Real-time analytics are a required component for situational awareness at the tactical edge. Real-time signal identification, using digital techniques and deep learning at the edge, along with the ability to re-train the neural network for new signals/anomalies is a capability not normally associated with Edge applications.

The powerful HPE Edgeline EL8000 Converged Edge System, which provides Enterprise class computing, security and manageability, is optimized for Size, Weight, and Power (SWaP). The HPE Edgeline EL8000 Converged Edge System enables the processing of vast amounts of data in real time directly at the edge, based on open
standards to boost flexibility and reduce costs. Now, it is possible to deploy a new neural network with newly identified user-specific capabilities in the field—without having to return to the datacenter.

**Adding complexity: cyber adversaries**

The wireless communications domain is a complex world with thousands of signals—generated by both good and bad players. There is a constant need for monitoring the wireless world, for both confirming known good signals and being able to detect anomalous signals/rogue waveforms. Any wireless interface—from Wi-Fi access points, to a smartphone’s Bluetooth® interface, or even from wireless security camera backhaul connections—is a potential attack vector for cyber adversaries.

Many traditional wireless detection systems are unable to monitor a wide number of spectrums. While looking for many different types of signals simultaneously, they tend to focus on certain common signals such as Wi-Fi or Bluetooth. The more advanced and flexible wireless monitoring systems that monitor many different signals simultaneously require a significant amount of time to perform the scanning and identification of signals of interest, on the order of tens of minutes. Both traditional and more advanced systems also lack the capability to learn their own standard environment, resulting in generalized solutions that don’t truly meet the needs of the user.

**Leveraging artificial intelligence at the edge**

Artificial intelligence (AI) computing at the edge solves problems for both the commercial wireless world in addition to supporting defense applications worldwide. This solution is centered around near real-time signal identification on a SWaP-optimized Edgeline EL8000. AI computing at the edge means utilizing deep learning neural networks and GPU-accelerated computing on an enterprise platform that is easily deployable and field ready.

With HPE Edgeline Converged Edge Systems and NVIDIA® Tesla® GPUs, combined with AI-enabled signal detection software OmniSIG™ from HPE partner DeepSig™, it is now possible to push neural network-enabled wireless signal detection to the edge, creating a next-generation platform for monitoring a wide amount of wireless frequencies for a large number of signals. With OmniSIG, the entire wireless environment can be learned and constantly monitored within seconds (if not milliseconds). Existing systems that do not leverage AI require tens of minutes to perform full end-to-end scans, resulting in a potential loss of operation if jammed or poor signal quality if being over-run by a rogue signal.

Leveraging state-of-the-art AI techniques and high-performance hardware translates to continuous confirmation of wireless signals and alerting for wireless signals that are not approved. The OmniSIG SDK enables re-training of the neural network with ease—even in the field. This technology minimizes potential lag time between updated and trained models (i.e., updating the neural network). Traditional systems are limited to specific release cycles determined by the vendor. With the OmniSIG SDK, the bar is significantly lowered for training an AI neural network, and the user is dictating the release cycle for updates, not the vendor or software development team. Instead of waiting weeks for software updates to flow back to the edge, training new signals of interest into the product range can now be accomplished in one to four hours using HPE Edgeline Converged Edge Systems with NVIDIA GPUs.
HPE Edgeline EL8000 Converged Edge System: Product Overview

Overview and Key Features
HPE Edgeline EL8000 Converged Edge System is a unique general purpose compute platform, designed to provide the highest compute power in harsh conditions of edge locations.

- **Ultra-compact and dense form factor**, perfectly suited for space and power constrained environments
- **Uncompromised performance** with top line Intel® Xeon® Scalable processors
- **Rugged and enhanced environmental specifications**, going above and beyond industry toughest standards (including MIL STD)
- **Modularity and flexibility** to provide right compute resources for diverse mix of workloads at the edge
- **Manageability and security** enabled by HPE state-of-art iLO5 technology, crucial for production grade edge infrastructure deployment and operation from day zero

The perfect combination
The full hardware and software stack solution can be used to build a system for wireless signal detection at the edge. The HPE Edgeline Converged Edge System including NVIDIA GPUs and OmniSig is able to detect and identify a variety of signals, including proprietary custom signals. The HPE Edgeline EL8000 Converged Edge System and its differentiated footprint has the ability to support all kinds of enterprise workloads at the edge, including artificial intelligence and deep learning.

HPE Edgeline EL8000 chassis technical specifications

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>8.63&quot;(SU) height x 8.7&quot; width x 16.91&quot; depth (two chassis side-by-side fit into standard 19 or 23 inches rack)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>45lb (single 5U chassis, equipped with equipped with 2x2U cartridges, not including PCIe cards)</td>
</tr>
<tr>
<td>Cooling</td>
<td>Front-to-back, back-to-front reversible airflow</td>
</tr>
<tr>
<td>Power supply</td>
<td>• 1+1 redundant PSU, 1500W each, -36-72VDC or 95-265VAC</td>
</tr>
<tr>
<td></td>
<td>• 400W maximum power envelope per each 1U in the chassis</td>
</tr>
<tr>
<td>Environment specification*</td>
<td>Continuous operation 0 – 55C, Storage -40 – 70C, 8 to 90% operational humidity non-condensing; 5 to 95% non-operating humidity non-condensing</td>
</tr>
<tr>
<td>Management and security</td>
<td>Chassis level: built-in dedicated silicon for out of band management for common chassis elements and optional aggregated management of individual cartridges, full RedFish compliance</td>
</tr>
<tr>
<td></td>
<td>Cartridge level: individual iLO5 chips on board of each cartridge, full RedFish compliance, chassis provides isolated network for aggregating out-of-band management from cartridges to single physical port off the chassis.</td>
</tr>
</tbody>
</table>

*Targeted by EL8000 design, environmental test results will be available at product general availability

Learn more at [www.hpe.com/edge](http://www.hpe.com/edge)