Thunderbolt™ technology, co-development by Intel and Apple, is a transformational I/O protocol that significantly simplify the end-user experience by concurrently supporting data (PCI Express) and display (DisplayPort) connections over a single cable.

**THUNDERBOLT BENEFITS**
- Capture and edit multiple uncompressed video streams in real time.
- Edit and view video while simultaneously backing up your content over a single cable connection.
- Backup and restore 1TB of content in less than five minutes.
- Daisy chain data and displays to simplify your workflow.

**THUNDERBOLT 2 BENEFITS**
- Display raw 4K video and backup content at the same time.
- Transfer the total production quantity of a typical 4K TV drama in less than an hour.
- Faster digital content archiving and back up.

**THUNDERBOLT 3 BENEFITS**
- Connect to new high-speed protocols via mobile workstations.
- Transfer Rate: Up to 40Gb/s
- Transfer 4K movie in under 30 seconds
- Capture, ingest, edit and backup uncompressed footage at exciting new speeds
- Backwards compatible via legacy adapter

**Technical Specifications**

**Protocol**
- Thunderbolt™ 700MB/s max PCIe 2.0 x4
- Thunderbolt 2 1375MB/s max PCIe 2.0 x4
- Thunderbolt 3 2750MB/s max PCIe 3.0 x4

**Bitrate**
- Thunderbolt—10Gbps
  10Gb/s dedicated to Display, 10Gb/s dedicated to PCIe
- Thunderbolt 2—20Gbps
  (2) 10Gb/s bi-directional channels aggregated into a single 20Gb/s bidirectional channel
- Thunderbolt 3—40Gbps
  (2) 20Gb/s bi-directional channels aggregated into a single 40Gb/s bidirectional channel.

**Cabling**
- Same cable for Thunderbolt and Thunderbolt 2
- Optical—100m max distance
- Copper—3m max distance
- Thunderbolt 3 uses USB-C passive and active Thunderbolt cabling

**OS Support**
- macOS®
- Windows®

**Performance Specs**

**Compatibility**
- 20Gb/s Thunderbolt 2 technology is backwards compatible with Thunderbolt.
- 40Gb/s Thunderbolt 3 technology is backwards compatible with Thunderbolt 1 and 2

**Limitations**
- Performance will be bottlenecked for every device downstream of a previous generation. Thunderbolt technology-enabled device in the chain.
- Note: Legacy Thunderbolt technology-enabled devices should be connected at the end of the chain.
- Display traffic takes priority over PCIe traffic.

**4K Workflow**
- Thunderbolt 3 supports uncompromised 4K workflows.
- Thunderbolt 2 supports 4K output via one Thunderbolt connector.
- Thunderbolt supports 4K output through dual Thunderbolt connectors, each on a dedicated bus.