EMA™
IT & DATA MANAGEMENT RESEARCH,
INDUSTRY ANALYSIS & CONSULTING

EMA Radar™ Report for Workload Automation and Orchestration 2023

September 2023

By Dan Twing, President and COO
Intelligent Automation

Table of Contents

Introduction

Workload automation in 2023 marks a transformative era with significant advances by leading products to expand orchestration capabilities. Extending the use of workload automation to orchestrate broader and more complex workflows and processes is driving growth and investment interest. As a result, recent years saw strategic acquisitions and consolidation in the WLA market. Consolidation continued in this market in 2023. Redwood Software acquired Tidal Software and now controls three of the Value Leader products.

In 2023, EMA research identified a significant correlation between enterprises that have achieved maturity in digital transformation and enterprises in which workload automation and orchestration are valued and leveraged by architects, developers, and business executives in addition to IT operations. Digital transformation creates digital processes that can be complex and span business functions, applications, and systems, creating the need to coordinate and control broad end-to-end workflows. As a result, workload automation and orchestration (WLA) platforms are expanding orchestration features, allowing organizations to not only execute specific jobs or jobstreams, but also create end-to-end automated workflows that involve task sequencing, conditional logic, and cross-system coordination. Automation and orchestration are two key concepts within the realm of workload automation and orchestration, each serving distinct purposes in optimizing IT-driven processes.

Automation – involves setting up a single task to run independently. It focuses on the execution of a specific, predefined action without human intervention. This can range from simple tasks like file transfers or data backups to more complex operations, such as server provisioning or software deployments. The core idea is to eliminate manual effort and ensure that a task runs consistently and reliably.

Orchestration – takes automation to a higher level. It involves automating multiple tasks and processes to work together seamlessly. Rather than focusing on individual tasks in isolation, orchestration is concerned with the automation of entire IT-driven processes. It encompasses the coordination and integration of various automated tasks to achieve a larger, more complex workflow or process. The goal of orchestration is to streamline and optimize frequently occurring, repeatable processes that span across multiple systems and components. While workload automation traditionally focused on scheduling and automating individual tasks, it now embraces the concept of orchestration.

As enterprises continue to expand digital capabilities and further automate business processes, more organizations will learn to leverage workload automation and orchestration to expedite development and better manage the new digital processes. Orchestration is the megatrend in workload automation and as this expanded focus continues to mature, it is driving the changes in and around WLA. Four of the most impactful changes in 2023 that shape the landscape of workload automation and orchestration are reviewed.

Integration Evolution

To support orchestration, workload automation platforms have evolved to become integration powerhouses. The emphasis is not just on connecting with other applications and systems, but also on enhancing the depth and breadth of these integrations. Vendors are providing a rich ecosystem of connectors officially supported, enabling seamless communication between diverse software and systems. Furthermore, enhanced API capabilities offer a full range of console features, allowing organizations to automate complex workflows across their IT environment. Self-service tools for defining connectors and vibrant user communities for sharing integration solutions have become common features. The ability to integrate with anything and everything has become a paramount requirement for modern workload automation and orchestration systems.

Looking back four to six years, the trend was to enable users to create their own integrations. Many products delivered on this capability with full APIs, tools for low-code integration, and communities to allow sharing. While many organizations have leveraged such self-service integration capabilities, the trend since 2021 has been a return to the era of vendor-generated integrations, but at much higher volumes. Enterprises prefer integrations created by the vendors because they tend to be more robust, supported, backward compatible, and ready to use. Many vendors have radically increased their output of connectors and have added resources to continue to create integrations on a schedule, matching or exceeding releases of the general product.

Mainframe Modernization

For several years, cloud computing was at the forefront of infrastructure concerns. While cloud will continue to rise in importance, WLA software is quite well adapted to support cloud-based jobs and processes. The 2021 report mentioned the significant push to put production work in the cloud, with several European banks and insurance companies setting goals to be 100% in the cloud.

In 2023, there is a significant focus on mainframe modernization. Mainframes continue to play a critical role in many enterprises, serving as the backbone of mission-critical applications and data processing. However, these stalwart systems are undergoing a profound transformation to align with the imperatives of cloud computing, modernization, and digital transformation. Workload automation and orchestration is at the forefront of this transformation journey, supporting mainframe-based jobs throughout the modernization process. This process can include methods such as code refactoring, re-engineering, and rehosting/re-platforming. As organizations strive to strike a balance between harnessing the power of both legacy and modern technologies, supporting mainframe modernization remains a top priority in the workload automation and orchestration space. The goal is to ensure that mainframes continue to deliver value while aligning with evolving business needs.

The convergence of workload automation and orchestration, mainframe modernization, and re-platforming in the cloud forms a powerful strategy for organizations seeking to bridge the gap between legacy and modern IT environments. This approach enables enterprises to preserve their investment in mainframe technology while harnessing the advantages of cloud computing, driving digital transformation, and staying competitive in an ever-evolving technological landscape.

Data Pipeline Management Maturity

The management of data pipelines has become one of the most important use cases for workload automation and orchestration. With the ever-increasing volume and complexity of data, organizations are investing heavily in data pipeline management solutions. Workload automation and orchestration platforms are evolving to meet these demands, offering advanced features for orchestrating data workflows, data ingestion, transformation, and data movement. The emphasis is not just on managing data within the organization, but also on facilitating data exchange with external partners and cloud-based data services. Maturity in data pipeline management is critical for organizations looking to harness the full potential of their data assets and drive data-driven decision-making. Data pipelines and workload automation and orchestration are intricately linked because workload automation and orchestration tools provide the framework and capabilities needed to manage and optimize the execution of data pipeline tasks. They ensure that data workflows are orchestrated efficiently, reliably, and with minimal manual intervention, which is crucial in the world of big data and complex data processing scenarios.

DevOps as the Spark for Broader Orchestration

Automation and orchestration are essential to DevOps culture. Workload automation and orchestration plays a pivotal role in improving DevOps practices by automating key processes, reducing manual effort, enhancing consistency, and accelerating the delivery of software. It fosters collaboration between development and operations teams and helps organizations embrace the principles of agility, continuous delivery, and efficiency that are at the core of DevOps. Orchestration often finds its logical beginning as WLA is used to support DevOps.

WLA tools can automate the deployment process, ensuring that applications and updates are consistently and reliably deployed across various environments (development, testing, staging, production). This consistency minimizes deployment errors and reduces the risk of environment-related issues. WLA platforms can seamlessly integrate with CI/CD pipelines, automating the building, testing, and deployment of code changes. This automation speeds up the release cycle, enabling faster delivery of software updates and features.

DevOps teams often require multiple environments for development, testing, and staging. WLA can automate the provisioning of these environments, ensuring that they are consistent, reproducible, and ready for use when needed. This reduces delays that manual environment setup causes. WLA also helps to manage configuration files, release coordination, dependency management between services, rollbacks, and audit compliance. As developers find value in automating and orchestrating the DevOps process, they often begin to see how to leverage WLA to create and manage digitally transformed processes.

Given the trends observed, EMA made changes to the WLA Radar evaluation model and weighting of capabilities to effectively measure vendors that support the important legacy capabilities of WLA, as well as moving their products and this market toward the future of broader automation and orchestration. These changes are highlighted in Appendix A, which includes details behind all the metrics used in this analysis.

Research Methodology

The major challenge of this type of market evaluation is to avoid creating a simple feature comparison. EMA is aware that in order to be valuable for the end customer, any analyst report must thoroughly research and consider the client's perspective. Since enterprise IT is generally focused on solving actual customer challenges, each software feature is only relevant to this report if it solves a specific and important business problem.

To remain entirely objective, EMA based this Radar on a comprehensive survey with over 600 data points that can, for the most part, be measured unambiguously. All vendor survey questions were founded on customer feedback and vendor responses; they were thoroughly verified by a sequence of product demonstrations and end-customer interviews.

EMA acknowledges that in WLA, as well as in most other arenas of enterprise IT, there is no one best solution for every customer. Therefore, EMA evaluated each product along five dimensions:

- Functionality
- Architecture & Integration
- Deployment & Administration
- Cost
- Vendor Strength

Based on these five dimensions, a potential client might select a solution that is only rated as "average" in terms of functionality, but is easily deployed, requires minimal maintenance, and costs significantly less than some of the functionality leaders. Others may focus on key features and look for a product that balances advanced capabilities with cost and administrative effort.

EMA's guidance along these five dimensions will enable potential users to determine which solutions warrant a closer look. This determination can mean narrowing down the field to only three vendors, or it may cause an organization to include lower cost alternatives into its RFP process. This report will have achieved its purpose if EMA has provided potential WLA customers with the background knowledge and guidance necessary to confidently make this preselection decision.

Research for the 2023 WLA Radar Report took place starting in Q2 2023. For details on the requirements used to evaluate the participating vendors and details on the changes to the measurement criteria from the 2021 report, please refer to Appendix A.

Vendors Included in This Report

Evaluation Criteria

Each product feature was required to fulfill the following three criteria to be credited with a specific element or capability.

- **General availability:** The features needed to be generally available in the solution set at the time of the evaluation. Features that were in beta testing or were scheduled to be included in later releases of the management suite were not eligible for consideration. The cutoff date was July 31, 2023.
- **Included in cost:** All features in the evaluation also had to be priced into the total product cost. To evaluate the total cost for each product, EMA provided each vendor with four hypothetical customer scenarios to evaluate comparable list pricing.
- **Documentation:** All reported features had to be clearly documented for verification in publicly-available resources, such as user manuals or technical papers.

EMA Workload Automation and Orchestration Radar Results

The total product value is defined by comparing the overall product strength of each WLA solution (y-axis) with its cost-efficiency (x-axis). Product Strength combines evaluation scores for Functionality and Architecture & Integration. Cost-Efficiency is calculated from the scores achieved from the Cost Advantage and Deployment & Administration categories. The size of each vendor's bubble indicates the vendor's strength as identified in its individual review.

Key Changes Compared to the 2021 WLA Radar Report

Comparing the 2023 chart with the chart compiled in 2021, EMA makes the following observations:

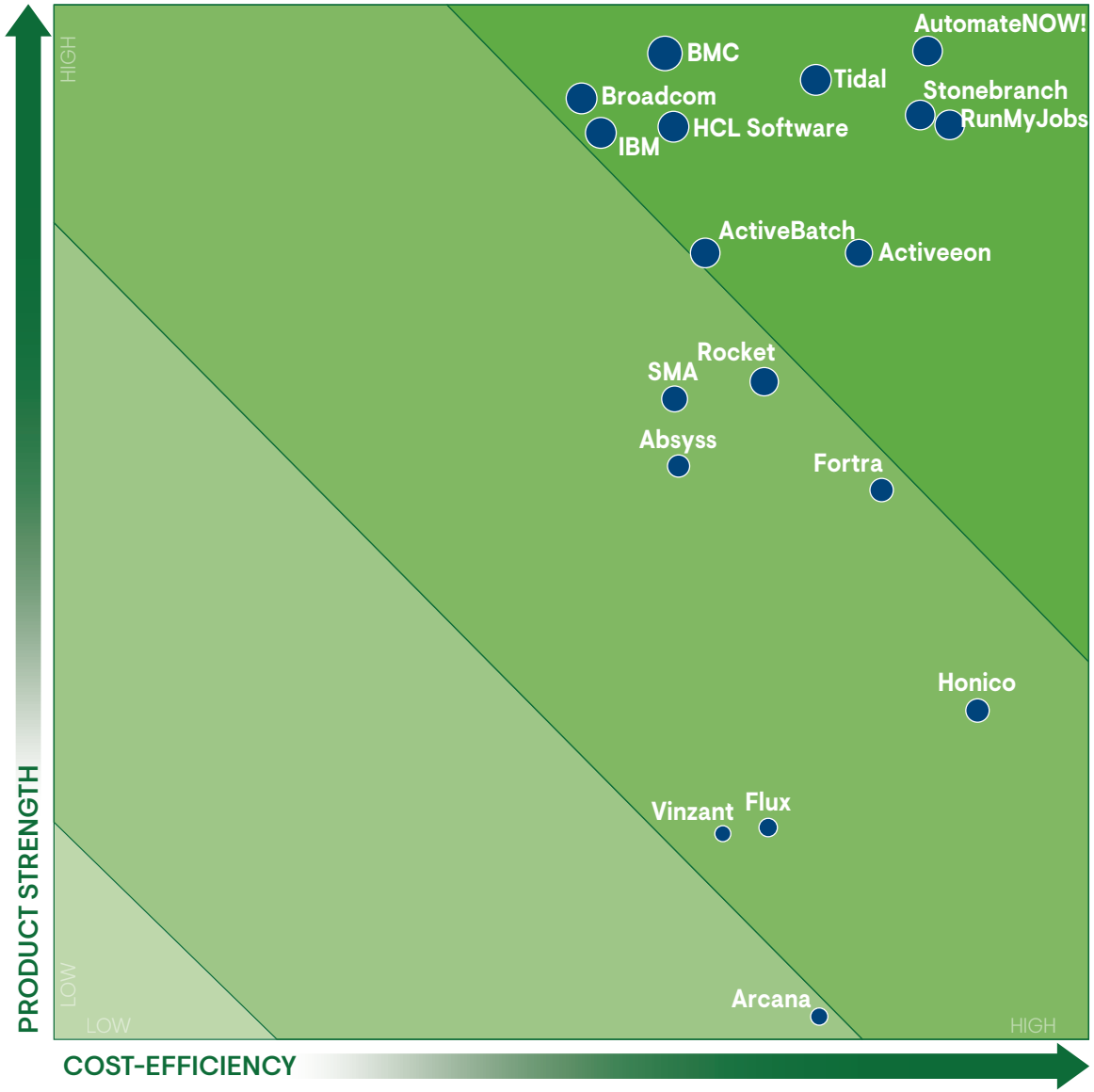
- The chart includes a mix of company and product names. Traditionally, this report used company names. However, with Redwood Software owning three products each previously reviewed in this report, all three were reviewed separately. InfiniteDATA is also represented by their product name.
- EMA included two additional vendors: Absyss (Visual TOM) and Honico (BatchMan)
- Fortra, Hitachi, and SMA were evaluated by reviewing publicly available information such as documentation, release notes, blogs, and online reviews and updating the information previously provided.
- Hitachi (JP1 AJS3) was removed from the report at their request.
- EMA is no longer covering Arvato Systems (streamworks).

WLA Radar 2023

VALUE RATING

VALUE LEADER | STRONG VALUE | SELECTIVE VALUE | LIMITED VALUE

VENDOR STRENGTH



Activeeon: Activeeon is a Value Leader in the 2023 EMA WLA Radar, offering open source solutions for IT automation and application orchestration. They aid companies in automating business processes and hastening time-to-market via workload automation and orchestration. Beginning with ProActive Workflows and Scheduling (PWS) for broad workload automation and orchestration, their latest product, ProActive AI Orchestration (PAIO), provides comprehensive AI orchestration from DataOps to MLOps. Activeeon offers on-premises or managed cloud solutions on popular platforms, aiming to simplify IT tasks across hybrid environments. Activeeon is recognized as a Value Leader in the 2023 EMA WLA Radar. They offer open source solutions for IT automation, scalability, big data, AI/ML, and application orchestration. Activeeon, originating from a leading European IT research center in 2007, aims to simplify IT tasks across hybrid environments and reduce operational complexities for enhanced efficiency.

ActiveBatch by Redwood: ActiveBatch by Redwood secures its position as a Value Leader, offering a user-friendly workload automation and orchestration (WLA) platform. It enables simple automation of business and IT processes without coding. The platform provides ready-to-use connectors, Windows support, a powerful REST adapter, and prebuilt actions. It features a no-code drag-and-drop interface with guided tools, facilitating workflow creation. Job allocation, dynamic scaling, cloud provisioning, and graphical optimization enhance workload efficiency. ActiveBatch monitors through dashboards, a self-service portal, SLA tracking, and notifications, serving as a robust upgrade from in-house systems and OS schedulers. ActiveBatch became a Redwood product as the result of a merger between Advanced Systems Concepts, Inc. (ASCI) and Redwood Software in February 2022.

BMC: Control-M from BMC maintains its Value Leader status, showcasing robust capabilities in the realm of application workflow orchestration. Its standout feature lies in its seamless extension across diverse cloud environments, enabling end-to-end workflow management with a focus on timely execution. The platform's integration capabilities span on-premises, public, and private clouds, offering comprehensive oversight of file transfers, applications, and infrastructure. Its extensive integrations with AWS, Azure, GCP, and more facilitate seamless workflow management. Moreover, Control-M excels in data pipeline creation and management, streamlining integration across platforms like Airflow, Hadoop, and Spark. The innovative Jobs-as-Code approach fosters effective collaboration within the DevOps landscape, while self-service interfaces drive innovation and agility. Enhanced by predictive analytics, comprehensive monitoring, and auditing features, the platform ensures adherence to compliance and governance standards.

Broadcom: Broadcom Software's Automic Automation once again secures its position as a Value Leader, offering comprehensive digital business automation capabilities that prioritize agility, reliability, and efficiency. While Broadcom Software supports a diverse range of automation products, Automic Automation v23 is the only Broadcom product evaluated in this report. This unified platform empowers orchestration and automation, driving digital transformation and business growth. Providing holistic visibility and consistent automation across various platforms, from mainframes to cloud environments, it features observability, workflow orchestration, event-driven automation, self-service, and SLA management. With a strong focus on security and governance, the system enables businesses to proactively address potential issues at scale, enhancing customer experiences.

AutomateNOW! by InfiniteDATA: InfiniteDATA remains a Value Leader with the AutomateNOW! (ANOW) enterprise automation and orchestration platform. ANOW includes a fully web-based interface and adheres to the one-click-away concept for a simple-to-operate interface. The platform comprises a server (CPE) and a variety of processing nodes (agents) with different types and communication channels. With a single license, ANOW offers a comprehensive range of functionalities and features including advanced managed file transfer, SLA monitoring, sensors and monitoring, reporting, infinite integration, and over 300 out-of-the-box integrations. These capabilities operate within a microservices architecture, which forms an integral part of the solution. This modern architecture provides a flexible system that ensures high availability and scalability. ANOW is available for on-premises, cloud-hosted, or SaaS deployment.

HCL: HCL Automation Orchestrator Suite is once again a Value Leader. The workload automation and orchestration part of this suite came to HCL when they partnered with IBM to take over the development of the IBM Workload Scheduler in 2016, so there is significant history and maturity with the core scheduling software. This comprehensive suite includes HCL Workload Automation, HCL Universal Orchestrator, HCL Clara, and HCL HERO, offering enterprise-level automation. HCL Workload Automation is a versatile platform orchestrating IT, operational, and business workflows in hybrid environments. Available as on-premises, cloud-hosted, or SaaS, it simplifies workload management. The Dynamic Workload Console consolidates control across deployments. The Automation Hub showcases advanced integrations with enterprise apps and cloud resources, providing over 100 out-of-the-box plugins for streamlined, standardized workload orchestration.

IBM: IBM is once again a Value Leader. IBM Workload Automation (IWA) is an enterprise platform that integrates IT, operational, and business workflows to manage unattended processes in hybrid environments. It enables planning, automation, and control of enterprise workloads available for distributed systems, IBM zSystems™, and as software as a service (SaaS). The interface allows easy modeling, management, and monitoring, featuring graphical views, analytics, and customizable dashboards. IWA supports various deployment models: on-premises, cloud, and SaaS. It orchestrates schedule-driven and event-driven workloads across applications and platforms, streamlining systems management. Containerized components are certified for Red Hat® OpenShift® and other Kubernetes platforms, ensuring smooth scalability. Embracing AI, IWA detects anomalies, enhances efficiency, and adheres to open standards (like Open Metrics and Open Telemetry) for compatibility with observability tools. IBM Workload Automation stands as a comprehensive, user-friendly solution aligned with evolving IT trends. Since partnering with HCL to develop the software products for DevOps, automation, and application modernization in 2016, IBM continues to evolve and advance IBM Workload Automation in conjunction with HCL.

Tidal by Redwood: Tidal by Redwood is once again a Value Leader. It presents a unified enterprise platform for comprehensive process automation across business, operations, and IT realms. It offers centralized control for intricate cross-platform, cross-application workloads in on-premises or cloud setups, supporting time-based, event-based, and dynamic processes. With a growing integration portfolio, Tidal orchestrates software and systems like JD Edwards, ensuring end-to-end process oversight. Developers can harness Tidal's full API to embed its automation prowess for streamlined continuous integration and development. The Tidal Repository streamlines change management for workload schedules, while Tidal APM Data Stream enhances operational insights by integrating operational data with a broad range of third-party solutions for data streaming and analytics (e.g., Kibana, Grafana, Prometheus) to enable a more holistic view of how business processes are performing. Redwood Software acquired Tidal Software in January 2023.

RunMyJobs by Redwood: Redwood Software's RunMyJobs (RMJ) is once again a Value Leader. RMJ was built to be offered as software as a service (SaaS) and is also available for on-premises installation. RMJ is a modern SaaS workload automation and orchestration solution that integrates with infrastructure, middleware, and applications to provide comprehensive automation for enterprises. It offers high scalability and can manage millions of critical process executions daily. Its lightweight architecture is easy to manage and update. The platform features a visual process editor and a library of integrations, templates, and wizards for efficient process creation, even for complex workflows. Single dashboard views offer end-to-end process visibility, and predictive SLA management alerts users about potential deadline delays. This enables proactive issue resolution before impacting the business. RunMyJobs optimizes performance, enhances agility, and empowers users by automating routine tasks, allowing them to focus on high-value projects that enhance competitiveness, customer experiences, and profitability.

Stonebranch: Stonebranch's Universal Automation Center (UAC) is a Value Leader, offering a suite of components including the Universal Controller (UC), Universal Agent (UA), Universal Data Mover (UDM), and Universal Data Mover Gateway (UDMG). It features event-driven automation, workflow orchestration, self-service automation with role-based access, infrastructure management, data pipeline automation, secure data transfers, and customizable analytics. This web-based solution facilitates real-time workload and process management based on enterprise events. Stonebranch's universal workload automation and orchestration is available as a service or on-premises, boasting vendor-agnostic agents that work across platforms, including mainframes and the cloud, with native managed file transfer capabilities.

Absyss: Absyss makes their debut in the EMA WLA Radar as Strong Value. Absyss VisualTOM is an automation platform focused on job scheduling and orchestration. It supports various environments, from on-premises data centers to hybrid and cloud. Its automation and orchestration capabilities provide centralized control over IT operations, enhancing execution security and efficiency and improving service quality for end users. The platform integrates and manages multiple applications and systems to coordinate IT and business tasks. It's compatible with various operating systems and interfaces with a wide range of applications and services, including ERPs, BI tools, databases, cloud services, and more. With graphical design capabilities, event-driven automation, monitoring, alerts, and a self-service portal, VisualTOM streamlines complex workflows. Additionally, its user-specific dashboards cater to both operational and business users, fostering informed decision-making. This comprehensive product enhances IT efficiency and bridges the gap between technical and business aspects. VisualTOM is sold as an on-premises solution by Absyss with SaaS options available through partners. Absyss plans to offer SaaS directly in 2025. Absyss was founded 1990 and remains privately owned with headquarters outside of Paris, France.

Rocket Software: Rocket Software® is once again Strong Value. Rocket's multi-platform workload automation and DevOps orchestration solution enables enterprises to reliably automate and orchestrate end-to-end development and operational processes across technology stacks, from mainframe to cloud. Rocket Enterprise Orchestrator is a superset of Rocket Zena and integrates with best-of-breed DevOps and CI/CD solutions. Enterprise Orchestrator enables infrastructure, operations, and DevOps teams to orchestrate end-to-end processes across multiple technology stacks, coordinating islands of automation and individual work items into a unified flow. This makes it possible to optimize business process flows, improve resource efficiency, and accelerate the delivery of innovation to end users and customers. The multi-platform enterprise workload automation and orchestration solution, Zena, enables operations teams to design, visualize, and automate IT processes and tasks to optimize operational business flows from mainframe to cloud. Rocket Zeke, a mainframe workload management and scheduling solution, features the ability to check for resources prior to task submission, system command scheduling, and automatic PARM calculation and substitution. Zeke has a direct integration with both Rocket Zena and Rocket Enterprise Orchestrator.

Honico: Honico makes their debut in the EMA Radar as Strong Value. Honico has two automation products: BatchMan and Easy Workload Scheduler. BatchMan enables process automation within SAP by operating in the ABAP stack, the core of SAP Systems, to manage both SAP and non-SAP processes. Because it runs inside of SAP, BatchMan is very cost-effective. It uses the same SAP environment and has little training time because it looks and works like SAP. It seamlessly integrates into existing setups without extra hardware or software. This workload automation and orchestration solution goes beyond traditional job scheduling, automating, and monitoring processes centrally within SAP. It covers connected SAP, non-SAP systems, and cloud applications, including S/4 and Rise with SAP. It employs SAP Roles for authorization management, offers native SAP system integration, and provides a single point of control and monitoring. Additionally, it supports integration with non-SAP systems and connection to SOAP services. Honico Systems GmbH is based in Hamburg, Germany. Honico was founded in 1999 and is privately owned.

Flux: Flux is a versatile cross-platform solution connecting enterprise applications, processes, and locations. Its Java-based system offers scheduling, file transfer, database integration, email, and web service coordination for intricate workflows. Since 2000, Flux has been pivotal in mission-critical applications across industries globally. It handles numerous daily tasks without add-ons, supporting diverse environments with secure file transfers, workflow execution, resource optimization, and issue alerts. Unique peer-to-peer architecture ensures scalability, failover, high availability, and load balancing. Flux excels in orchestrating managed file transfers, reducing errors through visual workflows, and automatic error handling. The user-friendly central console, intuitive designer, and script-free automation suit IT operations. Customizable for embedding, developers favor it. With reasonable pricing and straightforward licensing, Flux unifies applications, enhances transparency, and empowers users across all levels. Flux was founded in 2000 in Las Vegas, Nevada. Flux clients praise the company's customer service and the simplicity of the product.

Fortra: Fortra (formerly HelpSystems) is Strong Value in this year's WLA Radar. HelpSystems became Fortra in November 2022, signaling their focus on security offerings. Fortra continues to offer secure, centralized enterprise workload automation solutions to run, manage, and monitor critical batch processes. This suite of mature solutions supports jobs and workflows on all major platforms and applications and can be integrated with or embedded on Windows, Linux, and IBM i. Fortra's solutions unify job scheduling and workload automation across the entire IT infrastructure. Batch processes that typically consume a costly mix of resources to run across separate environments can be managed from a single command center. Centralized job management minimizes operational costs associated with keeping critical batch processes running efficiently. The cross-platform capabilities of Fortra's workload automation solutions enable organizations to extract maximum value from IT investments by creating business-focused workflows that span multiple platforms and applications, both on-premises and in the cloud.

SMA Software: SMA Technologies' OpCon is a cross-platform, event-driven workload automation and orchestration and digital automation platform. OpCon contains automation modules, including OpCon Deploy for change management and DevOps support, OpCon Vision for a high-level overview dashboard with SLA monitoring and automated corrective actions, and OpCon Self-Service so non-IT end users can see a simplified view of workloads important to them and monitor and trigger automated processes. OpCon includes lifecycle management, disaster recovery, and high-availability features. OpCon supports all major operating systems, as well as virtualized and cloud environments. Integrated file transfer support and file parsing allow files to be searched with specified information stored in variables. File information can be totaled, compared among files, and used for downstream processing. OpCon's graphical workflow designer allows all workflow properties to be set from a single point.

Vinzant Software: Vinzant's Global ECS provides graphical scheduling, automation, and control of complex job streams for multiple platforms in a heterogeneous, distributed production environment. It supports native agents for a wide range of distributed systems that can be managed from a single point, using either a Windows- or browser-based client. Global ECS includes user-definable recovery actions that enable built-in job logic to allow the production flow to self-correct. It also includes flexible exception management that allows for multiple methods of notification. Global ECS offers a simple deployment, with intuitive clients and a rich self-service capability via the web client. Users enjoy real-time interaction and management of live production queues, along with highly customizable real-time job and batch views. Vinzant Software was founded in 1987 in Hobart, Indiana, and is privately held. Vinzant did not provide updated information for this analysis. A review of publicly available information was used to update the 2019 WLA Radar data provided by Vinzant.

Arcana Development LLC

Arcana: Arcana adTempus is a job scheduling and process automation tool for Windows platforms, offering a wide range of features at a modest price. adTempus is easy to install, configure, and use, without the need for training classes. Jobs are constructed from various components (triggers, tasks, conditions, schedules, etc.) using property sheets and other GUI elements. adTempus can run any program, script, or batch file and has native support for tasks, such as file transfer, email processing, and database operations. Scripts can be used within adTempus to extend its capabilities, such as adding special condition checks or dynamically constructing command-line parameters for tasks. Jobs can be triggered based on schedules, file monitoring, email messages, event log events, WMI events, external process states, or through an API or command-line tools. Job or step execution can be made conditional on files, external processes, or other jobs, or scripts can be used to implement custom conditions. adTempus has a full-featured security model that integrates with Active Directory. Permissions are assigned to users and groups to determine which users have access to which jobs within adTempus, and what level of access they have (e.g., read only, modify, execute). Every job runs under a user's account, so system security is not compromised by allowing non-administrative users to schedule jobs. adTempus can be used on standalone servers or workstations and has "distributed scheduling" features that can be used to manage jobs on a central server and execute them on additional agent computers. In this configuration, it also supports job mirroring and load balancing. adTempus exposes a full API through .NET, allowing developers to automate job creation or integrate their applications with adTempus. adTempus is ideal for ISVs who need to include a robust scheduling engine as part of their solution.

Special Awards

Activeeon: Best MLOps Implementation

ProActive AI Orchestration (PAIO) is a comprehensive solution covering DataOps to MLOps, including Machine Learning Open Studio (MLOS) and an upcoming MLOps Dashboard. ActiveEon Studio simplifies data pipeline creation for all users, offering templates and reusable plugins. PAIO supports multiple languages, parallel execution, workflow control tools, error management, and job analytics. Ready-to-use templates and reusable plugins enhance customization. Jupyter integration and seamless data source connections enhance usability. PAIO provides a versatile solution for advanced AI orchestration with a focus on multiple user types including DataOps, data scientists, AI engineers, and DevOps. WLA is key to managing data pipelines, and it is logical to incorporate MLOps into the WLA processes and automate the creation, monitoring, development, and change processes within the WLA framework. While many products in the WLA market have extensive data pipeline capabilities (many of which support MLOps activities), Activeeon was the first to create a design studio and an end-to-end MLOps lifecycle focus and continues to lead in this area.

HCL: Best AI-Assisted Automation

HCL's Automation Orchestration Suite incorporates advanced AI capabilities to enhance IT, cloud, and business processes. It includes intelligent AI-powered assistants like Clara, HERO, and AI Data Advisor (AIDA). Clara is a virtual assistant offering personalized self-service solutions through natural language processing. It aids both IT operations and business users with tasks, recommendations, and how-to queries, enhancing the user experience. HERO optimizes HCL Workload Automation infrastructure using machine learning and big data, reducing manual efforts, server downtime, and improving IT operational efficiency. It combines centralized monitoring with Runbook automation, offering a clear, visually engaging dashboard for issue detection, root cause analysis, solution deployment, and even predicting potential problems using AI-powered trend estimation of KPIs. AI Data Advisor (AIDA) detects anomalies in workload execution using big data, AI, and machine learning intelligence. Users can dynamically manage critical jobs and their SLAs, predict scheduled job durations, simulate planned and unplanned events, and perform impact analysis on jobs and job streams.

Honico: Best Value for SAP Automation

BatchMan is a system designed for process automation within SAP environments, operating within the ABAP stack, which is the core of SAP systems. It offers flexible control over both SAP and non-SAP processes, seamlessly integrating into existing infrastructure without the need for additional hardware or software, making it very cost-effective if your primary goal is to automate SAP. BatchMan's workload automation goes beyond traditional job scheduling, offering centralized control and monitoring of SAP systems, non-SAP systems, and cloud applications directly from within SAP, including S/4 and Rise with SAP. It manages authorization through SAP roles, natively integrates with SAP systems, provides a single point of control and monitoring, and incorporates non-SAP systems. The product aligns with the goal of simplifying SAP IT operations amidst the ongoing digital transformation, where the complexity of SAP Basis responsibilities has grown due to the adoption of new technologies and the integration of diverse systems. This complexity is exacerbated by a shortage of skilled SAP Basis professionals, posing challenges for organizations navigating digital transformation. BatchMan aims to address these challenges by offering efficient, integrated workload automation and orchestration solutions tailored to SAP environments.

Future Outlook

Workload automation and orchestration is the future of this market. Not all products will make the transition to include orchestration and the need for traditional scheduling will continue independently for many organizations. However, the leading products are all making the move to increase orchestration capabilities and many enterprises are leveraging the capabilities to their benefit. The majority of enterprises do not yet know they will need to be on this journey, but more will start down the orchestration path in the next two years and DevOps will often be the starting point.

The next big move for WLA will come from artificial intelligence (AI) and machine learning (ML), since both are set to revolutionize workload automation and orchestration in the coming years. Many products have analytics capabilities currently and some include ML capabilities. AI has started to show up beyond analytics in limited ways in several products with some AI chatbot and other AI capabilities. This is just the beginning of what will come in the next two years. There will likely be several products with AI assisted low-code/no-code capabilities for defining automation parameters and logic. We could see integration tools augmented with AI as well. AI/ML will likely add significant capabilities to automated decisioning and auto-remediation features, as well as in analytics and automated actions surrounding automation performance and optimization. As AI and ML capabilities continue to evolve, WLA will become increasingly agile, self-optimizing, and responsive to the needs of organizations seeking to streamline their IT operations.

Overview

Control-M from BMC is once again a Value Leader and the overall highest-scoring product in this year's WLA Radar Report. Control-M (self-hosted) and BMC Helix Control-M (SaaS) offer a range of innovative features that streamline the creation, management, and monitoring of application and data workflows. A key strength lies in their ability to orchestrate end-to-end workflows across diverse hybrid and multi-cloud environments. Seamlessly integrating, automating, and orchestrating workflows across on-premises, public, and private clouds will ensure workflows and business services meet SLA deadlines consistently. Enterprise views empower companies to manage various workflows, including file transfers, applications, data sources, and infrastructure, facilitated by a rich set of integrations spanning AWS, Azure, GCP, and more. Provisioning in any cloud leverages cloud compute services' transient capabilities.

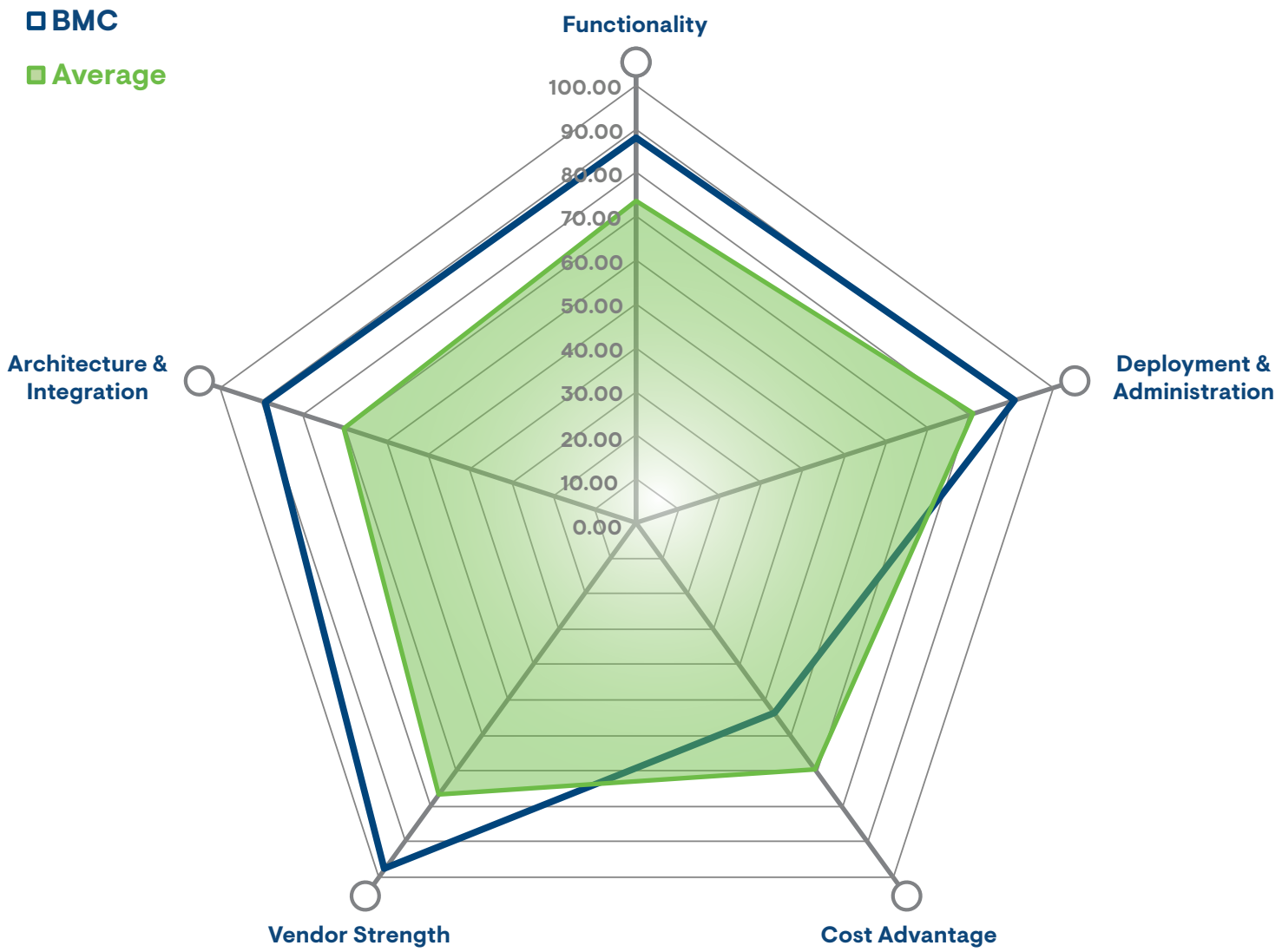
BMC brings an innovative and efficient approach to data pipeline orchestration. Navigating on-premises and cloud technologies, the platforms facilitate data pipeline creation, integration, and automation across platforms like Airflow and cloud services like AWS Lambda and Step Functions, Azure Logic Apps and Batch, and Google Cloud Dataflow and Cloud Functions. A vast (and rapidly expanding) catalog of out-of-the-box integrations simplifies data transfers in the context of data pipelines.

Utilizing a Jobs-as-Code strategy, these platforms seamlessly integrate into the DevOps toolchain, enabling developers and DevOps engineers to utilize REST APIs, JSON, and Python to create versionable, testable, and maintainable workflows in the CI/CD toolchain. This fosters collaboration and adaptability.

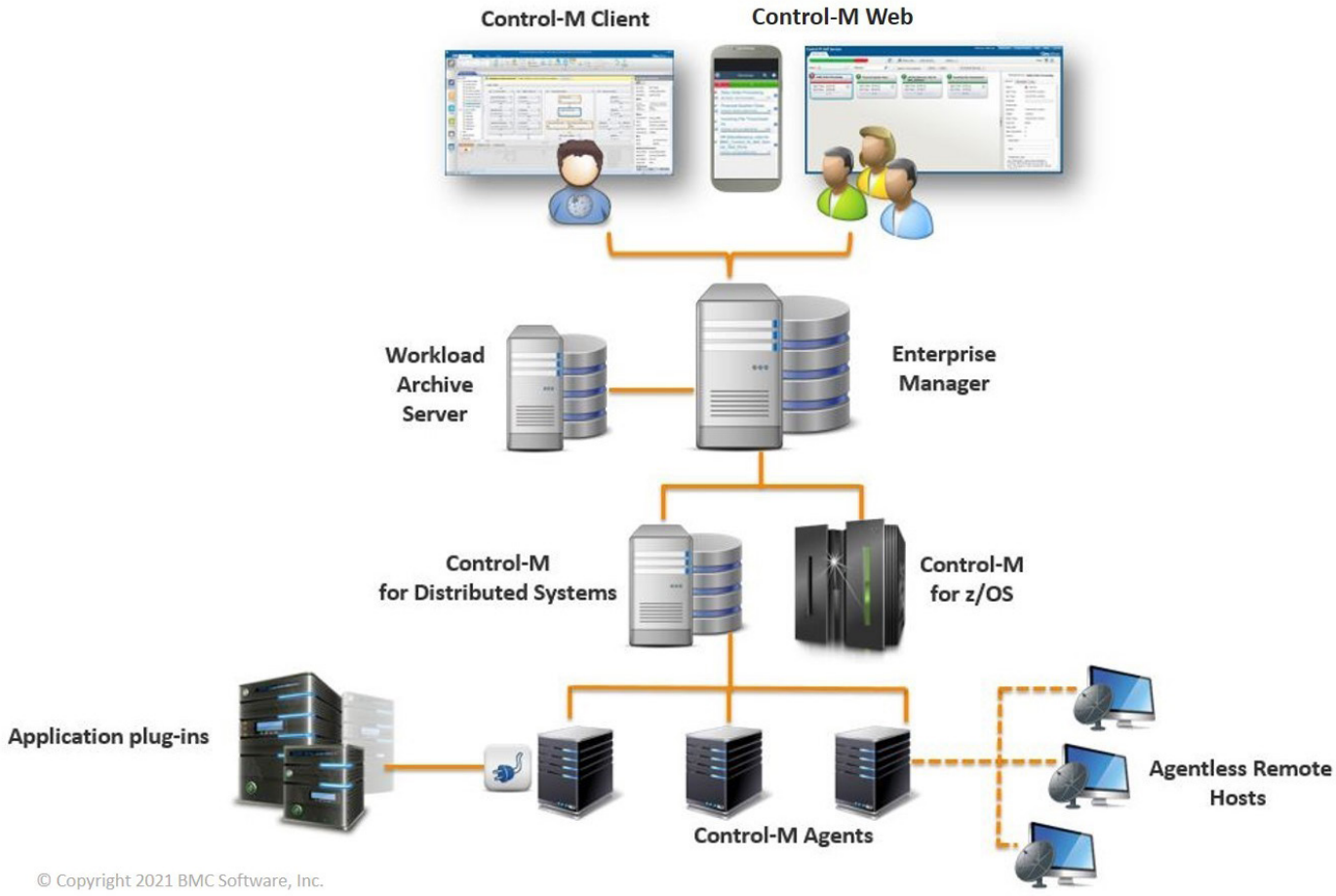
Both platforms uphold operational standards, and offer self-service interfaces for developers, data and cloud engineers, business users, and IT operations teams. Offering end-to-end workflow connectivity across applications, data sources, and systems of record, Control-M connects mainframe systems to cloud environments, ensuring seamless integration.

Self-service interfaces drive innovation across the organization, facilitating accelerated development and deployment of workflows. Predictive analytics aid SLA management, while auditing and comprehensive log and output management ensure compliance, governance, and efficient monitoring.

BMC is headquartered in Houston, Texas, and was founded in 1980. KKR acquired BMC from a group led by Bain Capital and Golden Gate Capital in 2018. Since going private, then changing hands to a new private equity firm, BMC enhanced its leadership ranks with many industry veterans. The current focus for Control-M and Helix Control-M centers around driving innovation through end-to-end orchestration across multiple clouds, simplifying and scaling data pipelines and supporting DevOps.

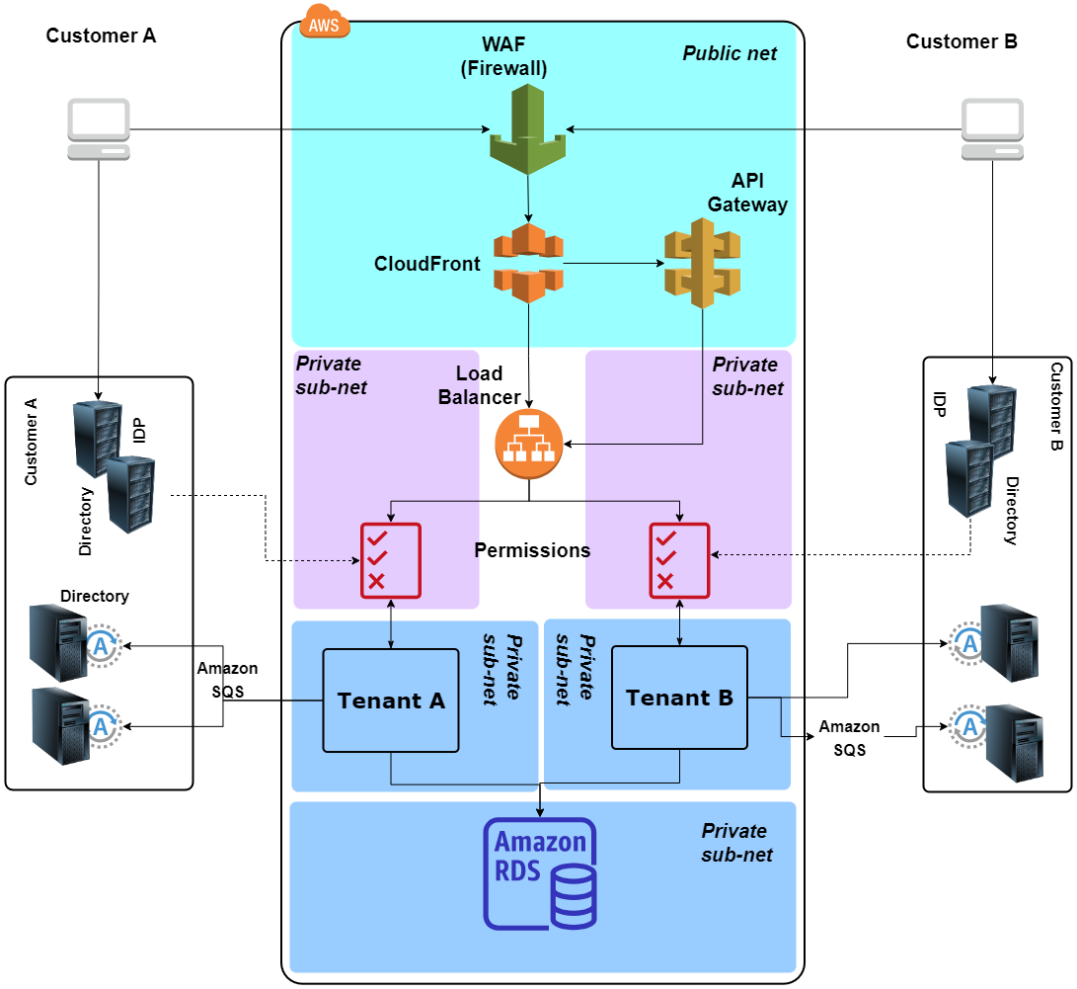

BMC
Average
Functionality
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Deployment & Administration
Cost Advantage
Vendor Strength
Architecture & Integration

Architecture



Control-M

Architecture



BMC Helix Control-M

Key Features Summary

Data Pipeline/DataOps

Control-M and BMC Helix Control-M are application and data workflow orchestration platforms that streamline data processing from raw data to actionable insights. They provide automation for complex application and data pipelines across hybrid and multi-cloud environments, managing data ingestion, storage, processing, and movement to analytics layers. The platforms work as unified control points, eliminating the need for multiple point solutions. Recent innovations include a Python client and Airflow integration for orchestrating data pipelines. They also integrate with major data ecosystem technologies and cloud services, enhancing visibility and efficiency across hybrid and multi-cloud environments.

Integrations

Control-M/Helix Control-M aid companies in orchestrating application and data workflows across evolving tech stacks and clouds. By regularly adding new integrations (over 40 in the last 18 months), the platforms cover diverse technologies like AWS, Azure, GCP, Docker, Airflow, SAP, and more. Application Integrator guides users to create custom job types for various applications, resulting in a unified view. With GitHub's integrations community, users can share and access crowd-sourced job types. This approach supports efficient delivery of digital services across on-premises and multi-cloud environments, with flexibility for users to create their own integrations.

Cloud

Control-M and Helix Control-M streamline application and data workflows across various cloud environments, including on-premises, private, public, hybrid and multiple clouds. Both platforms are cloud-provisionable, capitalizing on cloud-based ephemeral capabilities, simplifying hybrid cloud orchestration, and boosting scalability, speed, and agility. They support comprehensive orchestration of workflows, including file transfers, applications, data sources, and infrastructure, with rich integration sets. Features include hybrid cloud support; integration with AWS, Microsoft Azure, Google Cloud, and Oracle Cloud services; flexible configurations; and full functionality for advanced orchestration in the cloud. Helix Control-M is hosted on AWS.

Mainframe Modernization

Control-M assists companies transitioning mainframe applications and data to the cloud for improved business services and agility. Integration with AWS Mainframe Modernization Service (M2) supports migrating mainframe workloads to AWS. Google Dual Run enables concurrent workloads on existing mainframes and Google Cloud. The Micro Focus integration aids mainframe application modernization. Control-M is a reliable orchestration framework throughout this journey, bolstered by a supportive GOSI organization and partner network for comprehensive assistance.

Control-M Workflow Insights

Workflow Insights enhances IT teams' performance and risk management with analysis and visibility into workflow behavior through built-in dashboards and reports. It minimizes risk by identifying performance irregularities and errors early, reducing issue resolution time and optimizing ITOps efficiency. The feature offers comprehensive control and management, including constant telemetry and intelligent analysis on executing workflows, KPI tracking, and visibility into errors' impact on business services. Dashboards cover workflow health, trends, distribution, alerts, updates, SLA management, optimization, job executions, and user actions. Additional dashboards are regularly added based on customer feedback. Workflow Insights supports better decision-making for business service performance improvement.

File Transfers

Control-M/Helix Control-M Managed File Transfer (MFT) automate internal and external file transfers, enhancing efficiency and reducing risk. They integrate with application workflows, offering a single view of activity. Features include secure transfers with AWS, Azure, Google Cloud, and Oracle Cloud, automatic recovery, centralized configuration, built-in file transfer service, advanced capabilities like directory sync and search, and managed file transfer/enterprise capabilities. The MFT server supports secure transfers, limiting access via an allowed/blocked users list. MFT facilitates secure, efficient, and centralized file transfer management, enhancing data isolation, protection, and automation for business services.

Self-Service

Self-service capabilities include intuitive web and mobile interfaces displaying relevant business services, real-time job status, and operational actions like hold, skip, rerun, and kill. The Python client and Airflow integration assist data professionals. Developers benefit from Automation API, Workbench, and Workload Change Manager. Additional self-help resources, including webinars and demos based on customer feedback, enhance user understanding. Self-service access empowers users while maintaining a secure orchestration framework with permissions and controls.

DevOps Collaboration

Enables DevOps innovation by integrating workflow automation and orchestration. Using the Automation API, developers can embed Jobs-as-Code within the application release process. This versionable, testable, and maintainable approach fosters collaboration between developers and DevOps engineers. Workbench offers a dedicated development environment for coding, debugging, and testing job flows. Workload Change Manager streamlines Dev and Ops collaboration, promoting workflows across stages while adhering to predefined enterprise standards. These features facilitate application workflow integration and automation within complex hybrid environments.

Non-Production Environments

To support digital transformation initiatives, non-production environments are crucial for testing and debugging workflows before deployment. Control-M Workbench provides developers with a standalone environment to code, debug, and test job flows using JSON or Python. Workbench is available on Docker Hub and supports various operating systems. It bridges development and operations, allowing creation of automation for production. Similarly, Helix Control-M offers a sandbox environment for developers and data teams to code and test job flows without affecting production, ensuring smooth deployment.

Innovation Acceleration

BMC is expediting innovation releases to assist customers in adopting new features quickly. Releases are also date-driven providing customers with the ability to better plan and prepare for upgrades. This applies to Control-M, Helix Control-M, Integrations, Python client, Automation API, Workbench, and Conversion Tool.

Evaluation Summary

Deployment & Administration	
Ease of Deployment	
Deployment Time/Effort	Outstanding
Conversion Facilities	Strong
Job Discovery and Import	Outstanding
Staff Training	Outstanding
Support & Services	
Customer Support	Strong
Professional Services	Outstanding
Ease of Administration	
Console Ease of Use	Strong
Upgrade Process	Strong
Test Environments	Outstanding
Automation of Management	Outstanding

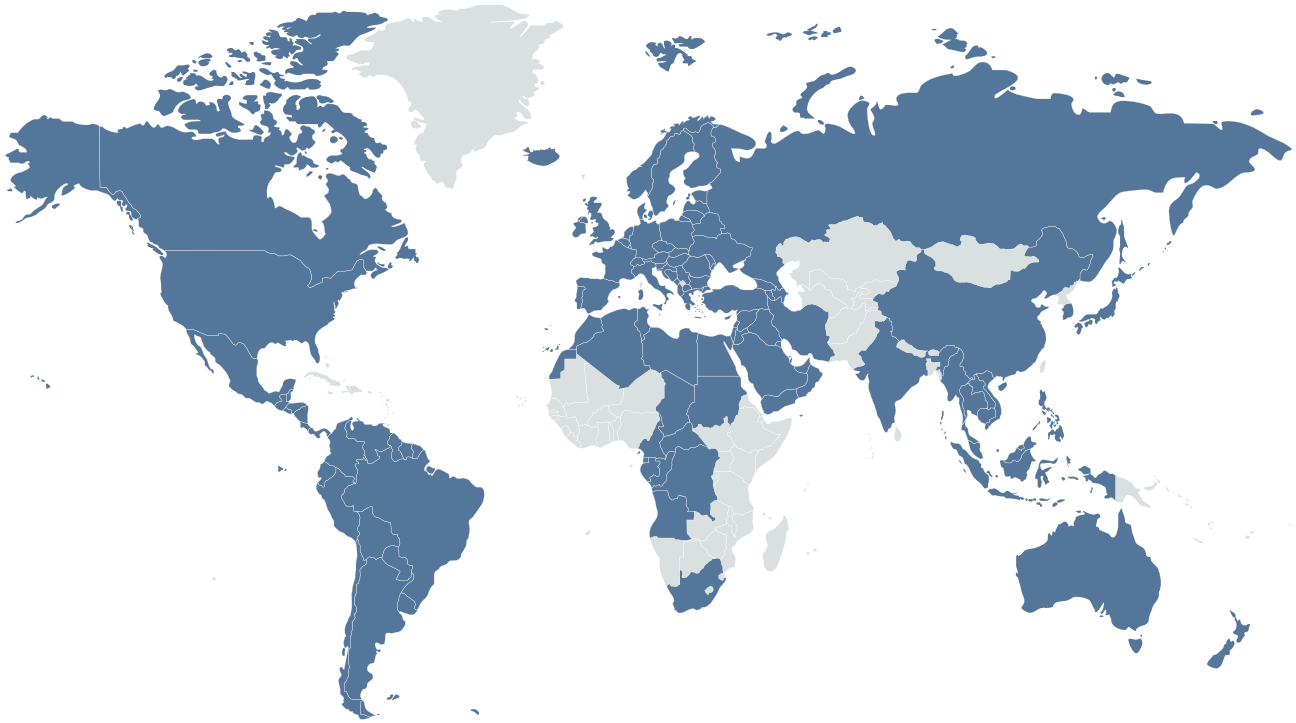
Cost Advantage	
Flexibility of Pricing Model	Outstanding
Pricing Scenarios	$$$$$
SaaS Availability	Strong

Architecture & Integration	
Architecture	
Business Focus	Outstanding
Scalability	Outstanding
Dynamic Workload Placement	Strong
Breadth of Platform Support (including agentless)	Outstanding
Breadth of Application & Database Support	Outstanding
Disaster Protection	Outstanding
Containerized Workloads	Outstanding
Container Deployment	Outstanding
Mainframe Support	Outstanding
Shared Server/Multi-Team Support	Strong
Integration & Interoperability	
Comprehensive API	Outstanding
Cloud Integration	Outstanding
CMDB Integration	Outstanding
ITPA Integration	Outstanding
Infrastructure Configuration and Observability	Outstanding
MFT Integration	Outstanding
Data Pipeline Integration	Outstanding
Communication/Collaboration Integration	Strong
Heterogeneity Across Environments	Strong
DevOps Support	Outstanding
MLOps Support	Strong

Functionality	
Features	
Automation Design Flexibility	Strong
End-to-End Monitoring	Outstanding
Compliance Management	Outstanding
Triggering	Strong
Self-Service Portal	Outstanding
Forecasting, Analytics, Reporting	Outstanding
Alerting	Strong
Security	Strong
What-If Scenarios	Strong
Conditional Logic and Auto-Remediation	Outstanding
Logging and Auditability	Outstanding
Business User Features	Strong
Big Data Support	Outstanding
RPA Orchestration	Solid
Ease of Use	
Simplicity of GUI	Outstanding
SLA and Policy Awareness	Outstanding
Root Cause Analysis	Outstanding
Mobile Device Support	Strong
Language Support	Outstanding
Available Help Resources	Outstanding

Vendor Strength	
Vision	Outstanding
Strategy	Outstanding
Financial Strength	Outstanding
Research and Development	Outstanding
Partnerships and Channel	Outstanding
Market Credibility	Outstanding
Geographic Coverage	Outstanding

Active Clients



Product Available In:

English, French, German, Chinese, Japanese, Korean, Hebrew

Number of Customers:

+

= 100 = 1000

Favorite Features From Customer Interviews

I am the Control-M evangelist because of the flexibility of integration.

My favorite feature is Dependency Management because you can just drag and drop lines between jobs.

My team appreciates the ability to create custom integrations and plug-ins using the Application Integrator.

They really improved the UI, and it is great from a management oversight perspective.

Having a single-pane-of-glass view is my favorite aspect of Control-M.

Their commitment to innovation and R&D is impressive.

I enjoy the calendar flexibility—we run over 125 calendars.

Jobs-as-Code changed our entire mindset.

We really like the agentless capabilities!

I like the mass update and mass creation capabilities within Workload Change Manager.

BMC listens to customer feedback and takes action on negative feedback—they seem to be egoless and just want to make the product better.

Control-M is one of the most stable things I run. I don't lose sleep over Control-M, and that is my favorite thing.

Appendix A

Measurement Criteria

Research for the 2023 WLA Radar took place starting in Q2 2023. Vendor input is included in the process of updating the measurement criteria. For the 2023 report, significant changes to the measurement criteria were made to both Architecture & Integration and Features to capture the significant changes in workload automation and orchestration in support of application modernization and digital transformation trends.

EMA used the following requirements to evaluate the participating vendors. Please keep in mind that these categories were weighted differently depending on their importance to a business-driven WLA solution. Highlights reflect new measurement criteria for 2023. In addition to new criteria, the weighting assigned to various criteria were adjusted to reflect new trends in the marketplace and give less importance to criteria where there is less differentiation among vendors.

Model Weighting Changes and Additional Measures for 2023

- Within Architecture
  - Increased the weight of Cloud Integration.
- Within Integration/Interoperability
  - Capacity Management Integration was changed to Infrastructure Configuration, Observability, Capacity Management and the weight was increased.
  - Big Data Support was changed to Data Pipeline Integration.
  - Social Media Integration was changed to Communication/Collaboration Integration.
  - MFT Integration increased in weight.
  - MLOps decreased in weight.
- Within Features
  - Triggering increased in weight.
  - Self-service increased in weight.
  - Alerting increased in weight.
  - Business User Features increased in weight.
  - Hadoop Support was changed to Data Pipeline Management.

Architecture & Integration	
Architecture	
Business Focus	Includes measures about dashboards (including expanded role-specific dashboard views), reports, triggers, prerequisites, service catalog integration, auto-discovery, SLA awareness, role-based security, single sign-on support, business impact analysis, AI-based predictive scheduling, AI-based anomaly detection, role-specific AI-based chat bots, and others.
Scalability	Includes measures about number of endpoints, size of active deployments, hardware required for specific workloads, support for virtualized and cloud environments, maximum jobs for a single installation, load balancing, autoscaling scenarios, endpoint load balancing, and others. For 2023, all job-based scalability metrics were increased by several million jobs.
Dynamic Workload Placement	Includes measures about SLA-driven thresholds, business impact analysis, workload placement factors (e.g., utilization, performance, policies, compliance issues, etc.), cloud support, cloud compute resource services, cost of workload placement, multiple endpoints, resource contention, time-based factors, balanced capacity strategy, active/passive failover, and others.
Breadth of Platform Support (incl. agentless)	Operating systems supported.
Breadth of Application & Database Support	Common business applications and databases supported including new SAP options and public cloud data management services.
Disaster Protection	Includes measures about fault tolerance, high availability, failover, automated job rerun, manual job rerun, mid-job restart, auto-remediation, alternate schedules, agent self-healing, dynamic memory reassignment, multi-CPE with load balancing, and others.
Containerized Workloads	Measures the ability to manage container-based workloads, Docker support, and in conjunction with Kubernetes, agents in application containers and applications in agent containers. Expanded to include Kubernetes integration and cloud services.
Container Deployment	Measures the ability to deploy the WLA product within a container and in conjunction with Kubernetes, as well as a container image for agents included out of the box. Multiple container deployment options are measured, as well as the ability for each option to support Kubernetes. Expanded to include Kubernetes integration and cloud services.
Mainframe Support	Mainframe support was broken out separately and multiple new mainframe support metrics were added, including native CPI on mainframe, distributed CPE on single LPAR, distributed CPE with agents across a Sysplex, etc. Includes mainframe migration services and mainframe optimization/load balancing for jobs.
Shared Server/Multi-Team Support	Team collaboration capabilities, such as domains or tenants to organize jobs by business groups involved/impacted, advanced version controls, dynamic version comparison, check-in/check-out per group, version rollback, folders, etc. Also includes external version and code controls and enhanced API capabilities beyond the GUI.

Architecture & Integration	
Integration/Interoperability	
Comprehensive API	Includes measures about exposed scheduler elements for job stream objects, performance metrics, and supported API standards, such as JAVA RMI, SOAP, REST, etc. Also includes the ability to use AI-based chat bot to assist in coding integrations.
Cloud Integration	Includes measures about dynamic placement in the cloud, cloud compute resource services supported, and specific public clouds supported.
CMDB Integration	Includes measures about CMDBs supported and extent of support.
ITPA Integration	Includes measures about built-in, companion, and third-party process automation features and products supported.
Infrastructure Configuration, Observability, Capacity Management (formerly Capacity Management)	Infrastructure Configuration with integration to tools such as Ansible, Terraform, etc. Observability platform integration including tools like Grafana, Dynatrace, etc. Capacity Management with measures about creating, reconfiguring, or decommissioning virtual machines, shifting workloads, dynamic public cloud resource allocation, Kubernetes integration, and ensuring performance based on SLAs.
MFT Integration	Includes measures about file transfer capabilities supported natively, integration with third-party file transfer products, and file transfer features supported, including triggers, protocols, data manipulation, etc. Also includes message queues and public cloud protocols (Google Cloud Storage Bucket, Azure Data Lake Gen 2, etc.) to the list of capabilities. Native capabilities include encryption at rest, IP address blocking, automatic onboarding of external users, etc. Supported third-party products are specifically listed.
Data Pipeline Integration (formerly Big Data Support)	Specific products and Hadoop ecosystem components integrated out of the box. Expanded list of ETL, big data/NoSQL, and BI/analytics/ML products supported natively.
Communication/Collaboration Integration (formerly Social Media Integration)	Specific communication/collaboration platforms (WhatsApp, Telegram, Teams, Slack, etc.) and social media (Twitter, LinkedIn, etc.) platforms supported out of the box.
Heterogeneity Across Environments	Includes awareness of and interaction with other schedulers, integration with companion and third-party infrastructure monitoring tools, business application monitoring tools, alerting tools, and ITSM tools. Also involves discovering dependencies across different schedulers, between jobs and underlying infrastructure, and across business units. Expanded to include environment-specific schedulers with native support and orchestration capabilities for other enterprise-class WLA products.
DevOps	Includes capabilities to define job scheduling and job definition artifacts in code-like notation, store them in software configuration management tools with the code, etc. (Jobs as Code). Also includes DevOps integration through import/export capabilities; granularity of import/export operations at job, job stream, team, domain, agent levels, etc.; and breadth of API coverage, local commits, source code control tools supported, CI/CD tools supported, etc. Expanded for external version control capabilities, external code repositories, supported data serialization formations (JSON, YAML, etc.), and updated lists for CI/CD tools.
MLOps	MLOps is DevOps for machine learning. It includes the act of handling data to develop, train, test, and monitor for data drift, etc., along with support for data science notebooks and the change management processes to update ML models over time. Expanded list of data science notebooks supported and added supported data serialization formations (JSON, YAML, etc.).

Functionality	
Features	
Automation Design Flexibility	Includes measures about automation construct types for job/task, listeners/watchers, monitors/sensors, resources, events, folders and definition organization, logic, nesting, etc. Also added resource dependencies, logical operators to group and structure dependencies, multi-dependency logic trees, and site standards.
End-to-End Monitoring	Includes measures about dashboard views for job stream performance across all environments, real-time performance by business unit, historical performance, performance against SLAs, and overview (e.g., jobs on time, about to be late, late, and failed). Expanded types of job and SLA data included on dashboards, as well as intended dashboard user types.
Compliance Management	Includes measures about templates for specific compliance standards (e.g., HIPAA, SOX, or PCI), custom compliance policies, real-time compliance monitoring, compliance-aware job placement, and standard compliance reporting.
Triggering	Includes measures about available triggers (e.g., calendar, events, dependencies, file actions, message queue, email events, applications, databases, SNMP traps, etc.), message queues supported, types of calendars supported, multiple conditions, conditional logic, and priorities. Includes integration with Slack, Microsoft Teams, and ServiceNow. Expanded message queue and file triggers.
Self-Service Portal	Includes measures about capabilities provided to business users, such as triggering; editing; defining; viewing status; restarting jobs, job streams, or automated processes; dashboard views; and mobile device support.
Forecasting, Analytics, & Reporting	Includes measures about native and third-party predictive analytics, warning thresholds, critical path views, past job performance, decision heuristics, graphical job dependency views, modeling of new jobs, historic performance reporting, GANTT and PERT charts, event capture, SLA impacts, job processing costs, and others.
Alerting	Includes measures about means of alerting (e.g., SNMP, email, text, etc.), alert priorities, customization of notifications, routing rules, and others.
Security	Includes measures about security roles, role-based access, dynamic privileges, record-level access controls, namespace controls, secure communications between CPE and agents, enforced naming standards across environments, and others. Expanded to include mainframe-specific security, new authentication protocols, supported privileged access and identity products, and architectural separation for multi-tenant users.
What-If Scenarios	Includes measures about simulating the effects of new job streams on existing jobs, new job streams on SLAs, and performance of jobs under development. Expanded to include impact of logical resource changes and variable resolution changes.
Conditional Logic & Auto Remediation	Includes measures about automatic issue resolution; remediation based on events, historic data, or predictive; and others. Includes AI-based predictive scheduling and anomaly detection and AI-based chat bot to assist operators and business users.
Logging/Auditability	Includes measures about activities logged including user interactions, job statuses, errors, result logs, schedule changes, logins and logouts, resource contentions, job stream performance, and others.
Business User Features	Capabilities for non-technical users including dashboard features, such as reporting, planned vs. actual outcomes, job lifecycle management, monitoring, etc.
Data Pipeline Management (formerly Hadoop Support)	Includes support for various Hadoop distributions and Hadoop Ecosystem integrations, as well as broader support for DataOps/data pipeline orchestration.
RPA Orchestration	Specific product integrations supported out of the box.

Functionality	
Ease of Use	
Simplicity of GUI	Includes measures about GUI elements, graphical wizards (e.g., creating jobs, dependencies, deploying agents, creating reports, defining job priorities, defining SLAs, defining auto-remediation sequences, etc.), web-based aspects of UI, dashboard customizations, and others. Expanded dashboard customizations for MFT, workload performance, configuration, and application integration tool.
SLA & Policy Awareness	Includes measures about SLA awareness, monitoring, proactive notification, automated actions triggered by SLAs at risk, reporting, etc.
Root Cause Analysis	Includes measures about diagnostic information collected including error messages, active processes, instructions at time of failure, open files, file operations at time of failure, performance metrics, resource availability, and others.
Mobile Device Support	Includes measures about mobile environments supported (e.g., iOS, Android, Windows) and the UI features supported on each environment.
Language Support	Measures the number of languages supported.
Available Help Resources	Includes measures about online knowledgebase, videos, online training, and others. Options added for searchable online database of known issues, user-contributed community, and notification options.

Deployment & Administration	
Ease of Deployment	
Deployment Time/Effort	Includes measures about deployment options, trials, training, proof of concept, installers, high-availability setup, install services, and automatic provisioning, including databases.
Conversion Facilities	Includes measures about conversion tools for CRON, VBScript, PowerShell, and specific vendor products, including all those in this report. Expanded to include cloud environment-specific schedulers.
Job Discovery & Import	Includes measures about auto-discovery of jobs, job dependencies, job streams, schedule files, resources, variables, event actions, notification, self-service items, etc.
Staff Training	Includes measures about available training onsite, via video, interactive tutorials, etc., as well as knowledgebase, certification programs, and technical events.
Support and Services	
Customer Support	Includes measures about support hours and means of support (e.g., phone, email, chat), forums, knowledgebase, help functions, online manuals, automation as a service (AaaS), dedicated customer success manager, etc.
Professional Services	Includes measures about direct services supported including report creation, system configuration, business planning, prototype creation, custom scripting, online training, videos, on-location training, etc.

Deployment & Administration	
Ease of Administration	
Console Ease of Use	Includes measures about console design, features, web and mobile support, multi-level decision trees, business views, functional-level security scoping, migrations, advanced import/export, and others.
Upgrade Process	Includes measures about maintenance windows, wizards, test and development environments, agent change management, rollback for agents, console, UI, upgrades with no interruption to working users/processes, length of support for previous releases, and others.
Test Environments Included	Availability within the production install.
Automation of Management	Includes measures about automated collection of diagnostic information, automated alert management, multiple means of auto-remediation and automated actions, failover, automated database backup, and other automated management features. Expanded to include AI/knowledge-based administration functions from add-on products including AI-powered anomaly detection, proactive alerts, and chat bot interactions.

Cost Advantage	
Flexibility of Licensing Model	Includes measures about pricing options including by job, MIPS, sockets, cores, concurrent jobs, enterprise license, etc., as well as mixing license types.
Pricing	Several configurations were considered and pricing was compared across all vendors. Several newer configurations were added to reflect modern use cases, including more detailed SaaS configurations.
SaaS Availability	SaaS offering details like multi-tenant vs. multi-instance, VPN and port considerations, agent connection, interacting with on-premises workloads, cloud vendors and regions supported, client choice of cloud, SaaS SLAs, SaaS Service Catalog coverage, etc. Added Oracle and SAP Cloud options and increased the granularity of uptime support between 99% and 99.99%.

Vendor Strength	
Vision	How the vendor views the market and the direction they are taking their product.
Strategy	How the vendor approaches the market and positions their product.
Financial Strength	A light look at overall financial strength (where available).
Research & Development	Budget allocations for development teams in comparison to revenues and the number and frequency of new features.
Partnerships/Channel	Number and types of partnerships, channels, and ecosystems created.
Market Credibility	General sense of position and reputation in the marketplace.
Geographic Coverage	A review of countries with direct sales, channel sales, and deployed customers, as well as languages supported.

About Enterprise Management Associates, Inc.

Founded in 1996, Enterprise Management Associates (EMA) is a leading industry analyst firm that provides deep insight across the full spectrum of IT and data management technologies. EMA analysts leverage a unique combination of practical experience, insight into industry best practices, and in-depth knowledge of current and planned vendor solutions to help EMA's clients achieve their goals. Learn more about EMA research, analysis, and consulting services for enterprise line of business users, IT professionals, and IT vendors at **www.enterprisemanagement.com**. You can also follow EMA on **Twitter** or **LinkedIn**.

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2770 Arapahoe Road, Ste 132 - 544, Lafayette, CO 80026 +1 303.543.9500 **www.enterprisemanagement.com**

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