INTRODUCTION

MAX Call-Taking provides the solid reliability for which Zetron is known in an end-to-end IP, Next-Generation 9-1-1 telecommunications system. One of Zetron's MAX Solutions family of products, MAX Call-Taking offers a full range of features and functionality that are important to 9-1-1 centers. It also employs the latest standards-based IP protocols and IT best practices to offer the highest levels of scalability, usability, adaptability and availability. The MAX Call-Taking system's intelligent user interface (UI) is expressly designed to streamline and simplify operators' tasks, reduce distractions and fatigue, and improve operator efficiency. The UI is designed to meet National Emergency Number Association (NENA) human machine interface (HMI) requirements (NENA 54-750). MAX Call-Taking is designed to evolve to meet NENA standards as they are finalized.

FEATURES AND FUNCTIONALITY

MAX Call-Taking offers the following key features and functionality:

Intelligent user interface (UI)
- Selective display of information pertinent to the task allows operators to focus on the incident at hand. Reduces information overload.
- "One-click" operation for common tasks improves response times and reduces operator fatigue.
- Information can be tracked, augmented, and passed on as necessary to other dispatchers or call participants.
- An integrated map allows location display within the call window, providing visual location of wireless callers and location tracking.

- Integrated Standard Operating Procedures storage and display.
- Laptop mode support using a USB headset.
- Designed with i3 in mind and ready for support of future requirements.

Automatic Call Recovery (ACR)
- Zetron's patent-pending design provides a resilient call connection even if network anomalies occur.
- If an outage or human error occurs, the ACR service helps ensure there is no impact on ongoing or newly arriving calls. For example, if a Call Server is mistakenly taken out of service, any calls active on the server are recovered and reassigned to another Call Server in the system. This occurs seamlessly, undetected by the parties in the affected calls. Any conference calls impacted are also recovered.

Automatic Call Distribution (ACD)
- Provides advanced, flexible call routing for single or multiple PSAPs.
- Support of geographically diverse sites.
- Supports auto answer call distribution, queue prioritization, ring groups and ring all.
- Can incorporate an interactive voice response (IVR) solution with DTMF entry.
- Configurable call policies to ensure effective and efficient call disposition.
- Allows queue assignments to be configured to accommodate predicted call volumes.
- Supports multiple direct-inward dial (DID) and dialed-number identification service (DNIS).
- Provides advanced dedicated queues for special call types.

MAX Call-Taking

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Next-Generation 9-1-1 capabilities

- SIP-based and ready to meet existing and emerging NENA NG9-1-1 i3 functional and interface standards.
- Compatible with Emergency Services IP Networks (ESInets).
- Supports hosted solutions and "virtual PSAPs."
- Supports the use of softphones and SIP phones.

High reliability and cost-effective scalability

- Able to meet the needs of a single PSAP or multiple PSAPs in a regional or statewide deployment. Reliability increases even more as a system is scaled up and additional servers are added.

Low power consumption

- Core Call-Taking Servers consume approximately one-tenth the power of comparable servers, which reduces heat and operating costs.

Digital, end-to-end IP

- When MAX Call-Taking is deployed in a high-grade IP infrastructure, its self-healing protocols and redundant architecture provide high availability.

Utilizes standards-based IP protocols

- This ensures the system's compatibility with commercial, off-the-shelf (COTS) IP network devices.

Remote access and maintenance

- Allows system to be monitored and maintained remotely. All electronic functions that can be performed locally can be performed remotely.

PSAP Reports

- Used for periodic review of key metrics, statistical data analysis, quality assurance and report creation.
- Multiple PSAP CDR support.

SYSTEM OVERVIEW

The basic MAX Call-Taking system consists of:

- Windows-based workstation and console software.
- Session Initiation Protocol (SIP) telephones and related devices.
- High-availability, low-power servers that use a fault-tolerant architecture to control, monitor, and log call traffic.

MAX Call-Taking System Overview
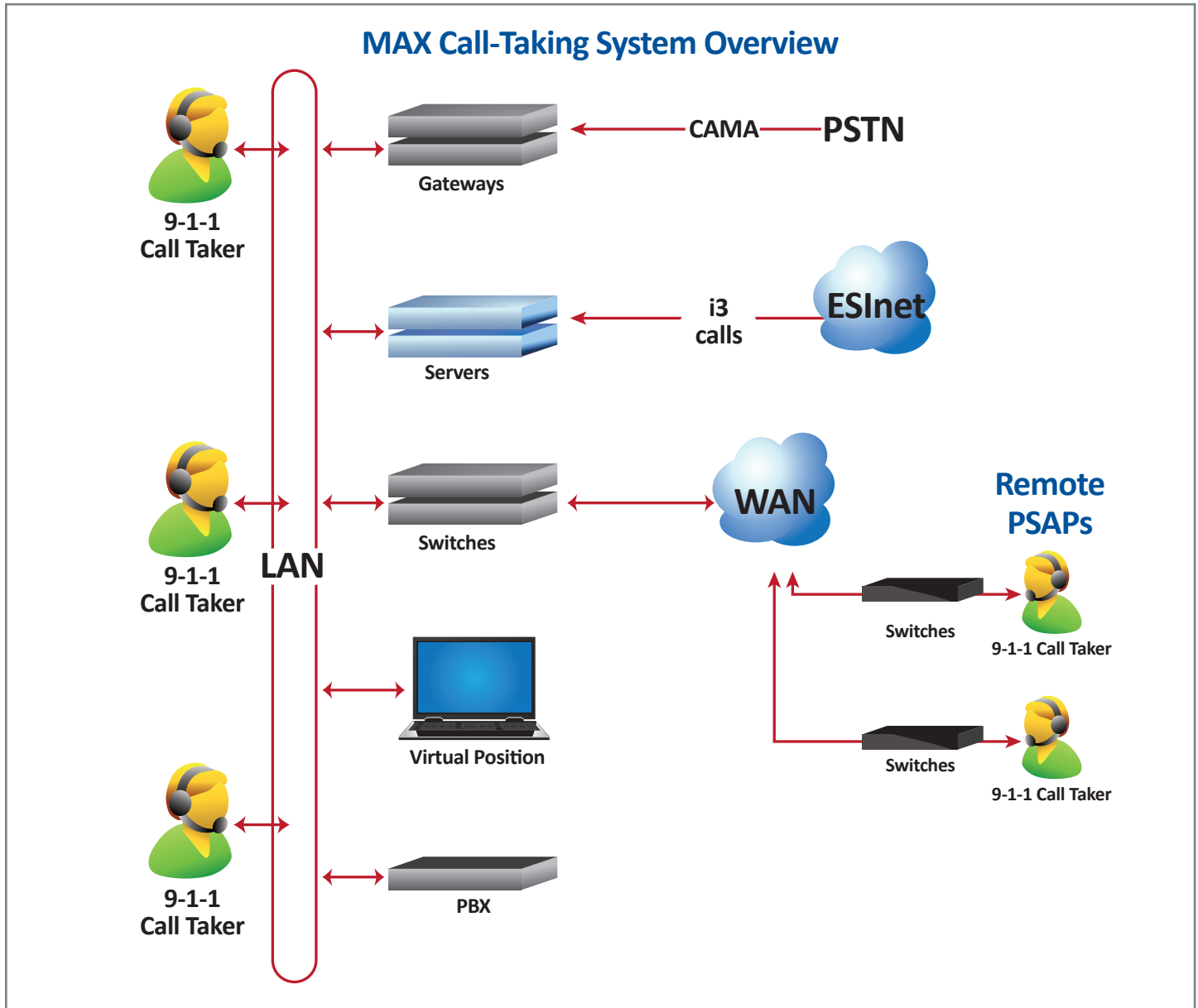
- Native SIP and i3 support and gateways that accommodate a variety of legacy telephony protocols (CAMA, FXO, PRI).
- High-availability network switches that provide fast, secure, optimized support for unified data, voice, messaging and video communications.
- Optional full-featured PBX.
- NENA-compliant CAD and logging recorder.
- Redundant, high-efficiency power supplies.
- Integrated Event Replay that allows call-takers to replay past call information.
- Redundant network design.

SYSTEM COMPONENTS

The main components of the MAX Call-Taking System are: the **MAX Call-Taking Servers**, the MAX fault-tolerant network (which consists of **MAX Call-Taking Switches**), the **MAX Call-Taking Telephony Gateways** and the **MAX Call-Taking Consoles**.

MAX Call-Taking Servers

The MAX Call-Taking Servers are unique, compact, high-performance computers that are the heart of the MAX Call-Taking system. They are also the key components that support the MAX Call-Taking system architecture. The servers utilize solid-state drives (SSDs) as part of the fault-tolerant framework and provide increased reliability as the system is scaled upward for growth. The servers also offer high mean-time-between-failure (MTBF). In addition, the servers' ultra-low power and lower operating temperatures significantly reduce operational costs and contribute to their high MTBF.

The MAX Call-Taking Servers perform the following tasks:

- Support the location-to-service translations (LoST) server required for NG9-1-1
- Provide information about line status to the positions.
- Maintain call-data records.
- Allow privileged users to perform system configuration and general system maintenance, including VPN and other remote-access operations.
- Provide system management services that constantly monitor for faults or performance degradations and take corrective actions when necessary.
- Patent-pending Automatic Call Recovery maintains the audio connection even when temporary network interruptions would otherwise disconnect callers.

MAX Call-Taking Switches

The MAX Call-Taking Switches provide a fault-tolerant network that routes all call-taking traffic and data within the system. The switches also provide port-by-port control of Quality of Service (QoS) and security for the system.

MAX Call-Taking Telephony Gateways

The MAX Call-Taking Gateways accommodate a wide array of telephony protocols and systems, including CAMA, PRI, FXO, and SS7.

MAX Call-Taking Consoles

The MAX Call-Taking Consoles consist of software running on Windows 7-based PCs. The software makes possible one of the MAX Call-Taking system's most unique and important features, its intuitive user interface (UI). The UI selectively displays information to the console operator that is most pertinent to a given activity or task. This helps the operator remain focused on the immediate incident or job function. It also makes it easy for the console operator to contact a group or person rather than requiring the operator to know which specific system resource or circuit is needed to make that contact. This improves the operator's ability to respond quickly, effectively and efficiently to incidents.

SPECIFICATIONS

STANDARD SYSTEM CAPACITY
24 Positions with secondary phones
48 Admininistrative lines
8 Hosted sites
Contact the Zetron Sales Department for larger systems

MAX CALL-TAKING CONSOLE WORKSTATION

Operating System:	Windows 7 x 64 Professional.
Video Monitor(s):	1920 x 1080 required. DirectX 10-compatible graphics processor with a Windows Display Drive Model (WDDM) 1.1 driver, pixel shader 3.0 in hardware, and a minimum of 1GB of video RAM.
Processor:	Dual Core i3/i5 3.0 GHz or better processor.
Memory:	8GB.
Drive:	80GB or larger.
Network:	100/1000 Ethernet Connection.

ADMINISTRATIVE AND EMERGENCY LINE INTERFACE

Analog:	RJ-21, FXO 2-wire loopstart, ring and tone detection, disconnect supervision, Caller ID detection
Digital T1:	RJ-48c, CAS Robbed bit loop and ground start, E&M, immediate, wink, double wink
Digital PRI:	RJ-48c, ISDN DSS-1, NI-2, Q.SIG
	E9-1-1 Trunk: RJ-21, 2-wire, reverse battery, 900 ohm, accepting MF (R1) signaling, Direct CO, Tandem CO, Enhanced MF
i3:	Call for more information.

SECONDARY AND ADMINISTRATIVE PHONE
IETF SIP (RFC3261) and associated RFC's

ALI INTERFACE
NENA Compliant EIA RS232 to IP interface

CAD INTERFACE
NENA Compliant EIA RS232 to IP interface

SPECIFICATIONS

MAP INTERFACE

Integrated Map: Supports ESRI map version 10 or above for mapping of X/Y coordinates

External Map: NENA Compliant EIA RS232 output

CDR PRINTER INTERFACE

EIA RS232 to IP interface

TDD/TTY COMMUNICATIONS

5-bit Baudot at 45.45 baud

MASTER CLOCK

NTP server over IP required

AUDIO LOGGING

Analog console output available

Analog and digital line recording available

EXTERNAL ALARMS

Light tree interface for visual notification of alarms

Auxiliary I/O outputs for monitoring or notification of alarms

SMTP notification

TELEPHONE RADIO HEADSET INTERFACE (TRHI)

Support of Zetron's TRHI for interfacing a radio dispatch console

NETWORK REQUIREMENTS

Console Workstation

Payload: 175 kbps maximum for each audio traffic channel; Tx or Rx; 5 kbps average for non-audio traffic.

Packet Loss: < 0.1% (< 1% for non-mission critical).

Packet Delay: < 40 ms for LAN environments; up to 2 seconds for longhaul (long delay) environments.

Packet Jitter: < 20 ms (< 40 ms for-non mission critical).

Network Infrastructure: 100 Mbps minimum, full-duplex Ethernet. This mission-critical application is intended for use with a dedicated network. The highest levels of availability require fault-tolerant network components certified to work with the MAX Call-Taking system.

ENVIRONMENTAL

Operating Temp.: 0 to 40C (32 to 104F)

Operating Humidity: 5-80%, non-condensing

STANDARD SYSTEM SIZE

Network Switches (2): 1 U (1.75") H, 19" W, 15" D, 10 lbs

Cable Manager 1 U (1.75") H, 19" W, 8.6" D, 2 lbs

Server Rack 6 U (10.5") H, 19" W, 8.5" D, 25.6 lbs

Fuse Panel 1 U (1.75") H, 19" W, 2.5" D, 1.5 lbs

Power Supply 3 U (5.25") H, 19" W, 8" D, 14.1 lbs

Power Strips(2) 1 U (1.75") H, 19" W, 4.5" D, 4.6 lbs

Telco Gateways* 1 U (1.75") H, 19" W, 12" D, 9 lbs

* Quantity of telco gateways varies depending on needs

POWER

100-240 VAC (50/60Hz), 285W dissipation

COMPLIANCE

EMC Compliance Standards: FCC Part 15- Radiated & Conducted Emmisions (USA)

ICES-003- Radiated and Conducted Emmisions (Canada)

EN 55022 Radiated & Conducted Emmissions (Europe)

EN 5024- Immunity (Europe)

Telecommunications Compliance Standards: FCC Part 68 (USA)

CS-03 (Canada)

Regulatory Compliance Markings: FCC Part 15 (USA)

FCC Part 68 (USA)

CS-03 (Canada)

CE (Europe)

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