



ID-WELCOME

TECHNICAL DESCRIPTION

IDWL.TI.DOC.990

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1. INTRODUCTION (PURPOSE)

Id-Welcome is a software product for demonstrating personalized media content.

The System is designed to automatically show the address content, greeting employees and visitors to the offices by face identification on the client's equipment: monitors, projectors, etc.

The System is designed for:

- Demonstrating welcome-messages
- Automatic update of templates in the biometric profile
- Targeted content output based on the results of identification of people in front of the camera
- Collecting statistics on content viewing (viewing score, gender, age)
- Flexible system configuration (working in different modes)

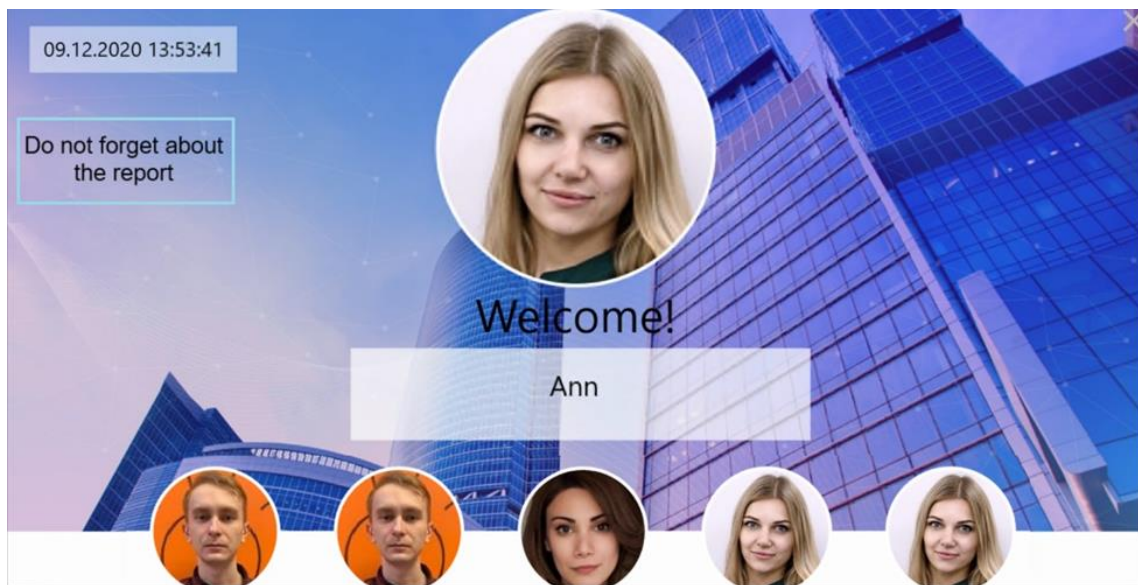


Figure 1. Welcome screen

These screens are set up with the help of a specialized constructor, which provides great flexibility while working with the System.

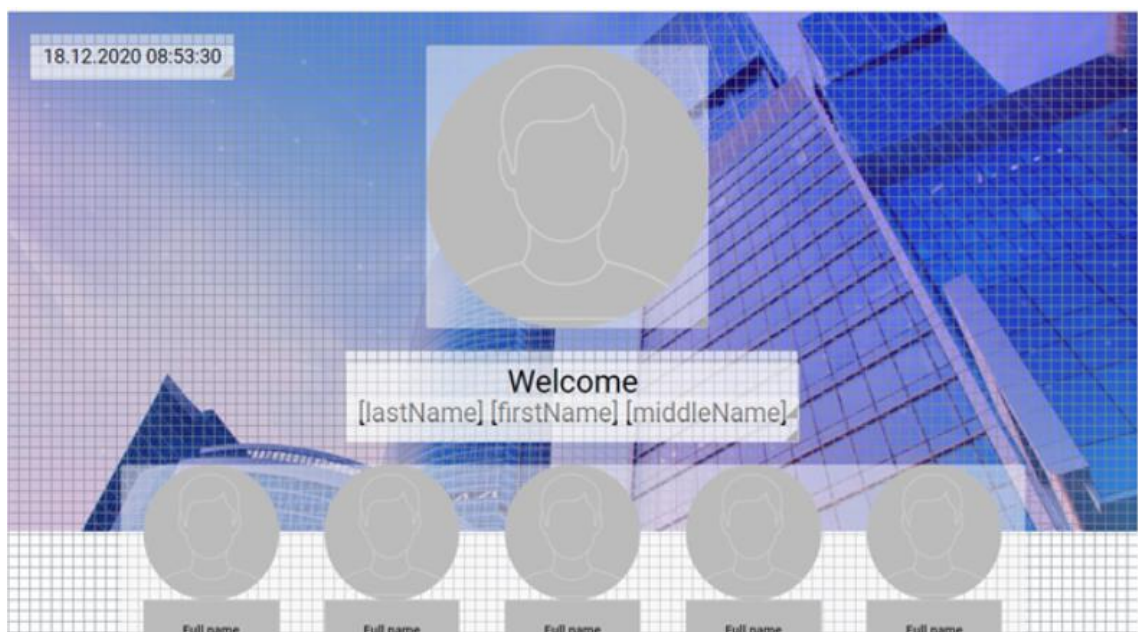


Figure 2. Layout of content in the constructor

The System is scalable and supports multiple cameras and multiple output devices.

2. SOFTWARE DESCRIPTION

2.1. SYSTEM COMPONENTS

For the correct functioning of the System, the following minimal set of equipment is required:

- Server for the System Core
- Video preprocessing server (if needed)
- Display component (Digital Signage, videowalls)
- Net cameras
- Network switches to ensure data transfer between System components

The detailed description of the equipment recommended characteristics is indicated below.

2.2. ARCHITECTURE

The System consists of the following components:

- **Id-Welcome Core** — the server part of the system, consisting of separate services, including the product configuration interface (constructor), recognition algorithms and a database.
- **Id-Welcome Application** — the part of the system responsible for interacting with the equipment and displaying welcome screens to visitors
- **Video Preprocessing Server (Tracker)** — an application that processes the video stream from the camera for face recognition.

The System can be installed according to the following scenarios:

- 1) The system components are installed on the server and the client's device:
 - **Server:** Id-Welcome Core + Tracker
 - **Client's device:** Id-Welcome Application
- 2) All system components are installed on the server:
 - **Server:** Id-Welcome Core + Tracker + Id-Welcome Application

The deployment scheme of the System is given below (**Figure 3**).

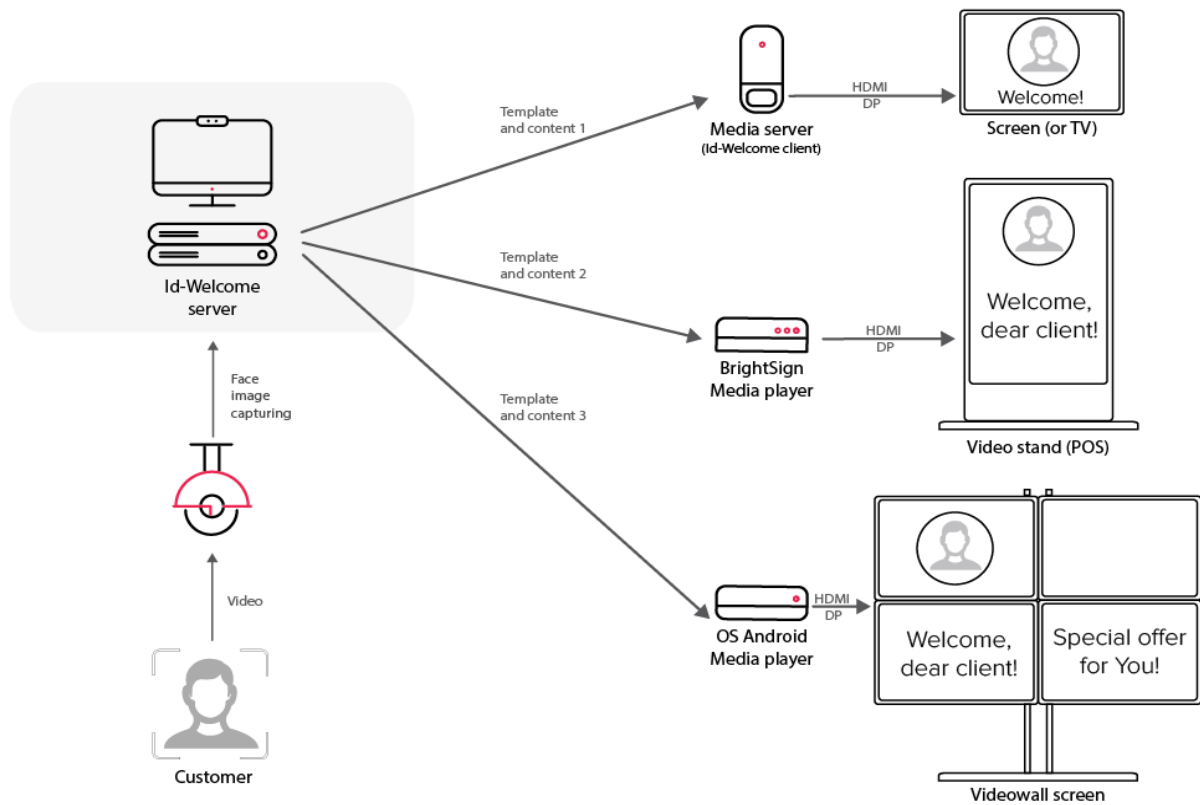


Figure 3. The deployment scheme of the solution

2.3. TECHNOLOGIES

The System is developed using the following programming languages and software:

- Golang
- C#
- Angular
- RabbitMQ
- Nginx
- PostgreSQL
- Redis

2.4. LIST OF ID-WELCOME CORE SERVICES

Id-Welcome Core includes the following services:

Table 1. Id-Welcome Core services description

Server	Description	Port
Nginx	A web server and mail proxy server	80, 443, 23231
Postgre SQL	Free and open-source relational database management system (RDBMS)	5432
Rabbit MQ	Service providing work with data queues	5672, 15672
Redis	NoSQL database, open-source software	6379
mkvz-tracker-go	Video pre-processing service (tracker)	8001
mkvz-tracker	Video pre-processing service (tracker)	8001
mkvz-launcher	Client application management service	8876
mkv-server-report	Report service	11084
mu-server-api	Notifications service	11090
support-server-api	Monitoring service that allows to work with metrics and desktops	11091
mkv-server-url-shortener	URL Shortening service	11092
mas-server-api	Back-end for the system administration module	11101
mas-server-settings	Settings service	11102
mpdn-secret-vault-api	Personal data storage service	11204
mfs-server-api	Service for working with photo files	11300
mfs-server-thumbnail	Service for working with thumbnails of file storage photos	11301
fs-server-api	File storage service	11302
mi-sender-telegram	Telegram messenger service	11404
mkv-server-admin	System user administration service	11500
mkv-server-api	Customer interaction service	11501
mkv-server-auth	Authorization server	11502
mkv-server-ws	Back-end for the application of working with the client via WebSocket	11503
mkv-welcome-api	Configuration service	11505
backup-client-server-api	Backup service	11506
logging-server-api	Logging service	11509
event-configuration-api	System event handler configuration service	11510
event-storage-server-api	System event handler service	11511
mkv-client-profiles-import	Profile import service	11514
mas-meta-server-api	Meta information service	11515
monitoring-server-api	Monitoring service	11517
statistics-server-api	Service for maintaining statistics on the operation of the system	11518
audit-server-api	Audit and logging service	11521

mkv-server-auth-ldap	Authorization service in the system via LDAP/AD	11522
mas-server-report	Reporting service for MAS	11553
mmpd	Service manager of detection processes	11600
modi-image-worker	Image processing service (crop/resize and etc.)	11700
modi-server-api	Discrete image processing service	11701
modi-ubda-tevian-[01-04]	Photo processing server	11710 y [01], 11711 y [02], 11712 y [03], 11713 y [04]
mrp-server-api	Data processing server	11800
mrp-matching-tevian-go	Maching service for the Tevian engine	11806
mrp-server-broker	Management service	11821
mrp-server-image-broker	Image distribution service for trackers	11822
ms-server-filecache	Service provides caching files	11900
mkv-scheduler-api	A service that implements work with scheduled tasks	11910
video-restreamer-server	Video relay service	40000 40001

One of the server requirements for installing the Id-Welcome Core software package is the absence on the server of the software specified in the table above and the presence of free ports indicated in the table.

3. REQUIREMENTS FOR CORRECT WORK

3.1. ID-WELCOME SERVER

Biometric facial information processing requires a significant amount of computing resources. The server characteristics directly depend on the amount of information processed by the System from the cameras. Approximate calculation for the most frequent values is presented in Table 2.

Table 2. Server requirements

Number of cameras	CPU (Core)	RAM (GB)	HDD (GB)	SSD (GB)
1	5	16	600	240
2	6	16	700	240
3	8	16	700	240
5	10	32	800	240
7	14	32	900	240
10	18	64	1000	240

Operating system: Windows 10 Pro (2004 and later, according to the end date of the operating system support), Windows Server 2016/2019 and later. If you have the “Windows 10 Pro N” OS edition installed, you have to additionally install the “Media Feature Pack” component. The account (login/password) (including for a remote user) must remain unchanged throughout the installation. The account (login/password) must allow upgrading privileges to Administrator if necessary.

The following components **must not** be pre-installed on the server:

- PostgreSQL
- RabbitMQ
- Redis
- Web server that uses ports 80 and 443

3.2. CAMERA INSTALLATION

- The camera must be fixed using the special bracket supplied to minimize the blurring caused by the movement of the camera. It is allowed to mount the camera on a tripod; the camera installation height is from 1.5 to 2 m.
- The recommended camera placement: a person looks at the camera and moves towards it or across the camera's line of sight.
- Screens, interactive kiosks, boards, banners should not block a person moving.
- For recognition and identification purposes, it is required to use cameras with varifocal lenses.
- The lens focal length must be in the range from 9 to 40 mm.
- The camera tilt at the end of the face detection area should be within 15 deg.
- The optimal camera height above the floor is 2.2 m, it is desirable that the beginning of the face detection area is located further than 8.0–8.5 m.
- If cameras are mounted indoors, uniform and constant level of illumination must be provided. For proper facial recognition, indirect lighting must provide such conditions, when visitors' faces have uniform illumination without shadows or glare. The recommended light intensity is about 300 Lux (minimum 150 Lux, maximum 600 Lux).
- At the beginning of the process of facial recognition, it is required to mount and configure a camera so that the size of an adult's face is about 160x160 pixels (the line of sight is more than 2 meters in width — a little wider than the width of outstretched arms).

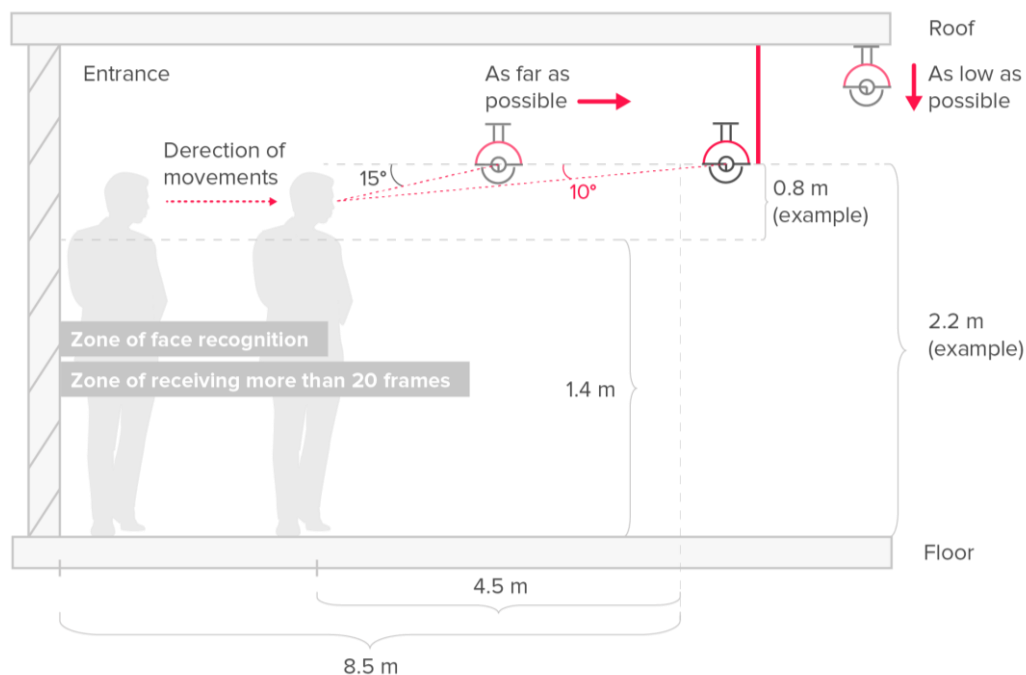


Figure 4. Camera placement recommendations

4. LANGUAGE SUPPORT

The Id-Welcome software is a multilingual solution that allows you to choose from the following language options:

- English (by default)
- Spanish

The list of available languages can be expanded upon request.

5. DOCUMENTATION LIST

- Id-Welcome Administrator Guide
- Id-Welcome Operator Guide

6. SOFTWARE MANUFACTURER

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