

# The HauteSpot Difference

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HauteSpot Networks Corporation builds wireless routers and bridges. We have divided our product line into two families: The HR-WRAP family of versatile 802.11 protocol routers and bridges; and the HR-IXP family of high performance routers and bridges which use our proprietary HauteLine wireless protocol. The two families have distinct roles to play in wireless communications, and each offers distinct advantages over competing options in the market.

## Common Features

All HauteSpot Networks products share important features such as:

- **Modularity** – all of our products are designed for flexibility through the use of modular design. While several manufacturers are just now copying HauteSpot Networks modular approach, we have been building modular wireless systems for over 4 years.
- **Extensibility** – because our products are modular, we go beyond just wireless to offer features such as video encoding, GPS reception, local attached storage (disk drives), sensors, and more.
- **Ruggedness** – our outdoor enclosures are compact and very durable. Our enclosures meet NEMA IP 6/7 design guidelines for waterproof operation (up to 2 feet under water).
- **Compactness** – our indoor products are extremely small and light weight
- **Rigorous Testing** – All of our products undergo extensive product testing by trained professional staff
- **Standards Compliance** – While we may have proprietary elements in our systems, we remain completely standards compliant at our end points, by supporting TCP/IP, RTP, UDP Multicast, and more.

## HR-WRAP Product Family

The HR-WRAP products are designed for network applications where the density (the number of nodes) is expected to be high, but where data rates are expected to be lower. The HR-WRAP family of products use the 802.11 contention protocol to provide point to multipoint, or point to point operation. This allows the HR-WRAP products to be used with virtually any 802.11a/b/g device, making them ideal for applications like Wireless ISP networks, hospitality networks, or surveillance networks with lower cost IP cameras running at lower resolution.

The HR-WRAP products are full feature routing/bridging platforms capable of acting as Access Points, Client Bridges, Client Routers, Repeaters, or Point to Point Bridges. They can support smaller mesh installations using WDS and Rapid Spanning Tree. And they can scale to larger mesh installations using OSPF routing over WDS links. They are extremely flexible and fully scriptable for configuration and management.

Their major limitation is that their aggregate TCP/IP forwarding rate is limited to less than 30Mbps. This means that if you have a wireless interface and a wired interface, they can forward 15Mbps between the interfaces. Also, because they use the 802.11 contention based protocol, even in point to point operation, they have much higher levels of delay variation and resulting jitter for applications like high definition video streaming than the HR-IXP products which use the HauteLine protocol.

### *HR-WRAP product family advantages:*

- The HR-WRAP family is field tested with several thousand units having been sold over several years and having a very low failure rate (< 0.5%).

- The HR-WRAP family is extremely flexible, offering features and functions of competing solutions costing several times more.
- The HR-WRAP family is fully supported with a trained technical staff and manufacturer's warranty that is first rate.
- The HR-WRAP family is being constantly incrementally improved with new software releases.
- The HR-WRAP is fully standards based and interoperable with other 802.11 products. HauteSpot Networks conducts extensive interoperability testing with third party products to validate this.

## HR-IXP Product Family

The HR-IXP products are designed for network applications where the density (the number of nodes) is less, but the level of network performance required is much higher. Applications such as high definition video production, multi mega pixel video surveillance, real time data streaming, SCADA (Supervisory Control And Data Acquisition), and VoIP trunking all require extremely fast data rates, low delay variation, and reliability. The HR-IXP family is designed specifically to meet the needs of these types of applications.

The HR-IXP family supports the HauteLine protocol (patent pending) which is a wireless OFDM protocol specifically designed for point to point Ethernet streaming.

- The HauteLine protocol creates a dedicated RF link between two HR-IXP end points. A full RF channel is allocated to the link.
- All management is handled in the header of RF frames, rather than in dedicated management frames as in 802.11 or 802.16. No interruptions to a stream are introduced by activity like polling, beaconing, acknowledgements, or non-acknowledgements.
- Unlike COFDM microwave solutions, the HauteLine protocol is bi-directional and back stream traffic is managed under QoS rules to assure no interruption to upstream traffic. While designed for highly asynchronous traffic like Video over IP streaming, the HauteLine protocol can be used for any Ethernet bridging. This allows in band control for applications like camera control, digital encoding dynamic rate adaptation and more.
- The HauteLine protocol support UDP Multicast streaming to more efficiently support wireless bandwidth and support point to multipoint broadcasting.

The HR-IXP family supports the HauteLine protocol with leading edge network and application processing hardware. Unlike competing solutions which use low cost MIPS processors, HauteSpot Networks uses high performance Strong ARM IXP processors from Intel which are designed for aggregate TCP/IP forwarding rates of over 200Mbps, more the 7 times the performance of our HR-WRAP family and 10 times of the performance of most competing wireless bridges in this price range.

Our purpose built HauteRoute OS is designed for simplicity of use. For a point to point bridge link the only configuration required is to set the addresses of the two units and align the antennas. The HauteRoute OS abstracts all of the complexity of configuration. Radio modules are automatically detected and configured. We even offer network discovery, where one HR-IXP unit can detect the presence of another unit on the same network and provide the remote units configuration information.

HR-IXP family point to multipoint configurations are possible using our HR-IXPDX dual radio system as a base station and defining virtual interfaces for each remote radio. However, most demanding applications require a dedicated RF channel. Transitions to and from 802.11 networks can also be created using the HR-IXPDX, with the HauteLine protocol links used for backhaul.

### ***HR-IXP product family competitive advantages:***

- The HR-IXP family supports actual TCP/IP forwarding rates of up to 68Mbps over HauteLine wireless links.
- The HR-IXP family supports up to 200Mbps of aggregate TCP/IP throughput. This means that two wireless interfaces can be run at full rate, forwarding to a wired Ethernet port with no bottleneck.
- The HR-IXP family uses the HauteLine wireless protocol which delivers low delay variation and jitter. This means no buffering is required, reducing overall network latency for real time applications.
- The HauteLine protocol supports UDP Multicast, allowing for point to multipoint streaming data distribution over wireless links for applications such as electronic signage, event production, and IPTV distribution.
- The HR-IXP family is highly secure. The HauteLine protocol is not detectable by standard 802.11 sniffers. The HR-IXPDX product supports AES 256bit encryption for highly secure links.
- The HR-IXP family has a very simple to use browser based interface.
- The outdoor models of the HR-IXP family support audible alignment, with a high pitch tone indicating signal strength for antenna alignment. This is unique in the industry.
- The modular design of the HR-IXP family has allowed introduction of innovative products such as our HR-IXPSXPI-SD which combines MPEG2 video encoding, UDP Multicast streaming and wireless bridging in one unit.
- Our modular radio design allows for rapid deployment of new RF frequencies for government, military, and licensed commercial operation. We already support frequencies in the 1.7GHz, 2.5GHz, 3.3GHz, 3.4GHz, 3.6GHz, 4.4GHz, and 4.8GHz, as well as unlicensed and public safety frequencies.
- Our high gain transmitters and high sensitivity receivers are leading edge.
- All of our indoor HR-IXP and our HR-IXPSXPs outdoor model support Serial over IP for remote control and industrial automation functions.
- Our HR-IXPSXPs supports transmit and receive antenna diversity which greatly improves mobile application reliability.
- The HR-IXPDX dual radio system can be configured for Spectrum Diversity Link Aggregation (patent pending) which allows for two radios to be bonded together into one virtual interface that is more immune to interference and is more fault tolerant, since it uses two distinct RF frequencies on separate bands, rather than just one frequency.
- The HR-IXP product line is tested for interoperability with a number of multi mega pixel surveillance cameras and HD broadcast production quality video encoders.
- The HR-IXPWIND products incorporate environmental sensors such as temperature, wind speed, wind direction and barometric pressure.

But the most important HauteSpot difference is our people. We design, build and support our products with highly trained, responsive staff. We select our resellers and distributors for their industry knowledge and work to constantly develop their knowledge of our products. Our web site offers product support resources second to none. Our products are designed in USA, built in USA and used by a number of US governmental agencies. We stand behind our products, our resellers and distributors, and most important, our customers.