WaitTime™

What is WaitTime?

WaitTime is a **patented, real-time and historical** artificial intelligence software that uses state-of-the-art imaging techniques to monitor crowd behavior in large scale venues.

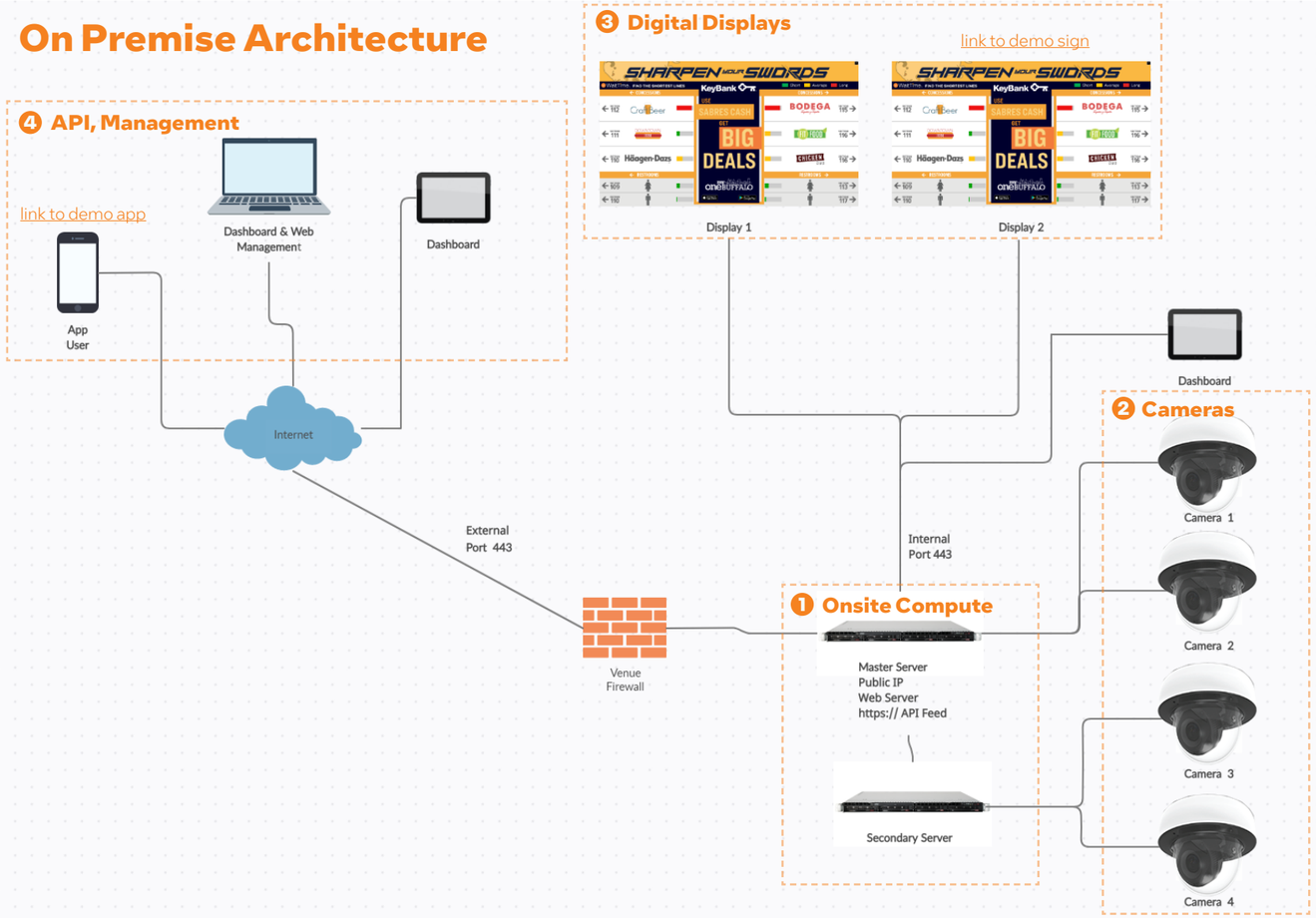
The data generated from WaitTime software leverages operations and guest engagement platforms to enable **real-time smart decision making, inform operations management, and engage guests in movement and distribution solutions.**

How does it work?

Waitime leverages the RTSP feeds from cameras and processes the video files onsite at **10 frames per second.** There are **four unique algorithms** that interpret the images differently allowing WaitTime to provide crowd solutions in dynamic and complicated environments. The camera location and specification is unique to each algorithm. See below for more insight on each algorithm.

WaitTime **does not identify personal information**- people are identified based on set parameters looking for human sized objects moving through the frame.

On Premise Architecture



Technical Components

[1] On site Compute: Hyperflex, UCS Servers, VM Processes camera feeds, hosts WaitTime API, provides html links for digital displays and mobile. Generates reports.

Intel Xeon Server Specs for 30 Cameras
- 30 - 1080P @ 24FPS - video streams or 30 - (360 Camera) 2112x2112 @ 10FPS - video streams

Bare Metal Server or VM built from a single host with no shared resources
- 2 x Intel Gold 6338N 32cores/64threads (8 memory channels)
- 16 x 16GB DDR4-3200 Memory (one 16GB DIMM must be populated in all 8 channels per cpu)
- *Or DDR5 4th/5th Gen CPU*
- 2 x Intel 5th Gen Gold 6530 or similar 32cores/64threads (8 memory channels)
- 16 x 16GB DDR5-4800 Memory (one 16GB DIMM must be populated in all 8 channels per cpu

Hard drive configuration
- Drive C: OS Drive 256GB or similar size SATA SSD or M.2 SSD single drive or raid 1 for redundancy (Windows11 Pro or Windows Server 2019+)
- Drive D: 2 x 2TB SATA SSD in raid 1 configuration
- Drive E: 2TB SATA SSD single drive non raid
- Drive F: 2TB SATA SSD single drive non raid
- Drive G: 2TB SATA SSD single drive non raid
- Or All five drives configured in a Raid 5 setup
- 2 x 10GbE RJ-45 ports

[2] Cameras:
- RTSP feeds for monitored areas
- 1 per monitored queue or threshold
- Cat5e+ to each camera locations
- Typically set to 24 frames per second

[3] Digital Displays:
- Real-time html link hosted on WaitTime on site server

[4] API, Management:
- Real-time html link integrated in venue app
- Management portal accessible via web to control sensor

WaitTime Algorithms

Which algorithm should we use?

WaitTime will work with the client to determine which algorithm works best for the given scenario.

The WaitTime algorithms are either granular or density oriented. Granular algorithms provided specific number of people as their output. Density algorithms provide generic percentages of occupancy.

The algorithm is chosen based on the granularity required to solve the given problem as well as the spatial parameters for where a camera can be mounted.

Entry and Exit [Overhead]

Entry and exit algorithm at convention center hall sharing occupancy of hall with operators.

Description: Occupancy counting by monitoring in and out over threshold. Parameters include magenta boarder for area of interest, blue line for "entry" and yellow line for "exit".

Applications: Occupancy via threshold, convention halls, retail, S&E clubs, casinos

Output: Granular, number of people

Queue [Overhead]

Queue algorithm at concession sharing waits with guests and operators.

Description: Provides wait time via number of people in line and service rate. Parameters include magenta boarder for area of interest, blue line for "front of line".

Applications: Organically forming queues, concessions, ticketing, transaction spaces

Output: Granular, number of people

Stanchion [Overhead]

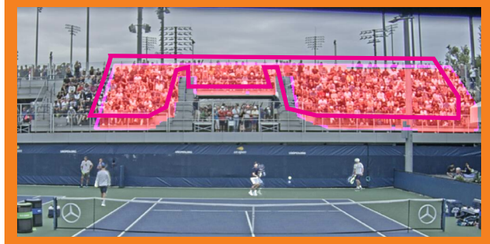
Stanchion algorithm at concession sharing waits with guests and operators.

Description: Provides wait time via number of people in line and service rate. Parameters include magenta boarder for area of interest, blue line for "front of line".

Applications: Stanchioned forming queues, concessions, ticketing, transaction spaces

Output: Granular, number of people

Massing [Z-angle]



Massing algorithm at US Open shared seating availability with guests via mobile app.

Description: Provides percentage of occupancy or business of defined area. Parameters include magenta boarder which defines "area".

Applications: Gate ingress, Low Ceiling Heights, Outdoor spaces.

Output: Density Algorithm, percentage of occupancy