Buffer at the Edge

Attributes	Description
Type	New
Industry Sector	IoT
Business driver	There is currently no global specification for broad IoT interoperability, independent of the physical radio. A DQ firmware upgrade would introduce a universal lower MAC, allowing for synchronous and asynchronous flows to share the channel. DQ in place of ALOHA has also proven a seamless migration path for legacy devices. Eliminating the ALOHA problem is also the key to stable QoS under any condition, and will make possible regional mesh networks as distributed public utilities for broadband and the IoT.
Business use cases	1. Automotive 2. Industrial IoT 3. Smart City 4. Wireless Optical Mesh 5. Eliminate backhaul or aggregation bottlenecks 6. Save power by half 7. Fix security by eliminating the middle hardware buffer
Business Cost - Initial Build Cost Target Objective	There is no additional cost for utilizing a Distributed Queue (DQ) collision detection scheme, as it is a direct replacement or swap with Aloha-based technologies including Ethernet or any other IEEE 802.x.x and requiring no change at OSI layers 2.5 or above. 50% energy savings in the PHY since retransmission of payload data is eliminated. Experimental Zigbee and LoRa base stations (RasPi and a radio hat) were built for $85 at Bucknell, improving the number of competing devices from 1500 to 5700 and concluding that crowdsourced regional mesh networks where hotspots link directly with each other for a network that gets stronger as it gets larger.
Business Cost – Target Operational Objective	The target operational objective is to achieve >95% throughput at all times, or Near-Perfect packet efficiency in a star network. Some efficiency will be lost in the hybrid DQ model to afford a commercial migration path for legacy devices which have no knowledge of the novel MAC, but this will still shatter the Aloha-based 50% theoretical maximum.
Security need	Security is a function of packet efficiency. A broadcast Lower Layer 2 architecture for ensembles will open the IoT metaverse, including channel/state information cross layered among the various OSI layers. DQ also allows us to encrypt the whole packet at the MAC/Data Link layer including the packet header and subheader with new variable fields for 9 levels of priority queuing, format information. or other to be determined fields. See security discussion in the attached SAE Journal article.
Regulations	CPNI law is a better part of the Telecommunications Act of 1996 which should be upheld in shared-packet networks if it were only possible in ALOHA or CSMA networks like Ethernet. Also bearing consideration should be the restoration of telecommunications privacy laws which began at the US Postal Service before transferring to telecom sector under the FCC. Finally, a push toward broadcast media in the digital world should bolster media ethics laws that existed under old TV.
Other restrictions	Licensed RF is restricted. WiFi, and other unlicensed RF for the IoT including long range TV White Space airwaves are not. Therefore, future distributed public utilities should use TVWS for long range connectivity mixed with metro meshes. Another restriction is the long term decision for AT&T to reduce its copper footprint by half, when the Central Office could also get the DQ firmware upgrade for perfectly good copper to be useful, and reducing EMF pollution dramatically.
Additional details	The hexadecimal address list from the DQWA Appendix can be made available. At 60 pages, it was only left out to make the specification document more manageable.

Case Attributes	Description
Type	New
Blueprint Family - Proposed Name	Buffer at the Edge
Use Case	IoT
Blueprint proposed Name	Buffer at the Edge Blueprint Family: Swapping out Aloha-based MACs
Initial POD Cost (capex)	N/A
Scale & Type	Theoretically infinite
Applications	Massive IoT with stable QoS
Power Restrictions	Reduced by half bit for bit since payload data never suffers collisions.

Infrastructure orchestration	Host: •Any fine grain network hardware
SDN	N/A
Workload Type	N/A
Additional Details	N/A

Committer	Committer Company	Committer Contact Info	Committer Bio	Committer Picture	Self Nominate for PTL (Y/N)
Jonathan Gael	M2M Bell	jonathan@m2mbell.com	Gael looks forward to contributing the fully drawn specification for any engineer to build an interoperable DQ system.		N

Attributes	Description
Type	
Industry Sector	
Business driver	
Business use cases	
Business Cost - Initial Build Cost Target Objective	
Business Cost – Target Operational Objective	
Security need	
Other restrictions	
Additional details	

Case Attributes	Description
Type	New
Blueprint Family - Proposed Name	Buffer at the Edge
Use Case	IoT
Blueprint proposed Name	Buffer at the Edge Blueprint Family: Swapping out Aloha-based MACs
Initial POD Cost (capex)	N/A
Scale & Type	Theoretically infinite Layer 2 Broadcast, Multicast or Unicast
Applications	Massive IoT with stable QoS
Power Restrictions	Transmission energy is halved, bit for bit
Infrastructure orchestration	Host: •Any network hardware
SDN	N/A
Workload Type	N/A
Additional Details	N/A

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