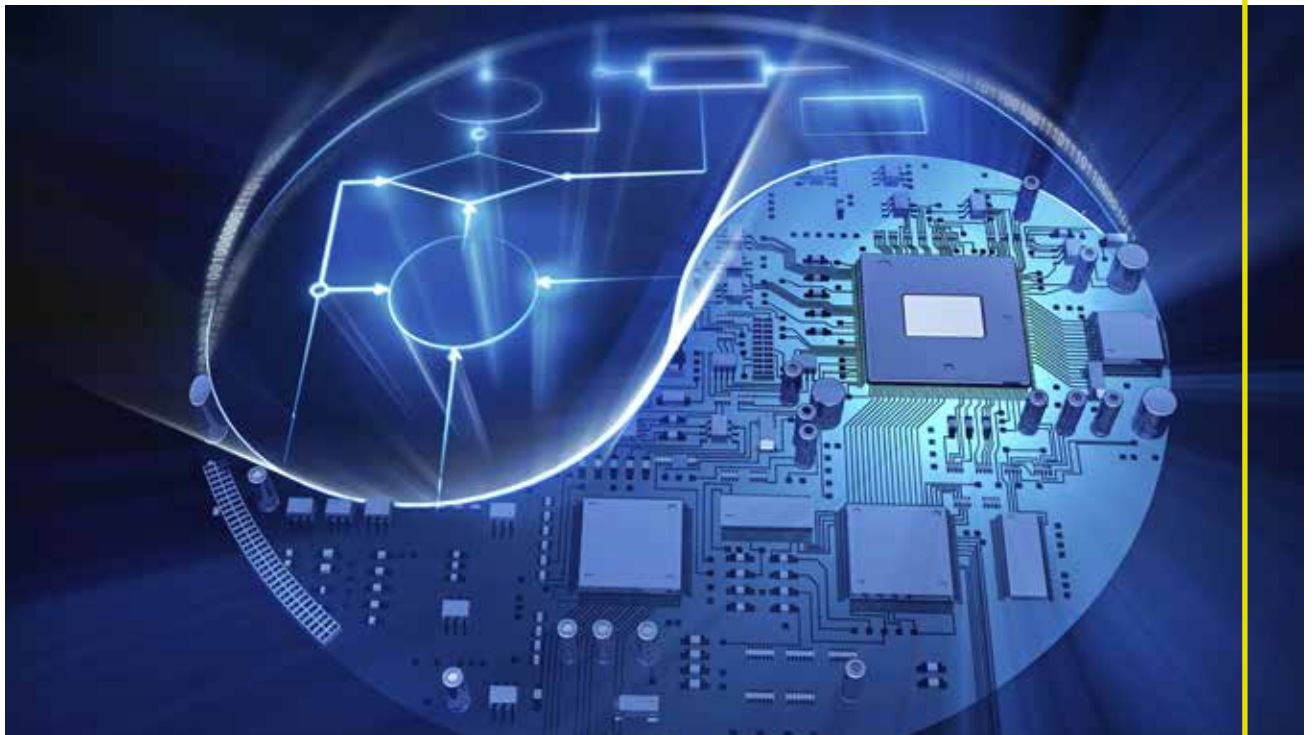**Whitepaper**

HARDWARE INTEGRA-
TION PLATFORMS

An Alternative to Software Integration

INTEGRATION is a process associated with the unification of previously heterogeneous parts and elements. Integration processes can take place both within the framework of an established system, in which case they result in more integrity and a better organization, as well as when creating a new system using previously unrelated elements. Individual parts of the integrated whole may have varying degrees of autonomy.

«Encyclopedia of Philosophy»

Software integration is a never ending story

With the ongoing digitalization of organizations and the increasing number of systems and IT platforms in use, there is a clear interest to integrate disparate systems in order to enhance the working efficiency of individual employees. Currently, the most common approach to integrating systems is via software integration. This trend is being promoted by software integration companies and there are certainly situations when software integration is the best or only acceptable solution.

But let's take another look. An organization that decides on the software integration approach hires software developers, waits for the product, deploys it, and everything works out great. Hallelujah! But problems start when a new version of a software application is released and the software integration package does not work anymore. The obvious solution is to amend or refine the integration software, again costing time and money. But soon there is another application update and the cycle begins again. And then the operating system changes. And then the organization decides to decommission outdated computers, update the infrastructure, etc. And in each case, the company returns to the developers. This may be a gold mine for the developers but it is an ongoing headache and expense for the company.

And it gets worse. The supplier of a critical application is categorically opposed to any third-party «interference» in their software, refuses to provide API and command control codes, and threatens to cancel the warranty protection. They issue a statement which prohibits the deployment of third party software on the computer. What is the solution?

Hardware integration

Please note that «hardware integration» does not refer to «bus integration», which is a kind of hybrid hardware/ software integration. With bus integration, one must still develop software adapters to provide the interface between devices / applications on the common integration bus.

A distinctive feature of the hardware integration approach is that it provides ubiquitous access to any system's data from the user's desktop, and provides a single management console to operate, manage and control disparate systems and applications installed on multiple computers. "Pure" hardware integration has some significant advantages.
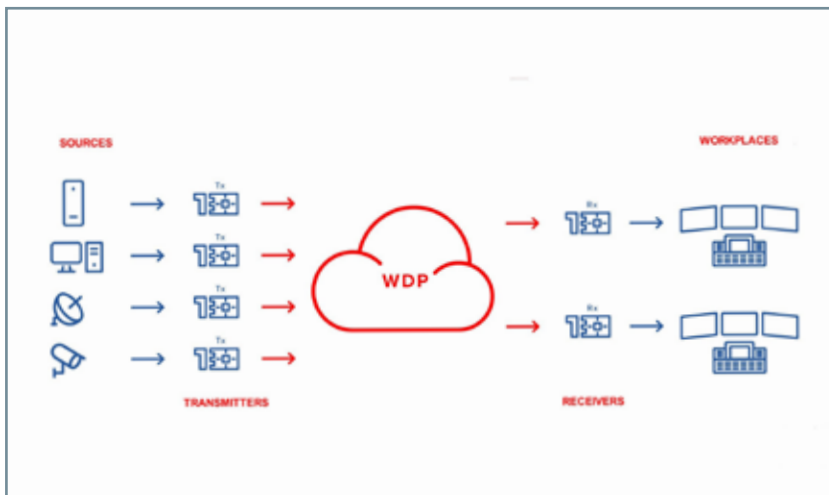
First it is easily deployed, i.e. within days, not months or years. Second, it is completely independent of specific hardware vendors, versions of software applications, operating systems and the absence or presence of APIs. Hardware components used for the integration do not interfere with the organization's applications, systems and computers. Third, there are no integration software programs on systems and sources consuming valuable computing power.

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The most straightforward hardware approach to integrating a computer starts by connecting a special trans-mitter card to any of its standard open interfaces (VGA, DVI, HDMI, DP, Audio, USB. PS/2, RS232). This retrieves the source's data without interfering in the computer's software or hardware. The transmitter cards are usually installed in a technical room near the computer, connected via copper or fiber optics cable. The transmitter sends the data to a receiver at the user's desk, where it connects to the peripheral devices.

Advantages

This approach has its advantages: all the usual devices (monitor, keyboard, mouse) stay at the desk while all the computers are moved from under the table to a secure, cooled technical room. This eliminates unautho-rized access to IT assets and data. In this very basic configuration, nota bene, an employee does not (yet) work with systems and sources that are not directly connected to his workplace, or are being used by colleagues (i.e. applications which are installed on other people's computers).

Hardware switching platform

The "unification of previously heterogeneous parts and elements» is solved in a second step. A hardware switching platform (WDP) is deployed to switch between the transmitter and receiver cards.

The topology of combining sources and workstations onto a single hardware-based network provides em-ployees with real-time access to any information source from any workplace. Images can be displayed on any monitors or video walls. And, the selection of a source and its allocation to a specific display is executed not by the system administrator, but by the user himself from the comfort of his desk using a single multifunctional keyboard. No one has to reconfigure or re-wire anything in the technical room.

Integration is thus achieved and a "new system emerges from previously unrelated elements" whereby the "individual parts have varying degrees of autonomy" and everything is managed with a single management console. And this is accomplished without interfering in the hardware or software components of the informa-tion systems themselves.

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Summary

Hardware integration has several advantages over software integration:

- Fully integrate all 3rd party systems and information sources irrespective of platform or application type.
- Full computing performance available at the desk
- Users can share the same information sources (shared access).
- Adding new workplaces, changing configurations and connecting new information sources can all be accomplished without any interruptions in service.
- Target systems and sources can be deployed in a hot-swappable manner.
- Operating all target systems with a single keyboard significantly increases operational efficiency.
- Hardware integration is achievable within days (not weeks or months).

As a footnote, there are multiple vendors providing hardware integration equipment. But, they do not all produce and supply the full range of equipment necessary for complete turnkey solutions in-house, or offer a full range of professional user support services according to the "one-stop-shop" principle.

But that's another story...

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