

Skyward Interfaces Audit

Types, Completeness, Accuracy and Control

**Internal Audit Report
February 9, 2024**



**Orange County
Public Schools**

Internal Audit

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Skyward Interfaces – Types, Completeness, Accuracy & Control of Interfaces

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BACKGROUND:

This audit report is part of an overall review of the Skyward system interfaces. Skyward is the district's student information system. This Software-as-a-Service product provides the district with various functionalities such as student management, state reporting and gradebook among many others.

This interface audit was conducted in three phases: Policies and Procedures; Access & Security (Logical and Physical) and Types, Completeness, Accuracy & Control of Interfaces. The first two phases were previously completed and this report is for the Types, Completeness, Accuracy & Control of Interfaces.

As of February 9th, 2024, the Skyward system had a total of 114 interfaces: 7 with internally-hosted systems¹, 94 with externally-hosted systems (62 of which are for class courses), 5² with non-SIS³ systems, 4 with systems managed by the State of Florida⁴, two interfaces with a manual process⁵ and one with Transfer Folders and an SIS system⁶. The majority of these interfaces are exports from the Skyward system, but the list includes imports, exports and imports/exports.

[Webopedia](#) defines interface as a boundary across which two independent systems meet and act on or communicate with each other. In computer technology, there are several types of interfaces. The article mentions three types of interfaces: user, software and hardware:

- User interface - the keyboard, mouse, menus of a computer system. The user interface allows the user to communicate with the operating system.
- Software interface - the languages and codes that the applications use to communicate with each other and with the hardware.
- Hardware interface - the wires, plugs and sockets that hardware devices use to communicate with each other.

¹ MCS, Formatta, TransFleet, Archibus, Magnet Lottery, Find My School and Destiny.

² SAP, ActiveDirectory, EDW, Cognos and OBIEE.

³ Student Information System.

⁴ DMV, FASTER, State Reporting and Sunshine Connections (PEER).

⁵ Assessments from State & Vendors and Roster Classes.

⁶ CampusVue.

We evaluated interfaces between the Skyward student information system and other applications.

The audit was conducted in three phases. This is the third phase.

At February 9, 2024, the district had 114 interfaces between Skyward and other systems.

A definition for interface is a boundary across which two independent systems meet and act on or communicate with each other. In computer technology, there are several types of interfaces.

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So, an interface can occur at the logical (software), physical (hardware) and user levels. This phase will focus on the logical and physical aspects of the interface.

OBJECTIVES, SCOPE AND METHODOLOGY:

Objectives

The overall objective is to evaluate the effectiveness of the District's security for Skyward interfaces. In this phase, the objective is to determine how many data imports and exports the SIS has; what measures are in place to determine the completeness & accuracy of the data once it reaches its final destination; what technical standards are used; and if the interfaces are documented and what plans (if any) exists or have been developed to address any gaps between current and future interface demand.

Scope

The scope of the audit assessed interfaces based on criticality and importance to the Skyward system and to district operations. In this phase, we focused our tests on the total imports and exports as of December 8th, 2021.

Methodology

We conducted this audit in accordance with the *International Standards for the Professional Practice of Internal Auditing* of the Institute of Internal Auditors and included such procedures as deemed necessary to provide reasonable assurance regarding the audit objective. Internal Auditing is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes.

We are required to note any material deficiencies in accordance with Florida Statutes, School Board Policy and sound business practices. No material deficiencies were noted in this audit. We also offer suggestions to improve controls or operational efficiency and effectiveness.

The objective in this phase is to determine whether effective logical & physical access and security were documented and implemented.

We assessed the interfaces based on criticality and importance to the Skyward system.

We conducted this audit in accordance with the International Standards for the Professional Practice of Internal Auditing.

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Our tests measured and determined whether the district knew the types of interfaces the Skyward system has and the completeness, accuracy and control of the data transmissions of the Skyward system.

For this audit, we assessed these things by evaluating:

Types, Completeness, Accuracy and Control of the data transmissions

- Types of data transmissions⁷
 - Data exports
 - Data Imports
- Completeness of data^{8 9 10}
 - Data Transmission
 - Data at Rest
 - Analysis of transmissions logs
- Accuracy of the data
 - Data Transmission
 - Data at Rest
 - Analysis of transmissions logs
- Control of the data
 - Industry standard used for the interfaces¹¹
 - Documentation of the interface¹²
 - If plans exist or have been developed to address any gaps between current and future interface demand¹³

RESULTS & RECOMMENDATIONS:

⁷ How many data exports and imports Skyward has?

⁸ Data in Transit - imports and exports - possible data or tunnel encryption. What measures are in place to determine that the data is complete once it reaches its final destination from Point A to Point B?

⁹ Exports waiting to be processed - possible data or tunnel encryption. What measures are in place to determine that the data is complete once it reaches its final destination?

¹⁰ If available - for all transmission types. Who has access to them? Reason for access? Are they protected? Can they be edited?

¹¹ To determine if they took into consideration the use of any technical standard (ISO or other standard) to developed the interfaces.

¹² Document describing the interface.

¹³ If the district has considered the possibility of new interfaces to be added to the Skyward interface model in a future and the expected growth in system resources for the new and current interfaces.

We noted no material deficiencies in this audit.

Our tests included the following:

- ❖ *Type of data Transmissions (exports & imports - how much information is coming in and out of the Skyward system*
- ❖ *Completeness, of the data – if the file was intact during its path from Point A to Point B while in transit and at rest.*
- ❖ *Accuracy of the data – if the file was not changed as it was sent during its path from Point A to Point B while in transit and while at rest.*
- ❖ *Control of data – if they took into consideration the use of any technical standard to developed a functionality to control and monitor the interfaces.*

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Overall Conclusion: Our overall conclusion is the district knows what types of interfaces¹⁴ the Skyward system has and they have oversight over them. We noted the district also knows that the data from the interfaces are complete by receiving error reports and error log messages regarding any of the system interfaces. As for the accuracy of the interface when it reaches its final destination, they submitted evidence of the credentials used to perform the interface. In other words, in order to execute the interface, they have to use the following:

- Certificates to ensure the recipients are who they say they are.
- Secured credentials that are used to configure the jobs (interfaces) within the Skyward system.

These pieces of evidence range from credentials provided directly from the vendors; specific Skyward API ¹⁵ URL¹⁶ created by OCPS; generated key/secret directly to the vendor to connect to the Skyward API; and SFTP ¹⁷ and HTTPS ¹⁸ addresses to protect data during transmission as each function encrypt the transmitted data.

As for interface controls, we concluded the district used industry standard requirements in the implementation of the Skyward system, all the interfaces are documented in detail and they monitor the interfaces along with performance factors. As for expected growth for future interfaces, the district addresses any gaps between current interfaces and current/future demand and manages factors associated with expected growth in interface demand by developing new interfaces as part of enterprise projects (that were started as a result of Business Cases). The Business Case process is managed by the project management office. Part of these processes include planning tasks and resources. Other smaller interfaces would follow normal development processes.

Our overall conclusion is the district knows what types of interfaces the Skyward systems has and they have oversight over them. Also, we noted the district knows data from the interfaces are complete and accurate when it reaches its final destination.

As for expected growth for future interfaces, the district has to address any gaps between current interfaces and current/future demand and to manage factors associated with expected growth in interface demand.

¹⁴ Imports (4), exports (8 – including a database) and import/export (5).

¹⁵ Application Programming Interface.

¹⁶ Uniform Resource Locator.

¹⁷ Secure File Transfer Protocols.

¹⁸ Hypertext Transfer Protocol Secure (and extension of the HTTP).

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No recommendations were made as a result of this audit.

We wish to thank personnel from the ITS, SIS & Projects departments (including contractors) for the cooperation and assistance we received in the course of this audit.