ntp-server-id}</td>
</tr>
</tbody>
</table>

Example

JSON Request
DELETE /api/v1/global/ntp.servers/172.25.25.25
Accept: application/json

JSON Response
204 No Content

NTP Status

History

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</thead>
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</tbody>
</table>
## Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>kind</td>
<td>string</td>
<td>“object#ntp-status”</td>
</tr>
<tr>
<td>synchronized</td>
<td>boolean</td>
<td>“false” if system is not synchronized to any NTP peer, “true” otherwise.</td>
</tr>
<tr>
<td>stratum</td>
<td>number</td>
<td>NTP stratum of this system.</td>
</tr>
<tr>
<td>reference</td>
<td>string</td>
<td>IP address of peer that the system is synchronized to. For IPv4 address, the address format is x.x.x.x Other possible values: INIT (initial state) when unsynchronized LOOP – Sync to local clock STEP – clock stepped DOWN – unspecified stratum case</td>
</tr>
<tr>
<td>nominal-freq</td>
<td>number</td>
<td>Nominal frequency of system hardware clock (in Hertz).</td>
</tr>
<tr>
<td>actual-freq</td>
<td>number</td>
<td>Measured frequency of system hardware clock (in Hertz).</td>
</tr>
<tr>
<td>precision</td>
<td>string</td>
<td>Precision of the clock of this system (in Hertz).</td>
</tr>
<tr>
<td>reference-time</td>
<td>number</td>
<td>Reference time stamp in hex UTC.</td>
</tr>
<tr>
<td>clock-offset</td>
<td>number</td>
<td>Offset of the system clock to synchronized peer. It is in ms.</td>
</tr>
<tr>
<td>root-delay</td>
<td>number</td>
<td>Total delay along path to root clock. It is in ms.</td>
</tr>
<tr>
<td>root-dispersion</td>
<td>number</td>
<td>Dispersion of root path. It is in ms.</td>
</tr>
<tr>
<td>peer-dispersion</td>
<td>number</td>
<td>Dispersion of synchronized peer. It is in ms.</td>
</tr>
<tr>
<td>ntp-uptime</td>
<td>number</td>
<td>The uptime of the NTP entity, (i.e., the time since ntp was (re-)initialized not sysUptime!). The unit is timeticks (1/100 of seconds). “xx:xx:xx UTC”</td>
</tr>
<tr>
<td>resolution</td>
<td>number</td>
<td>The time resolution in integer format, where the resolution is represented as divisions of a second—for example, a value of 1000 translates to 1.0 ms</td>
</tr>
<tr>
<td>last-update</td>
<td>number</td>
<td>Indicates when the clock was last updated in milliseconds. The value is 0 if it’s never been updated.</td>
</tr>
</tbody>
</table>
Chapter 6  Network Time Protocol (NTP)

### NTP Status

#### JSON Representation

```
{
  "kind": "object#ntp-status",
  "synchronized": {boolean},
  "statum": {number},
  "reference": "{ipaddress}",
  "nominal-freq": {number},
  "actual-freq": {number},
  "precision": {number},
  "reference-time": {number},
  "clock-offset": {number},
  "root-delay": {number},
  "root-dispersion": {number},
  "peer-dispersion": {number},
  "ntp-uptime": {number},
  "resolution": {number},
  "loop-filter-state": "{string}",
  "drift": {number},
  "system-poll-interval": {number},
  "last-update": {number}
}
```

#### Retrieve NTP Status

**Resource URI**

<table>
<thead>
<tr>
<th>Verb</th>
<th>URI</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET</td>
<td>/api/v1/global/ntp/status</td>
</tr>
</tbody>
</table>

**Example**

**JSON Request**

GET /api/v1/global/ntp/status
Accept: application/json

**JSON Response**

200 Ok

<table>
<thead>
<tr>
<th>Property</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>loop-filter-state</td>
<td>string</td>
<td>The clock state: NSET(never set), FSET(drift set from file), SPIK(Spike),</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FREQ(Drift being measured),CTRL(normal controlled loop), UNSP(unspecified),</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UNKN (unknown)</td>
</tr>
<tr>
<td>drift</td>
<td>number</td>
<td>The frequency offset between the local clock hardware and the authoritative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>time from the NTP servers. The value is X seconds per second.</td>
</tr>
<tr>
<td>System-poll-interval</td>
<td>number</td>
<td>The value is in seconds.</td>
</tr>
</tbody>
</table>
Content-Type: application/json
{
  "kind": "object#ntp-status",
  "synchronized": true,
  "statum": 4,
  "reference": "192.168.13.57",
  "nominal-freq": 250.0000,
  "actual-freq": 249.9990,
  "precision": 2**19,
  "reference-time": "AEB2525E.70597B34",
  "clock-offset": 7.33,
  "root-delay": 133.36,
  "root-dispersion": 126.28,
  "peer-dispersion": 5.98,
  "loop-filter-state": "FSET",
  "drift": 0.0,
  "system-poll-interval": 8,
  "ntp-uptime": 0,
  "last-update": 0
}

NTP Associations

History

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Properties

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<thead>
<tr>
<th>Property</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>kind</td>
<td>string</td>
<td>Must be collection#ntp-server-active</td>
</tr>
<tr>
<td>peer-info</td>
<td>string</td>
<td>Can be one or more of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Synchronized to this peer”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Almost synchronized to this peer”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Peer selected for possible synchronization”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Peer is a candidate for selection”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Peer is statically configured”</td>
</tr>
<tr>
<td>Items</td>
<td>array</td>
<td>List of NTP servers’ run-time information</td>
</tr>
<tr>
<td>Items-kind</td>
<td>string</td>
<td>Must be object#ntp-server-active</td>
</tr>
<tr>
<td>address</td>
<td>ipaddress</td>
<td>Address of peer.</td>
</tr>
<tr>
<td>Ref-clock</td>
<td>ipaddress</td>
<td>Address of reference clock of peer.</td>
</tr>
<tr>
<td>Stratum</td>
<td>number</td>
<td>Stratum of peer.</td>
</tr>
</tbody>
</table>
NTP Associations

Chapter 6    Network Time Protocol (NTP)

NTP Associations

JSON Representation

```
{
  "kind": "collection#ntp-server-active",
  "items": [
    {
      "kind": "object#ntp-server-active",
      "address": "{ipaddress}",
      "peer-info": "{string}",
      "ref-clock": "{ipaddress}",
      "stratum": {number},
      "when": {number},
      "poll": {number},
      "reach": {number},
      "delay": {number},
      "offset": {number},
      "dispersion": {number}
    }
  ]
}
```

Retrieve NTP Server Run-time Information

Resource URI

<table>
<thead>
<tr>
<th>Verb</th>
<th>URI</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET</td>
<td>/api/v1/global/ntp/servers/active</td>
</tr>
</tbody>
</table>

Example

**JSON Request**

```
GET /api/v1/global/ntp/servers/active
Accept: application/json
```

**JSON Response**

```
200 Ok
Content-Type: application/json
{
  "kind": "collection#ntp-server-active",
```
NTP Associations

"items": [
  {
    "kind": "object#ntp-server-active",
    "address": "172.31.32.2",
    "peer-info": "peer is statically configured",
    "ref-clock": "172.31.32.1",
    "st": 5,
    "when": 29,
    "poll": 1024,
    "reach": 377,
    "delay": "4.2",
    "offset": "-8.59",
    "dispersion": "1.6"
  },
  {
    "kind": "object#ntp-server-active",
    "address": "192.168.13.57",
    "peer-info": "peer is statically configured. Peer selected for possible synchronization",
    "ref-clock": "192.168.1.111",
    "st": 3,
    "when": 32,
    "poll": 128,
    "reach": 377,
    "delay": "7.9",
    "offset": "11.18",
    "dispersion": "3.6"
  }
]