

Zoom API as a Data Resource

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Zoom API - Functionality

- Utilizes requests to return data from Zoom dashboard webpages
- Primary usage is to automate the scheduling and maintenance of zoom meetings across multiple users
- This project engages the API to extract, compile and store zoom meeting quality metrics to assess quality of virtual visits
- API authentication does not require our team direct sign in access to main account (utilizes Web Tokens for authentication of the API)

Relevant Data Extracted

- Host user (Physician/healthcare practitioner/clinical department)
- Meeting Participants (patient, interpreter if requested/available)
- Date/time of meeting
- Epic CSN number
- Devices used, including computer, microphone and camera equipment
- Zoom Version of all participants
- Internet connection type (wifi, ethernet, etc)
- Meeting Quality Metrics for each relevant minute of a zoom meeting
- Method left (was meeting ended, or disconnected?)

Examples of Quality Metrics

- Types of Metrics:
 - Audio/Video Bitrate: Amount of data transferred per second (Kbps)
 - Audio Frequency (kHz)
 - Audio/Video Latency: delay in sending of data packets (ms)
 - Audio/Video Jitter: variation in time of sending of data packets (ms)
 - Video Frame Rate: Number of frames per second (fps)
 - All metrics give input (quality of user data) and output (quality of data received by user)
- Zoom's Recommendation for Optimal Metrics:
 - Audio: > 60 kbps || Video: > 600 kbps
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 - Frequency: 16 - 48 kHz
 - Latency: < 150 ms
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 - Jitter: <= 40 ms
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 - Framerate: Roughly 30 fps

Methodology: Analysis of Zoom Meeting Quality

- All data is assembled into one large relational database
- Min/Max/Mean of each metric is calculated
- Proportion of minutes with “unacceptable” metrics to the total recorded minutes in a zoom call is calculated
- Meetings with a proportion of over 40% are flagged as a poor quality meeting for that metric
- Likewise for meetings that have users unexpectedly disconnected

Potential Use Cases: Aggregate Data - Audio/Video Issues

- 55% of virtual visits demonstrated *audio issues* (potentially noticeable audio quality loss)
- 9.6% of virtual visits demonstrated *severe audio issues* (potentially interrupted or blocked ability to give care during the visit)
- 46% of virtual visits demonstrated *video issues* (potentially noticeable video quality loss)
- 12.2% of virtual visits demonstrated *severe video issues* (potentially interrupted or blocked ability to give care during the visit)

Potential Use Cases: Aggregate Data - Zoom Version

- 70% of virtual visit hosts (care giver) were using Zoom version 5.7 or newer
- 15% were using Zoom version 5.0 or older
- 60% of attendees (patients, advocate, interpreter, etc) were using Zoom version 5.7 or newer
- 10% of attendees were using Zoom version 5.0 or older

Potential Use Cases: Aggregate Data - Devices

- 93% of virtual visit hosts use a Windows or Mac computer when connecting (55% windows)
- 6.2% hosts connect via iOS, Android, iPad, or other Mobile device
- 66.9% of attendees connect via a Windows or Mac computer
- 22.8% connected via iOS, Android, iPad, or other Mobile device

Other Potential Uses

- EDI/access analysis
- Internal infrastructure - identifying clinics/hosts who are in need of upgrades, clinic by clinic aggregates, etc
- Patient intervention - outreach for users with consistent issues
- Technical support - identify particular metrics that cause issues to assist with support

Current Status

- About 120,000 zoom visits have been collected across about 3000 Zoom account users (physicians and health care providers) over a 6 month period

Next Steps

- Establish permanent, secure API access
- Complete processing of existing meeting data
- Automate regular update to collect new meetings and assemble into current dataset
- Upload data to BCH 360 or another BCH data storage infrastructure
- Learn more about Zoom API use across department to avoid rate limit issues