



PacStar TFS

Tactical Fusion System (TFS)

Key Features

- Smallest SWaP available, today improves mobility and ruggedization compared to any other option
- Modular system can be optimized for program needs, maximizing number of CPU cores, GPU cores, solid-state storage, radio types, depending on program needs
- Based on Intel and NVIDIA processors and compatible with a wide variety of applications, can meet the needs of a vast array of C5ISR use cases
- Comprehensive packaging options including 1U, 4U, Rugged 4U+, and U.S. Army SAVE mounting options
- Includes built-in DOD Standard Batteries providing automated backup power for continuous availability
- Expandable/modular system can be reconfigured on the fly. Compatible with all PacStar 400-Series modules and sleds
- Managed by IQ-Core® Network Communications Manager, providing network and server management capabilities for the tactical communicator

PacStar® TFS is a COTS-based, modular, tactical and expeditionary, rugged processing and data distribution node for sensor-enabled platforms and dismounted warfighters.

PacStar TFS provides a low SWaP-C, rugged, modular COTS, interoperable family of solutions based on the next generation models of the field proven PacStar 400-Series. The system is ideal for:

- Processing and analyzing video in visible and IR spectrum for target identification, tracking and handoff
- Integrating multiple sensor input from multiple end points, including from wireless sources
- Supporting situational awareness, C2 and mission command applications
- Distributing data, including geographic information and point-of-interest information to tactical squads
- Executing computer vision, AI and ML algorithms with low latency

Using the smallest form-factor, most rugged, most widely deployed tactical compute and networking equipment today, PacStar TFS's modular, open architecture approach includes a family of more than 35 module types, including compute with GPU, storage, switching, routing, radios, crypto and more. Available with an unmatched array of vehicle-mount and warfighter carry options with MIL-STD certifications, PacStar TFS can meet the needs of the most demanding users.

Because PacStar TFS uses the field-proven and highly interoperable PacStar 400-Series, it offers a vendor agnostic platform for supporting a vast array of industry standard devices including COTS and GOTS software and can support any IP-enabled EUDs including cameras, AR/ VR headsets, and legacy video and radio sources.

PacStar TFS demonstrated interoperability with the most popular tactical software and infrastructure products, and the most promising emerging technologies, ensure future-proofing and upgradeability, including:

- Microsoft Azure Edge / IoT Edge – for Azure replication and IoT/Sensor integration
- Haivision Kraken - DoD-compatible video transcoding
- Digital Barriers ServerViz – AI/ML based video analytics with extensive object recognition and tracking
- TAK Server – secure, broker and stores data for group collaboration via TAK clients on Windows, Android and iPhone
- Kinetica – IoT streaming data warehouse and AI/ML analytics database

Solution Architecture

Next generation architectures processing and data distribution nodes, for platform and dismounted warfighters, enabling sensor and video enhanced situation awareness require a number of classes of components including:

- The node itself, comprising general purpose and GPU compute resources, storage, networking and radio gateways – running mission command, SA, C2 and management applications.
- Nodal and end-point radio infrastructure including SATCOM modes, Wi-Fi devices, tactical waveforms such as TSM, UWB, and legacy radios.
- End-point devices including video cameras and other sensors (in visible light and IR), RADAR, LIDAR, etc.
- End-point displays including legacy displays, platform displays and warfighter worn AR/VR headsets and mobile devices





Solution Contents

PacStar TFS core components include:

- PacStar 453 and 454 NVIDIA GPU-accelerated Servers
- PacStar 451 Xeon D-based Servers
- PacStar 447 Secure IP Routers
- PacStar 448 10 GigE Switches
- PacStar 466 and 467 RoIP Gateways
- Wi-Fi, 5G, and MANET LAN

Other PacStar 400-Series modules and sleds may be substituted or combined as necessary to meet program or mission objectives.

These components are typically mounted in PacStar Smart Chassis with UPS, and turn term packaged in PacStar custom transit cases, vehicle mount frames

including SAVE, 1RU or 4RU+ 19” Rack Mount Frames, or in Pelican™ cases with custom foam.

Components of PacStar TFS can be mixed and matched with the entire family of PacStar 400-Series modules, in thousands of combinations. For ease-of-configuration, PacStar created two example configurations for mounting in the PacStar SAVE Frame, shown below.

As shown in Example B below, the compact size also allows additional PacStar, or additional non-PacStar equipment to mount in the SAVE Frame, such as CMOSS/ VPX based equipment such as A-PNT devices, legacy radios, and more. This provides options for hybrid solutions that include legacy equipment, and provides for a smooth upgrade path to CMOSS.

Example	Components	CPU Cores (Physical)	RAM (GB)	NVIDIA CUDA Cores	Storage (TB) SSD	TFLOPS	Weight and Power
Example A – Full SAVE Frame	1x PacStar 454 GPU Server 1x PacStar 448 10G Switch Wi-Fi AP 1x PacStar 447 Router 2x PacStar 451 Servers	34	384	8448	28	535	Weight 58.5 lbs. Power 380 watts
Example B – ½ SAVE Frame	1x PacStar 453 GPU Server Wi-Fi AP 1x PacStar 448 10G Switch	24	128	4608	32	524	Weight 37 lbs. Power 140 watts

System Packaging

SAVE and Rack Mount

PacStar TFS can be integrated in a PacStar 492 Rack Mount, Standardized A-Kit Vehicle Envelope (SAVE) frame or and operating in up to (2) PacStar 400-Series Smart Chassis. PacStar’s industry-leading SWaP-C reduction allows maximum performance within the minimum size, allowing the system to include additional shock-isolation mounting.

Key Specifications

- Shock isolated frame measuring (15.87” x 8.73” x 13.58”)
- Holds multiple Smart Chassis with a maximum (8) module payload - e.g. (2) 4-slot Smart Chassis
- Smart Chassis are user removable and capable of operating outside the transit case; enabling physical separation as required for classified enclaves

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Smart Chassis

- Total power draw up to 700 watts max (depending on configuration)
- Worldwide AC input, 47 - 63 Hz, 85 V - 264 V
- Wide-range DC input, 10 - 35 V DC
- Includes in integrated UPS with two battery options
- DoD standard 2590 Li-Ion rechargeable battery, 294 watt-hours rated
- NiMH BB-390B/U rechargeable battery. 117 watt-hours rated
- Automatically switches to battery if prime power is interrupted
- User accessible battery compartment
- LED indicators for battery status



PacStar 400-Series Modules

PacStar TFS Solutions leverage PacStar 400-Series modules to architect maximum compute and networking capabilities in smallest rugged form factor. Network switch and router module options support Cisco IOS XE network management, while server modules deliver x86 compatibility with removable high-speed storage.

Key Features

- Dimensions: 5.3" x 7.1" x 1.6" (PacStar 451, 448), 5.3" x 7.1" x 3.4" (PacStar 452), 5.3" x 7.1" x 3.5" (PacStar 453), 5.3" x 7.1" x 5.4" (PacStar 454, 455)
- Weight: ~2.5 lbs. to 6.5 lbs each, depending on model
- Snap-together connectors provide DC pass-through for powering additional PacStar 400-Series products
- Operational temperature -20C to 50C / 60C / 70C, depending on module
- Extensively tested to MIL-STD-810 and -461 by independent labs. Reports available on request.
- Battery snap-together connectors for 1 or 2 AN/PRC-148 radio batteries; hot swappable with up to 5+ hours runtime per battery
- Wide-range DC input, 10-35 V DC
- Worldwide AC power input (with adapter cable)
- Power draw: Nominal 18 to 240 watts per module, depending on module type

PacStar products are covered by multiple patents. Additional patent(s) pending.

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