Adding Assurance to the Supply Chain to Increase Trust with Customers

WHITE PAPER

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With the rapid development of data centers, cloud computing, big data and artificial intelligence, the ability to provide customers with safe and reliable hardware platforms has become one of the core competencies of major hardware manufacturers. As one of the world's top three server vendors, Inspur has been working with Intel to establish a more transparent and controllable supply chain system, by adhering to the Intel® Transparent Supply Chain (TSC) process in order to provide more secure, reliable server product solutions. This document serves to share TSC's business values from Inspur's point of view and explain the major steps Inspur has taken to complete the Intel TSC certification requirements.

Increased Manageability in the Supply Chain

TSC has improved the granularity of data management from motherboard and system manufacturing by Inspur.

1. During the production of the motherboard, Inspur collects the production date of each motherboard unit, the manufacturing plant, the production work order for the active and passive components on the motherboard. Sourcing information such as component supplier information, manufacturer information, component manufacturing date, purchase date, component location information on the motherboard as well as firmware information, etc. This data is used to generate the ABD ("As Build" Data) file for each motherboard. Inspur and the production factory worked together to optimize material identification and collection modules in the WMS/SFCS/Mounting Machine System, and developed the FW burning control module and various information integration modules to meet the ABD data collection requirements. In addition, testing program has been modified to add the testing of PCD (platform certification data) data collection.

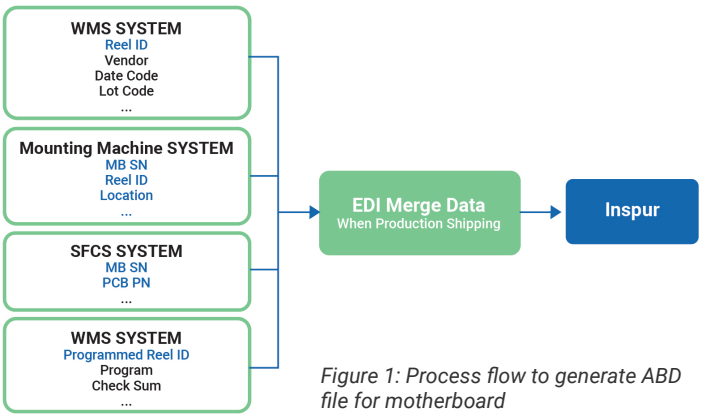

Figure 1: Process flow to generate ABD file for motherboard

2. During the L6-L9 system assembly process, for each assembled server system, Inspur collects the production date, production plant, production order and all key components used in the system assembly, including supplier information, manufacturer information, purchase date, batch information, installation location, etc., to generate ABD files for the system. The factory will scan the key parts such as SN and PPID information which binds with vendor information, Date Code information, etc., to enable traceability to Vendor and Date Code of the components. The factory scans the material SN in the MES during the system assembly process, and uses the scanning material number and installation instructions to install the material in the corresponding location. The material and its corresponding location are then stored in the MES product file, ensuring traceability to the installation location of each individual component. Meanwhile, the factory will collect the work order number, system SN, work order production date and other data, to generate the system ABD file.

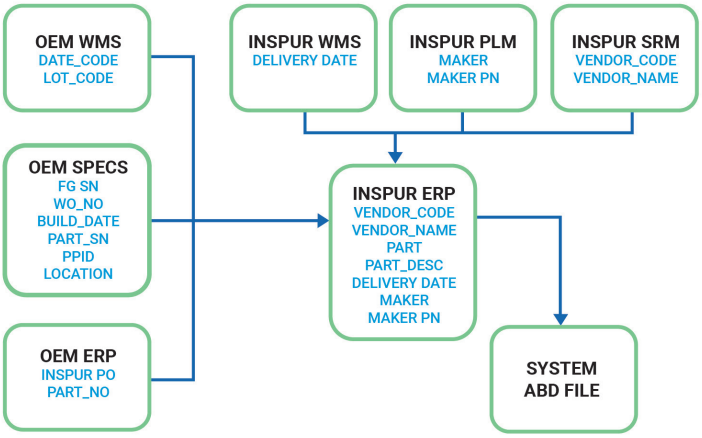

Figure 2: System ABD file generation process

3. The implementation of TSC has improved the traceability of raw materials for both the motherboard and system. It provides more detailed and accurate data for product quality analysis, which will significantly improve Inspur's ability to locate and analyze product quality, and identify counterfeit or inferior raw materials, thereby enhancing Inspur's product quality control.

TSC further enhances Inspur's capability of supply chain management

1. Through TSC, Inspur can better monitor Contract Manufacturer (CM)'s raw material purchasing. TSC requires traceability of raw materials which allows Inspur to better manage material information purchased by the contract manufacturers and procurement channels. When incoming goods are received, information such as PN, maker, vendor, D/C, L/C, etc. are collected then bounded with REEL ID. During the production process, the REEL ID gathers all the relevant information which is then stored in each module of the system in production. Through the module of information integration, the data of each module is retrieved, and the ABD file is generated. This allows Inspur to more effectively monitor raw material purchasing by the CM.

2. In the case of using motherboard Contract Manufacture (CM), TSC achieves the transmission of data between Inspur and the motherboard CM. When identifying the root cause of a defected product, it allows Inspur to more efficiently grasp the material information needed for data analysis, more effectively trace and analyze motherboard issues, and improve response time to quality concern or customer complaint.

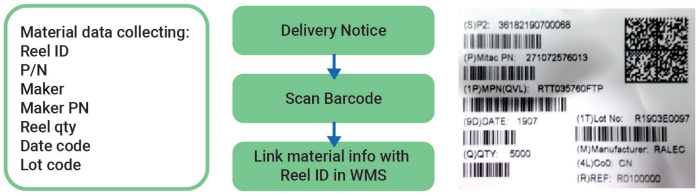

Figure 3: Material information binding to Reel ID

Provide more transparent and secure products to customers

When customers purchase TSC-certified products, upon receipt of the products and through Intel's authentication platform, they will be able to query the system and motherboard production date, key material purchasing Information, supplier information, manufacturer information, key material location information on both motherboard and system, and key chip software information, etc. This allows customers to gain understanding and confidence in Inspur products. During the production process, Inspur generates the ABD files for both system and motherboard, the PCD file for motherboard, and the DPD file for the system. These files are then uploaded via the interface by Intel to the customer's SFTP Server. Customers can download and use these files through Intel's Web Portal and Account Login System, and verify the consistency between the purchased system and the uploaded files from Inspur.

When customers purchase products certified by TSC, they can quickly query the SN/ Lot Code information of the raw materials and use this information to verify the authenticity of the key components and raw materials. This should effectively help reduce customer's concern on hidden product quality issues due to counterfeit parts.

Customers who purchase TSC-certified products can use the Auto Verify Tool to check for any change of parts after the products are shipped. This will help prevent customers receiving products that have been replaced with counterfeit or retreaded components or loaded with spy chips. It should more effectively safeguard the product and data safety to the customers.

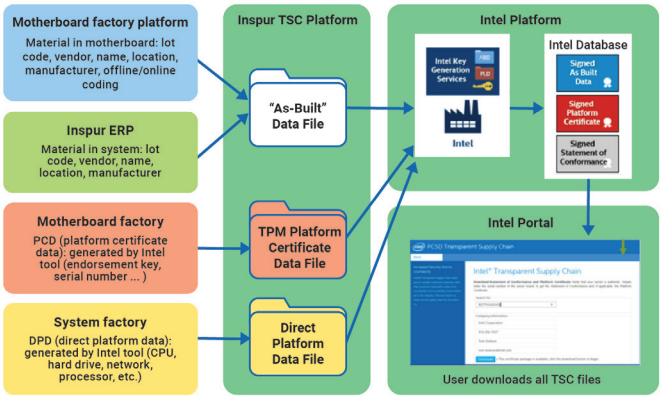

Figure 4: System factory TSC file upload & customer download process

Step 1: Download the Auto Verify Tool from Intel TSC portal

Step 2: Download the following files: As Build Data (ABD) for the motherboard, ABD for the system, signed X.509 Platform Certificate file for the motherboard, Direct Platform Data file for system and the signed Statement of Conformance from established Intel TSC portal

Step 3: Run the Auto Verify Tool to check for any changes in that hardware comparing what the customer received to what was shipped from the original design manufacturer. Changes in key system components will be flagged.

Step 4: Run the Auto Verify Tool to perform the Platform Attestation using the signed X.509 Platform Certificate cryptographically bound to the TPM 2.0 module on the motherboard

Partnering with Intel

Inspur will continue to work with Intel to complete TSC certification for additional factories and products. Intel has demonstrated leadership in supply chain security and the partnership between Inspur and Intel in this TSC certification process is strong and rewarding.

For future purchases of Inspur products certified by TSC:
www.inspursystems.com/TSC

REFERENCES

Tom Dodson, "Add Trust to Your Supply Chain"
www.embedded-computing.com/iot/add-trust-to-your-supply-chain