

Versatile Network Switching



Chronos for TSN – Switch Configuration Tools

Our next generation, configuration tools designed for safety-critical applications and integration into MBSE and MBD integration toolsets



Self-Service Network Configurations

- Field-configure any TSN-compliant devices to rapidly deploy a coherent network configuration to all devices
- Auto-schedule a mix of best-effort and deterministic ethernet traffic
- Define and configure VLANs with associated rate-constraints
- Perform worse-case latency, jitter and overall determinism checks



Support for Open Standards

- IEEE 802.1: FDB & Qcc for Stream Reservation and Routing
- IEEE 802.1: AS, Qbv & Qav for Time Sensitive Streams
- IEEE 802.1: Qcp & Qcw for YANG-based device configuration
- Many others supported, see next page



Purpose built for Safety-Critical Applications

- Developed in per to Aviation's DO-178C/DO-330 and compatible with other safety-related such as ISO-26262 and IEC-61508
- Built on a qualified software stack for in-service commercial aircraft
- Fast and robust for configuring large vehicle networks



Flexible Integration

- GUI or command-line interface to process several input and output file formats
- Easily integrates into your MBSE toolchain or leverage GE's MBD Integration avionics integration toolset
- Kickstarter guides and detailed manuals to aide integrations



Photo: USAF



Features

Operating Systems	<ul style="list-style-type: none"> • Microsoft Windows® 10 64-bit • Ubuntu Linux 64-bit (anticipated for FY2022)
Inputs	<p>Standard Parsers</p> <ul style="list-style-type: none"> • IEEE 8021.Qcc XML <p>Custom Parsers</p> <ul style="list-style-type: none"> • DDS (Data Distribution Service), Microsoft Excel, and Network Configuration file (NCF)
Outputs	<p>Programming</p> <ul style="list-style-type: none"> • Support for directly programming TSN devices as runtime via NETCONF or SCP • YANG models for IEEE standards, select draft standards, & vendor specific
Features	<p>Topology & Streams</p> <ul style="list-style-type: none"> • Interactive GUI representation • Link utilization and flow indication • Ability to save and recall custom layouts • IEEE802.1CB Frame Replication and Elimination <p>Scheduling & Analysis</p> <ul style="list-style-type: none"> • High performance scheduling engine to robustly handle large networks • Link Utilization Distribution, Transmission & Reception Strip Chart • Flow Arrival Time, Network Latency, Packet Delay Variation <p>Supported Standards (not all are listed)</p> <ul style="list-style-type: none"> • IEEE Std 802.1AS Time Synchronization • IEEE Std 802.1Qbv Time Aware Scheduling • IEEE Std 802.1CB Frame Replication & Elimination • IEEE Std 802.1Qci Ingress Policing* • IEEE Std 802.1Qav Forwarding and Queuing Enhancements* • IEEE Std 802.1Qbu Frame preemption* • IEEE Std 802.1Qca Path Control • IEEE Std 802.1Qcc Stream Reservation • IEEE Std 802.1Qcp Base yang data models • IEEE Std 802.1 Qcw Yang data models for config
Aerospace Specific	<ul style="list-style-type: none"> • Generate A665-3 Load Items and optionally the full LSAP (anticipated for FY2022) • Qualification per DO-330/DO-178C

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