



# Benefits of Distributed Architecture

Contributors:

Arindam Roy - Director, Product Management, Systems

Larry Emmett - Principal Software Engineer

Earlier this quarter, EFJohnson Technologies announced the launch of its ATLAS™ P25 Systems Solution. This launch was a key milestone for both EFJohnson and the LMR P25 community, as it highlighted the benefits of using a distributed architecture to deliver reliable, flexible, and scalable P25 infrastructure solutions to our customers.

The ATLAS solution uses an IP-based, fully distributed architecture allowing it to easily scale from a single site to a state-wide network. In addition, the fully distributed architecture eliminates the need for a central controller, which significantly increases system reliability, decreases cost, and ensures our customers are able to successfully execute their mission-critical tasks.

## Traditional Centralized Architecture vs. Distributed Architecture

The traditional LMR system architecture has been based on a centralized architectural model where all user communication and control traffic is directed to a central point in the network. In this architecture, a central system controller and optional redundant system controller provides the call control, mobility management, and traffic management functionalities. Duplication of the centralized system controller is normally the method to ensure reliability. However, the controller is typically the most costly component in the system deployment and an additional system controller further increases the cost. In addition to the escalated cost, this approach is not a foolproof solution since network outages that eliminate the link to the controllers can still bring the system down.

ATLAS, EFJohnson's patented distributed system provides additional reliability in a cost-effective manner by eliminating the need for an expensive central controller. This architectural approach distributes call control, mobility management, and traffic management across the entire network which allows each deployed site of the network to perform these functions independently. In fact, every site on the system is fully capable of providing all call control, mobility management, and traffic management services that the centralized architecture provides with costly centralized system controllers.

EFJohnson's unique method of distributing the subscriber and talkgroup mobility information among all components means the failure of single or multiple network components does not affect the operation of the rest of the system.

In addition to distributing control and mobility management, ATLAS also disseminates the traffic load. The patented ATLAS peer-to-peer approach does not require all voice traffic to traverse through the central controller, which reduces the bandwidth requirements at the core of the network. This also

means that when sites are added, bandwidth to connect the sites must be provisioned but existing backhaul connections are unlikely to require upgrades.

And lastly, the ability to distribute the intelligence of the system means that a hybrid system (trunked and conventional sites operating with near-trunked capabilities) can be built even if a hybrid deployment was not in the original plans. This affords customers flexibility in deploying a mix of trunked and conventional sites across the system in a hybrid fashion while retaining the ability for subscribers to roam, manage talkgroup mobility, and maintain seamless communication within the entire system.

## The Benefits of Distributed Architecture

The ATLAS distributed architecture addresses a variety of deployment scenarios such as Greenfield (new) deployment, network migration from proprietary technologies, or evolution from an analog to a digital P25 network. This provides several benefits as identified below.

### 1. Expandability (multi-site, multiple system types, multi-channel)

- Ability to start small then add more equipment to expand as needed
- When upgrading, purchases can be spread out to match budget cycle (rather than having to purchase expensive central controllers up-front)
- System is cost-effective initially and remains cost-effective as the system grows; there is no big switch to buy up-front
- Dynamic discovery allows easier addition of new system equipment without affecting the operation of current equipment
- Utilizing system gateways enables reuse of existing equipment and interoperability with the current system, allowing easier migration
- Future-proof the investment - expand the system without completely replacing it
- Flexible expansion – add trunking sites to a conventional system without changing rest of the system

### 2. Scalability (network & site capacity)

- Distributed control allows customers to increase capacity by adding sites, not expanding the central switch
- With distributed traffic management there is no additional bandwidth requirement for existing sites as new sites are added, ensuring minimal impact as system capacity grows

### 3. Reliability and Resilience

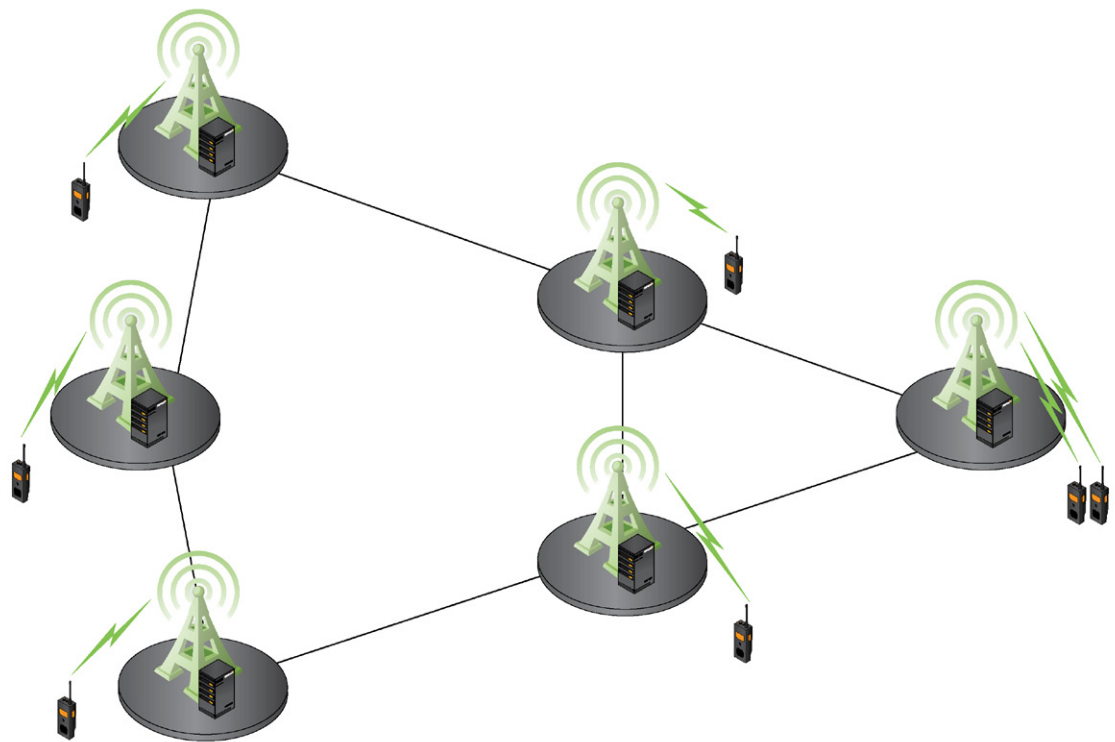
- Use of a distributed architecture provides multiple levels of redundancy as each site is capable of performing wide area system functions
- The ATLAS P25 solution goes beyond eliminating single points of failure by providing a fully distributed and fully redundant system at no additional cost
- In the event of a natural disaster, the ATLAS solution can continue to provide full wide area functionality between connected system components when parts of the network are down due to lack of network connectivity
- Uses patented auto discovery mechanisms to self-heal as network connections are reestablished without manual intervention

EFJohnson's patented distributed system architecture provides unparalleled expandability, scalability, reliability, and resilience that is difficult to duplicate using a traditional centralized architecture. The ATLAS P25 Systems Solution is designed to provide customers the most flexibility and lowest cost of ownership in the industry.

Learn more about our patented systems solution and how the distributed architecture can help you get more out of your existing or new LMR network:

[ATLAS P25 Systems Solutions](#)  
[ATLAS P25 Systems Products](#)

Please contact Mark Wood at [mwood@efjohnson.com](mailto:mwood@efjohnson.com) or 972.365.3271 for further information on the ATLAS P25 Systems Solution.



*Distributed Architecture Model*