

# trivum API documentation

## trivum API

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## trivum HTTP Interface

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The trivum HTTP interface takes requests which can be tested easily by a web browser, and returns replies in XML format.

# 1. Commands

## 1.1. ZoneCommand

Allows to do basic things like switching a zone off, or to change volume.

```
/xml/zone/runCommand.xml?zone=@zoneId&command=commandNumber
```

### zoneId

The ID of a zone. For the list of possible IDs look into the web configuration under [Automation /trivum API](#) or see below the `getAll.xml` example.



Some Actuators may not address the first zone by `@0` but by `@1` due to internal, unused configuration file(s). To fix this, you may reset the whole configuration by: `System / Backup/Restore / Reset all configuration data`

Instead of `@0` the zone name can be given. If it contains special characters rewrite them using `%`:

```
/xml/zone/runCommand.xml?zone=living%20room&command=...
```

### multi command number

This is a numeric command with these possible values:

ZONECMD_POWER_OFF	001	
ZONECMD_MUTE	002	toggle mute
ZONECMD_POWER_TOGGLE	006	
ZONECMD_POWER_ON	007	
ZONECMD_MUTE_ON	680	
ZONECMD_MUTE_OFF	681	
ZONECMD_VOLUME_INC	003	
ZONECMD_VOLUME_DEC	004	
ZONECMD_VOLUME_INC2	009	
ZONECMD_VOLUME_DEC2	010	
ZONECMD_VOLUME_INC5	011	
ZONECMD_VOLUME_DEC5	012	
ZONECMD_ALLOFF	015	
ZONECMD_SNOOZE	017	
ZONECMD_USE_PREV_SOURCE	029	see Zones / zone / KNX/HTTP sources
ZONECMD_JOIN	030	
ZONECMD_UNJOIN	031	
ZONECMD_USE_NEXT_SOURCE	041	see Zones / zone / KNX/HTTP sources
ZONECMD_DEFAULT_LINEIN	048	play default line input of zone
ZONECMD_DEFAULT_STREAMING	050	play default streamer of zone
ZONECMD_DEFAULT_TUNER	051	play default tuner of zone

ZONECMD_VOLUME_DEC_1	080	
ZONECMD_VOLUME_DEC_10	089	
ZONECMD_VOLUME_INC_1	090	
ZONECMD_VOLUME_INC_10	099	
ZONECMD_START_MACRO_1	200	
ZONECMD_START_MACRO_100	299	
MULTIKEY_BASIC_FORWARD	400	skip to next track, preset
MULTIKEY_BASIC_BACKWARD	401	skip to prev. track, preset
MULTIKEY_BASIC_FASTFORWARD	402	
MULTIKEY_BASIC_FASTBACKWARD	403	
MULTIKEY_BASIC_PLAYPAUSE	406	
MULTIKEY_PLAY	431	
MULTIKEY_PAUSE	432	
MULTIKEY_STOP	433	
MULTIKEY_STATION_DOWN	490	
MULTIKEY_STATION_UP	491	
MULTIKEY_NEXT_ALBUM	493	
MULTIKEY_PREVIOUS_ALBUM	494	
MULTIKEY_NEXT_PLAYLIST	495	
MULTIKEY_PREVIOUS_PLAYLIST	496	
ZONECMD_START_PAGING_1	500	(use 500 + paging id)
ZONECMD_START_PAGING_32	531	
ZONECMD_STOP_PAGING_1	550	
ZONECMD_STOP_PAGING_32	581	
ZONECMD_STOP_PAGING_ALL	599	
ZONECMD_PRESET_1	600	
ZONECMD_PRESET_7	606	
ZONECMD_GROUP_START_1	621	
ZONECMD_GROUP_START_8	628	
ZONECMD_GROUP_STOP	630	
ZONECMD_GROUP_STOP_1	631	
ZONECMD_GROUP_STOP_8	638	
ZONECMD_GROUP_STOP_ALL	639	
ZONECMD_STREAMING_NOPLAY	641	
ZONECMD_VOLUME_00	900	
ZONECMD_VOLUME_99	999	
ZONECMD_ROOM_VOLUME_00	1000	
ZONECMD_ROOM_VOLUME_99	1099	

## Examples

call	function
<code>/xml/zone/getAll.xml</code>	List all possible zone ID's.
<code>/xml/zone/get.xml?zone=@0</code>	Get status of a single zone. Optional parameters are: <code>&amp;addSourceBasicData</code> <code>&amp;addSourceStatusData</code>
<code>/xml/zone/getSelection.xml?grouped</code>	List zones with full group informations.
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=50</code>	Switch the first zone to default streaming.

call	function
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=1</code>	Switch the first zone off.
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=15</code>	Switch all zones off.
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=680</code>	Mute on
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=681</code>	Mute off

## 1.2. Set Zone Source

Select a zone source by short name

```
/xml/zone/set.xml?zone=@0&source=@shortSourceName
```

### shortSourceName

text	action	remark
a a1 a3	first analog input first analog input third analog input	Depending on the device model, 0 to 8 analog inputs are supported.
p p5	first FM tuner preset fifth FM tuner preset	Requires that a default FM tuner is configured for the zone.
f f2	first trivum favorite second trivum favorite	
y y2	first trivum playlist second trivum playlist	
i i2	first tunein preset second tunein preset	
s	default stream source of zone	playing recent selection
t	default FM tuner of zone	playing recent frequency

### Examples

API call	remark
<code>/xml/zone/set.xml?zone=@0&amp;source=@a1</code>	switch to first analogue input
<code>/xml/zone/set.xml?zone=@0&amp;source=@t</code>	switch to default FM tuner of zone and play recent frequency
<code>/xml/zone/set.xml?zone=@0&amp;source=@p3</code>	switch to default FM tuner of zone and play station preset 3
<code>/xml/zone/set.xml?zone=@0&amp;source=@f2</code>	switch to default streaming of zone and play trivum favorite 2

<code>/xml/zone/set.xml?zone=@0&amp;source=@i5</code>	switch to default streaming of zone and play TuneIn webradio preset 5
<code>/xml/zone/set.xml?zone=@1@source=@n</code>	C4 only: use a source by card slot n. (n >= 0)
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=15</code>	Switch all zones off.

### 1.3. Set Zone Attribute

Change basic values in a zone, like volume, mute, balance or bass.

API call	remark
<code>/xml/zone/set.xml?zone=@0&amp;volume=10</code>	set volume (0 ... 100)
<code>/xml/zone/set.xml?zone=@0&amp;action=1</code>	same as <code>/xml/zone/runCommand.xml</code> to run a numeric command, in this case <code>ZONECMD_POWER_OFF (1)</code>
<code>/xml/zone/set.xml?zone=@0&amp;balance=0</code>	set balance, from -15 (full left) to 15 (full right)
<code>/xml/zone/set.xml?zone=@0&amp;bass=-5</code>	set bass reduction or enhancement, from -15 to 15
<code>/xml/zone/set.xml?zone=@0&amp;treble=5</code>	set treble reduction or enhancement, from -15 to 15

### 1.4. trivum Favorites

To create trivum favorites:

- play some music content, like a NAS album
- then select `⋮` at the right top
- then select "Add to trivum favorites".

Get the list of trivum favorites:

`/api/v1/trivum/favorite.xml`

Play a trivum favorite:

`/xml/zone/set.xml?source=@f1&zone=@0`

You may also add options:

option	remark
<code>&amp;sequence=random-sequential</code>	select a random start track
<code>&amp;sequence=random-random</code>	play in permanent random order

### 1.5. trivum Playlists

Get the list of trivum playlists:

`/api/v1/trivum/playlist.xml`

Play a trivum playlist:

`/xml/zone/set.xml?source=@y1&zone=@0`

You may also add options:

option	remark
<code>&amp;sequence=random-sequential</code>	to start at a random track
<code>&amp;sequence=random-random</code>	to play only random tracks

## 1.6. TuneIn Favorites

These can also be created by  at the right top while a TuneIn station is playing.

Get the list of TuneIn favorites:

`/api/v1/tunein/favorite.xml`

Play a TuneIn favorite:

`/xml/zone/set.xml?source=@i1&zone=@0`

## 1.7. FM presets

List FM presets:

`/xml/system/getTunerStationList.xml`

*On C4 this shows the system wide list of FM presets, but no local presets stored per FM tuner card.*

## 1.8. NAS status and control

API call	remark
<code>/xml/system/getMusicCenterStatus.xml</code>	get NAS library status
<code>/xml/system/scanMusicCenterShares.xml</code>	rerun full NAS scan

## 1.9. Group management

Groups can be created, changed or removed by one call:

```
/xml/zone/createGroup.xml?zone=zVisu&oldgroup=zMaster&members=++-----
```

Parameters:

name	remark
------	--------

zVisu	index of the current zone of the visualization client
zMaster	index of the group master whose music should be used (if both zones are currently playing different sources)
+/-	characters telling graphically which zones should take part in a group. for example, with a 4 zone system, type 4 characters or less (is filled up with - automatically).

### Example: second zone joins playback of first zone

- first zone is playing a stream, second zone is playing FM tuner, all other zones are off.
- second zone should be added to a group with first zone, and it should take over music from first zone (the stream).

```
/xml/zone/createGroup.xml?zone=1&oldgroup=0&members=++--
```

Result: the second zone starts playing the same stream as first zone.

### Example: first zone joins playback of second zone

- first zone is playing a stream, second zone is playing FM tuner, all other zones are off.
- first zone should be added to a group with second zone, and it should take over music from second zone (the tuner).

```
/xml/zone/createGroup.xml?zone=0&oldgroup=1&members=++--
```

Result: first zone starts playing the same FM tuner as second zone.

This means if both zones are playing different sources then "oldgroup" decides which music to play after the group join.

### Example: second zone should leave the group

```
/xml/zone/createGroup.xml?zone=0&oldgroup=0&members=+---
```

Relevant here is the change from + to - in the members list.

### Change volume level within a group

Within a group, zones normally do not use isolated volume levels, but a change in volume affects all group members.

This interdependency is handled by the call:

```
/xml/zone/setVolume.xml
```

By default, this call will not simply **set** an absolute volume level, but it **steps a bit** into the direction of a given target volume. This is best used with a + or - button in your visualization.

API call	remark
<code>/xml/zone/setVolume.xml?id=@0&amp;volume=0</code>	Step the group volume downwards for the whole group. id is any zone ID from the group. The volume of all zone members will be decreased a few steps.
<code>/xml/zone/setVolume.xml?id=@0&amp;volume=99</code>	Step the group volume upwards for the whole group. The volume of all zone members will be increased a few steps.
<code>/xml/zone/setVolume.xml?id=@0&amp;groupMemberVolume=99</code>	Increase volume of a single zone step wise, not affecting other group members.
<code>/xml/zone/setVolume.xml?id=@0&amp;groupMemberVolume=0</code>	Decrease volume of a single zone step wise, not affecting other group members.
<code>/xml/zone/setVolume.xml?id=@0&amp;stop</code>	Stop volume stepping immediately.
<code>/xml/zone/setVolume.xml?id=@0&amp;groupMemberVolume=50&amp;absolute</code>	Set <b>absolute</b> volume for a single zone, isolated from other group members. (Use with care.)

To get the new volume level informations within a group make a `getChanges` call and look into the volume status list.

`/xml/zone/getChanges.xml?zone=@0&visuid=90&apiLevel=2&now`

**Example output**, if grouped, under zone / status:

```
<zone>
  ...
  <status>
    <volume>17</volume> - volume of zone making the getChanges call
    ...
    <group>
      <zone>0</zone>
      <volume>17</volume> - volume for zone id 0
    </group>
    <group>
      <zone>1</zone>
      <volume>26</volume> - volume for zone id 1
    </group>
    <group>
      ...
    </group>
  <groupMembers>2</groupMembers>
</status>
</zone>
```

For a full explanation of `getChanges` see [Get Zone Status](#).



## 1.10. Paging

Pagings must be configured in the web configuration. Then the following calls can be used:

### Start paging

```
/xml/paging/start.xml
```

Parameters

name	description
id	paging ID, 0 - 31
volume	optional, 5 - 100. if not supplied the configured paging volume level is used.
autostoptime	optional, 5 - 100 seconds. if not supplied the configured stop settings are used.

### Example

```
/xml/paging/start.xml?id=0&volume=10&autostoptime=10
```

A paging stops automatically after the defined time, but you may stop it earlier by calling:

```
/xml/paging/stop.xml?id=0
```

## 2. Interactive Music Selection

Starts with:

```
/xml/system/getWebTouchMenu.xml?which=music&zone=@0&visuid=90
```

This produces records like:

```
<row>
  <type>action</type>
  <mode>menu</mode>
  <action>/xml/system/getWebTouchMenu.xml?which=trivumFavorites&keypad=4</action>
  <icon>/imgs/visuIconServiceFavorites_128px.png</icon>
  <text>trivum_20favorites</text>
</row>
```

then, per record:

- decode and display the text field in your visualization.  
\_20 means a character with Ascii Code 0x20 (a space).
- if touched, call the action url and display the next menu level.



Do not rely on the permanent availability of specific menu levels.

Especially the menus provided by music services may change over time.

## 3. Get Zone Status

### 3.1. Synchronous

Poll the status of a zone with one short API call:

```
/xml/zone/getChanges.xml?zone=@0&visuid=90&apiLevel=2&now
```

Parameters

name	function
<code>visuid</code>	a number from 1 to 99 to identify your external visualization instance. within this API document, <code>visuid=90</code> is used for test requests.
<code>apiLevel</code>	should always be 2. this will produce <code>button</code> xml objects under <code>keypad / basic</code> .
<code>now</code>	tells the server to return the new zone status immediately, and to close the connection. without <code>&amp;now</code> the call would block until a timeout, or until a change in the zone status informations.
<code>reload=1</code>	if two visualizations access the same server with the same <code>visuid</code> an error "used twice" may appear. in this case the most recent visu should add <code>&amp;reload=1</code> on the first call, to tell clearly it is the most recent visualization.

#### About Control units (Visualizations)

If you send requests with `visuid=90` a *Control Unit* object with ID 90 is created in the server.

You can get the list of current Control Units in the web configuration, under *Control Units*.

After first access, the unit is listed as "Not configured". As soon as you change it's configuration, e.g. by setting the option "Off by a short press on power", it is called *Configured*, and later cleanups of the Control Units list will not delete this one.

If there are no requests for this unit, after some time it will be listed under "currently inactive control units".

### 3.2. Asynchronous

This means a HTTP call will not return immediately, but it will block until something changes.

Example:

```
/xml/zone/getChanges.xml?zone=@0&visuid=90&apiLevel=2
```

Notice that `&now` is missing. The following will happen:

*on first API call:*

A Control Unit with ID 90 is created, and linked with the first zone. The API call returns immediately, with full status data of the zone.

*on all further API calls:*

The existing Control Unit 90 is reused. The API call may block, until:

- a timeout is reached (10 seconds approx.). in this case you get a reply like:  

```
<rows><system><timeout>1</timeout>
```
- or until something changed, for example, the volume in the zone.

if (many) status data has changed at the server between two `getChanges` calls, the call may not block at all, but return the new status immediately.

when you receive a timeout, just re-run the `getChanges` immediately. this means you may run `getChanges` endlessly, in a loop, for example in a separate I/O thread. Because a request returns only on changes, this will cause no load problems with the server.

when you do not receive a timeout, i.e. the call returns immediately or after a few seconds (as soon as something has changed), then process the status data, and then re-run the `getChanges` request.

## 3.3. Appendix: schematic example for a Visu Client Application

### 3.3.1. Single Thread Application

This requires that you can test, in your programming language, if reply data for a socket exists (via `select()` call).

#### Main Thread

- start: send 

```
/xml/zone/getChanges.xml?visuid=90&now
```
- loop begin: update the GUI.
  - process input events from user.
  - send synchronous commands like:  

```
/xml/zone/runCommand.xml?...
```

  
receive reply, check rc AND process xml status data (same as with `getChanges` replies)
  - check if reply data exists for ongoing `getChanges` call (in C code: `select()` call on socket)

IF data exists from trivum server:

- Look for `<userdata name="rc">0</userdata>`.  
If NOT present  
  \_ process the error and wait a few seconds.  
Else if NOT a timeout  
  \_ process xml reply (status data)  
  Endif  
  async call (just send)  
  `/xml/zone/getChanges.xml&visuid=90&onlyChanges`  
  Endif
- if no data from server arrive within 1 minute
  - async call (just send)  
  `/xml/zone/getChanges.xml&visuid=90&onlyChanges`  
  endif
- re-run loop

### 3.3.2. Two Thread Application Example

Can be used if you prefer to run blocking receives on sockets in a separate I/O thread.

#### Main Thread

- update the GUI.
- process input events from user.
- send synchronous commands like:  
  `/xml/zone/runCommand.xml?...  
  receive reply, check rc AND process xml status data  
  (same as with getChanges replies)`
- receive status data and errors from Status Thread.
- re-run this loop.

#### Status Thread

- IF on first loop:
  - send `/xml/zone/getChanges.xml?visuid=90&now`  
  ELSE
  - send `/xml/zone/getChanges.xml?visuid=90&onlyChanges`
- receive reply (this is blocked up to 10 seconds)
- Look for `<userdata name="rc">0</userdata>`.  
If this is NOT present then there is an error.  
Make sure not simply to re-run the loop on errors,  
but at least wait a few seconds, and tell the Main Thread.
- Look for `<rows><system><timeout>1</timeout>`.  
IF this is present

- re-run the loop immediately.  
ELSE
  - process the reply status data,  
and copy new status data to Main Thread.
- re-run this loop.

## 4. Simple Integration Guide

A most simple approach, step by step, with some example reply data.

If you want to integrate trivum into a home automation server, normally you want to query two things:

### 4.1. Overall zone status

```
/xml/zone/getAll.xml
```

For example, with Crestron it should be possible to call this by the TCP Client, with a call like

```
SendString(tcpClient, "GET /xml/zone/getAll.xml HTTP/1.1\r\n\r\n");
```

It produces an XML overview:

```
<rows>
  <zone>
    <class>zone</class>
    <id>0</id>
    <description>Room 1</description>
    <status>on</status>
    <volume>0</volume>
    <groupmaster>255</groupmaster>
  </zone>
  <zone>
    <class>zone</class>
    <id>1</id>
    <description>Room 2</description>
    <status>off</status>
    <volume>15</volume>
    <groupmaster>255</groupmaster>
  </zone>
  <zone>
    <class>zone</class>
    <id>2</id>
    <description>Room 3</description>
    <status>off</status>
```

```
<volume>15</volume>
<groupmaster>255</groupmaster>
</zone>
...
```

With a non XML capable client like Crestron, processing may look like this (untested example):

```
STRING response[5000];
STRING zoneNames[4][20];
INTEGER pos, startPos, endPos, zoneCount;
zoneCount = 0;
pos = 1;
WHILE ((pos = Find("<description>", response, pos)) > 0) {
    startPos = pos + 13;
    endPos = Find("</description>", response, startPos);
    IF (endPos > startPos) {
        zoneNames[zoneCount] = Mid(response, startPos, endPos - startPos);
        zoneCount = zoneCount + 1;
    }
    pos = endPos + 14;
}
```

## 4.2. Single zone status

```
/xml/zone/get.xml?zone=@0&addSourceBasicData&addSourceStatusData
```

produces for example:

```
<rows>
  <runtime>
    <class>zone</class>
    <id>0</id>
    <source>
      <description>SC344m_201008153.66</description>
      <status>
        <sourceStatusInfoCount>0</sourceStatusInfoCount>
        <streamStatus>5</streamStatus>
        <streamLength>0</streamLength>
        <streamPosition>331</streamPosition>
        <artist>Jazeek</artist>
        <album></album>
        <track>LV</track>
        <service>webradio</service>
        <imageUrl>http://cdn-
profiles.tunein.com/s45087/images/logod.jpg?t=2</imageUrl>
        <playerIP>127.0.0.1</playerIP>
        <playerPort>1333</playerPort>
```

```

<info>
  <key>WebRadio</key>
  <value></value>
  <size>0</size>
</info>
<info1></info1>
<infoPlayingSource>visuIconPlayingTuneIn_128px.png</infoPlayingSource>
<info2>LV_20_2F_20Jazeek</info2>
<info>
  <key>Artist</key>
  <value>Jazeek</value>
  <size>0</size>
</info>
<info>
  <key>Track</key>
  <value>LV</value>
  <size>0</size>
</info>
<info>
  <key>Status</key>
  <value>Playing 24.0 kHz</value>
  <size>1</size>
</info>
<info>
  <key>Service</key>
  <value>TuneIn</value>
  <size>1</size>
</info>
<info>
  <key>TuneIn favorite</key>
  <value>Favorite station</value>
  <size>1</size>
</info>
<infoCount>6</infoCount>
<mostImportantInfo>0</mostImportantInfo>
<infoLevel>0</infoLevel>
</status>
</source>
<outputcount>1
</outputcount>
<output1>
  <description>SC344m_201008153.66</description>
</output1>
<status>on</status>
<volume>0</volume>
</runtime>
...
</rows>

```

## 4.3. Run a command

Once the zone id's are known, play something like in the following examples. They mainly use a [multi command number](#) as listed further up this document.

call	function
<code>/xml/zone/set.xml?zone=@0&amp;source=@f1</code>	play first favorite in first zone
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=48</code>	play line input
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=9</code>	increase volume by 2 steps
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=10</code>	reduce volume by 2 steps
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=6</code>	toggle zone on/off
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=2</code>	toggle mute
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=51</code>	play tuner
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=400</code>	skip to next playlist track, or tuner preset
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=401</code>	skip to previous playlist track, or tuner preset
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=41</code>	play first or next KNX/HTTP source of zone. (define up to 8 of such sources in setup.)
<code>/xml/zone/runCommand.xml?zone=@0&amp;command=29</code>	play previous KNX/HTTP source. (this can be any action, like play a favourite, line input, or tuner station.)