New Trends in Logging: Linux, Layering and System Architecture
by Tony Procops, General Manager, ASC America

In the last six months, many exciting, new changes in the call-logging sector are yielding more powerful, flexible, secure and reliable systems.

If you are in the market for a new call-recording solution, you must first evaluate its operating system, the core component and engine for any solution. The operating system provides the intelligence and backbone for building all system functionality.

Linux is quickly becoming the new industry standard to create a reliable and secure operating environment. Its enhanced functionality, adaptability and robustness have made it the non-proprietary alternative to other operating systems being used today.

Linux's powerful, “open-source” software allows it to be modified and customized by the manufacturers to meet the requirements of a mission-critical, communications recording system. As market requirements become more stringent, the manufacturer can continue to improve the product through an ongoing update process not possible on other popular operating systems. Thus, the product's shelf life is prolonged, and replacement costs are reduced.

Linux thoroughly satisfies the demands of mission-critical applications for reliability because its solutions have been reviewed, continually developed and improved. Additionally, it provides a stable, multi-user, multi-tasking platform. Linux is optimized to work with SQL databases, especially with MySQL, a powerful database for streamlining the call-retrieval process while managing over 20 million call records. In fact, these systems track over 30,000 calls per hour, more than the most active dispatch applications in the world.

Linux’s outstanding user administration also makes it the most secure of all the popular systems available today. The Administrator, equipped with all rights, is called the “root user,” and other user access rights may be defined with different limitations. All applications are restricted from accessing the operating system, and it is not susceptible to hacking or the increasingly devastating Windows viruses. The Linux-based recording solution provides its own built-in firewall to block attacks and can be programmed to allow only approved traffic into or out of the system.

In most hectic dispatch environments, when finding and replaying a call could mean the difference between life and death, this powerful system really performs. It maximizes the inherent capabilities of the hardware and is compatible with many different platforms and general-interest desktop applications including web browsers, email programs and file managers. Its advanced, graphical user interface and responsiveness during a power failure provide further evidence of performance superiority. Upon power restoration, the system boots up instantly and is operational in less than a minute, with no annoying, time-consuming check-disc procedures.

Today's Linux-based communications recording systems avoid technology obsolescence by building their applications with a layered software approach. This approach allows facilities to purchase only the modules they require, “a-la-carte,” if you wish; and the optional layers may be adapted to accommodate or leverage a company's existing hardware or network infrastructure.

To provide a unique disaster-recovery environment, calls from the recorder may be archived and sent to a customer-provided server installed at another location. For smaller departments, the systems may be purchased in a stand-alone, “all-in-one” configuration, totally self-contained in one chassis. The recorder houses the database, a hard drive for local storage and other drives for archival purposes.

For larger departments, PSAPs or countywide applications, the enterprise configuration may be more sophisticated. Calls may be recorded, stored on the hard drive for the interim and then transferred to a customer-provided, off-the-shelf storage device, where the calls may be stored indefinitely before being archived.

Using the interaction layer of the software, these flexible, “state-of-the-art” systems are easily connected and interface with digital phones, 911 trunks, trunked radio, Voice over IP and CAD. The products run on a single

stand-alone computer or, for larger countywide applications, distributed solutions may be installed, with the recording/ interaction layer at each department but storage, archiving and access from a central location. Many of these systems scale from eight to hundreds of channels per unit with the ability to network in the thousands.

Larger hard drives eliminate the need to play back calls from the archive media and provide more online storage, one of the most important trends in public safety today. Online storage provides quicker access to calls and expedites the resolution of disputes. When calls must be stored for extended periods of time, recorders may be attached to Storage Area Networks (SAN) and Hierarchical Storage Management (HSM) devices, theoretically providing unlimited online storage. Additionally, advanced compression rates are further increasing the number of calls stored on the standard hard drive. The best compression available today, without compromising the sound quality, is 4.8:1, enabling storage of 50,000 hours on a 120 GB drive.

The system's gateway layer connects the recorder to hardware and software applications to send recorded data to a central location from satellite sites. To assist with the search and replay, and to leverage the data provided in many dispatch systems, an Application Programming Interface (API) integrates the data into a call-recording database for later use with additional search criteria.

To further improve the reliability of the call-recording system, redundant hard drives use a dual controller. This redundancy allows 100 percent functionality, even in the event of a drive failure. To increase the reliability of the power source, a redundant, hot-swap, dual-input, load-sharing power supply may be added with industrial (versus low-end) PC components. With the move to open, more off-the-shelf devices, you must carefully examine the mean time before failure (MTBF) of the total solution. The system chassis and all the units must be maximized for a recording system and tested in a stringent environment, critical for public-safety applications. In the event of a database error, the best systems reconstruct the data from the archive media.

In yet another new trend and benchmark for the industry, the built-in remote service dispatch facilities now remotely control the system via a secure LAN/WAN connection with no additional third-party software. Other client applications are becoming as powerful as the system architecture itself:

1) Accessing calls remotely via a web browser allows users access to the system data and calls from any secure PC in the world with a valid user id and password;

2) Graphic user interfaces (GUIs) are more user-friendly and require minimal training;

3) Powerful LAN/ WAN clients provide features unavailable through a browser interface such as multi-channel replay and live monitoring to synchronize the playback from radio and telephone channels, critical for recreating the events of an incident; and

4) Dispatchers may instantly review current or previous calls with the touch of a button without the need for a separate call-check type device.

All these features, combined with the latest trends in layering and system architecture, interact with a new synergy in a Linux operating environment. They create a more powerful, reliable and secure solution and offer a very easy upgrade path from your current system with virtually no learning curve.

Tony Procops, General Manager of ASC telecom, oversees their North American operations. A leading provider of integrated communications recording and quality-monitoring solutions for public-safety organizations, ASC has nearly 40 years experience in the communications industry, and over 20,000 installations in more than 60 countries. For more information, email tprocops@ascamerica.com, write ASC telecom, 4 Gannett Drive, #100A, White Plains, NY 10604; call 914-644-6444; or visit www.asctelecom.com.