SAP and Cisco Automate Deployment with Application Centric Infrastructure

SAP, Cisco, and Vnomic are collaborating to dramatically accelerate and simplify the deployment and operation of large-scale SAP applications by using Cisco® Application Centric Infrastructure (Cisco ACI™), including the Cisco Application Policy Infrastructure Controller (APIC), the Cisco ACI family of programmable switches, and the Vnomic Declarative Application Delivery and Governance Platform.

Challenges

The growing sophistication and deployment complexity of next-generation application landscapes mean that traditional approaches to application deployment and management no longer meet business expectations. In a competitive world, customers must deploy services quickly, then rapidly and safely add or remove resources from already running applications to meet the demands of users, based on service-level requirements, time scheduling, and cost factors, while adhering to the security and governance requirements.

SAP BW/HANA landscapes possess all the attributes of complex, dynamic applications that can benefit from Cisco ACI. These include distributed users, 24x7 global availability, highly variable performance and scale demands, virtual and physical resource requirements, various types of storage, and changing security and governance requirements. It can take weeks or months to provision, deploy, and configure these landscapes, and doing so involves manual layout of new infrastructure, connectivity, and configuration of Layer 4 through 7 services, with the potential for errors further slowing deployment cycles. This leads to rigid IT environments, limiting customers' agility in responding to variable business demands.

Solution Overview

SAP BW/HANA landscapes consist of multiple application components across a multitier topology, with detailed requirements for how those tiers communicate. The data center network must be configured to enable this complex communication while still meeting business needs for security, compliance, and service levels. Any changes to a tier, such as supporting increased demand, often require extensive configuration changes to the network devices.

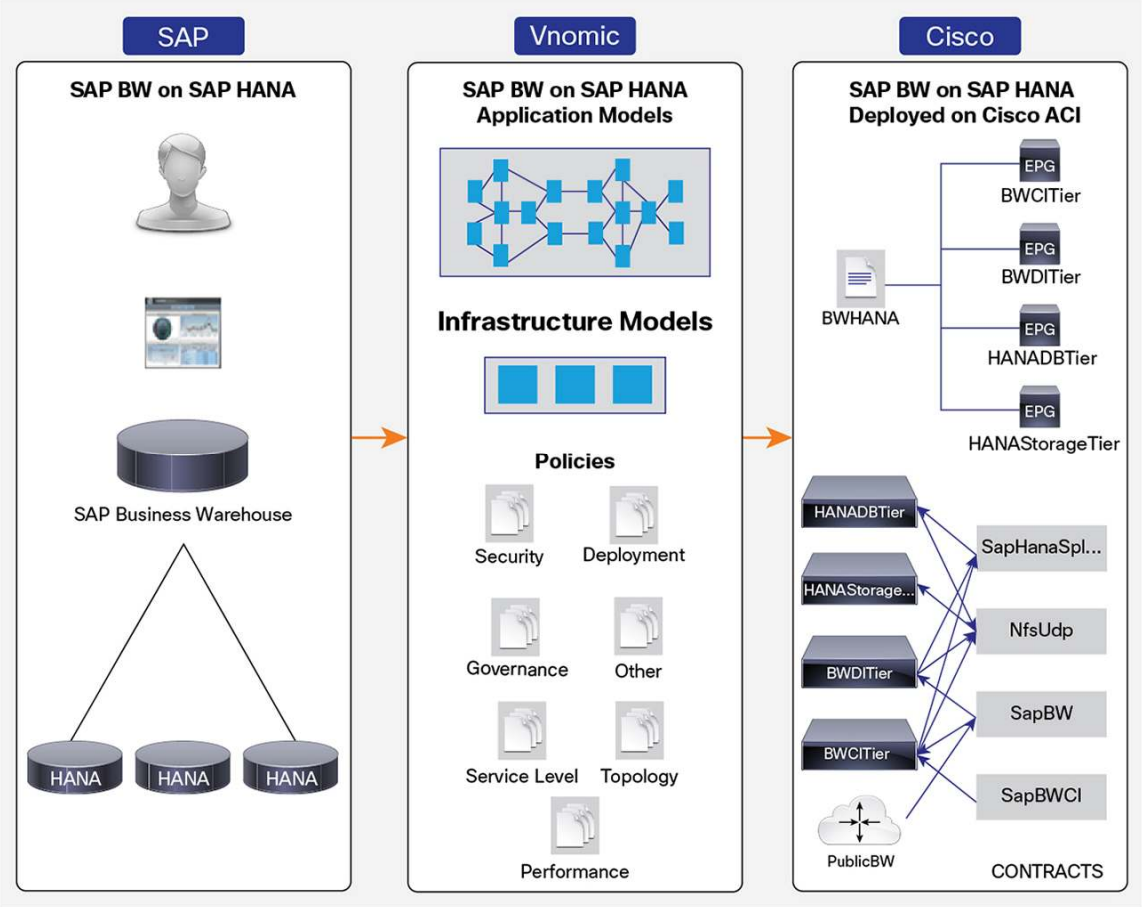
SAP and Vnomic used the Vnomic Modeling Framework to declaratively describe all the components and services and their interrelationships that make up SAP BW/HANA landscapes. Using the Vnomic Service Designer, they architected the components into an infrastructure-independent application service model representing suitable deployment topologies required in the SAP BW/HANA landscapes (Figure 1).

Cisco ACI provides the critical framework that enables the complex communication requirements of SAP BW on SAP HANA to be implemented in real-world network installations. It provides:

- A declarative model to provision and control the network through policy, eliminating the need for special state-dependent logic and sequencing during orchestration.

- A set of application-centric abstractions, including application components, contexts, endpoints, and contracts. Since these abstractions exist in both the application and network domains, the required semantics are fully communicated and thus upheld by the fabric.

Figure 1. Application Service Model for SAP BW/HANA Landscapes



The joint solution brings together SAP BW on SAP HANA, the Vnomic Declarative Application Delivery and Governance Platform, and Cisco ACI to simplify and accelerate the deployment of SAP BW on SAP HANA.

Solution Components

SAP BW Powered by SAP HANA

The reporting, analysis, and interpretation of business data is of central importance to a company in guaranteeing its competitive edge, optimizing its processes, and enabling it to react quickly and in line with the market. To achieve these goals, the SAP Business Information Warehouse (SAP BW) provides a business intelligence platform, data warehousing functionality, and a suite of business intelligence. It captures, stores, and consolidates vital customer information with the enterprise data warehouse platform. It also allows customers, in real time, to tightly integrate warehousing capabilities for a single version of the truth, decision-ready business intelligence, and accelerated operations.

SAP HANA combines database, data processing, and application platform capabilities in memory, with unparalleled performance. This new architecture enables converged online transaction processing (OLTP) and online analytical processing (OLAP) within a single in-memory column-based data store with ACID compliance,[1] while eliminating data redundancy and latency. The SAP HANA platform provides libraries for predictive analytics, planning, text analytics, spatial processing, and business analytics. By providing such advanced capabilities, all on the same architecture, it further simplifies application development and processing across big data sources and structures. This makes SAP HANA the most suitable platform for building and deploying next-generation, real-time applications and analytics.

SAP BW/HANA landscapes consist of multiple application components across a multitier topology. SAP BW is deployed as a horizontally scalable application server tier with a coordinator node, which share configuration storage with specific compute, network, and storage requirements. SAP HANA is a highly scalable in-memory database deployed as a multinode cluster with specific requirements for high-performance processor, network connectivity and performance, large memory, and cluster shared state with specific storage.

Vnomic Automation

Declarative deployment is a recent technical breakthrough, tying the power of application modeling to the flexibility of programmable infrastructure.

The Vnomic Declarative Application Delivery and Governance Platform is an application-centric automation solution capable of controlling the most sophisticated applications and infrastructures. The Vnomic Modeling Framework allows users to concisely express application components, their dependencies and interrelationships and infrastructure requirements, as application building blocks. The Vnomic Service Designer allows service architects to snap together building blocks into error-free application service models that describe sophisticated application landscapes, independent of infrastructure. Policies are used to expose and configure customization points.

Cisco ACI

Cisco's vision for ACI is to deploy and optimize complex, dynamic applications with exceptional agility and simplicity in enterprise data centers. It provides flexible application policy and infrastructure control that can dramatically accelerate application deployment and operations through centralized configuration, testing, and monitoring of the entire data center infrastructure, including network connectivity, security, and other Layer 4 through 7 services.

Cisco APIC application network profiles uniquely capture application connectivity and governance requirements in terms of application abstractions, including application components, endpoints, and contracts, effectively bridging the traditional semantic gap between application requirements and network implementation. APIC uses a logical representation of application requirements to automatically provision and continuously adapt the fabric for optimized application operation.

[1] The atomicity, consistency, isolation, and durability (me]] it re Specialized Partners, we should use the actual specialization nameACID) model, a fundamental concept of database theory, helps ensure reliability: http://www.saphana.com/docs/DOC-2443.

Integration: SAP BW on SAP HANA, Vnomic Declarative Deployment and Governance Platform, and Cisco ACI

The Cisco ACI integration consisted of Vnomic adding a plug-in to programmatically build ACI application network profiles from Vnomic application service models and programming them into the Cisco APIC using the APIC API. The preliminary integration was complete in only one week, which would not have been possible without the well-designed abstractions provided by ACI.

When an application is deployed, customers need to configure the application so that it meets the communication requirements. For example, between the HANA tier and the storage tier there are multiple connections, each with specific requirements for performance, security, and quality of service. The Vnomic Desired State Controller (DSC) computes a Cisco ACI application network profile that assigns a unique endpoint group for each tier (Figure 2). Defining the connection characteristics between each of the endpoint groups, in terms of application requirements, is easily done using ACI contracts. Applications can now consume the resources, virtual or physical, that best fit their needs, independent of location. Because all application characteristics are fully specified, compliance is provided across any changes in an agile environment (Figure 3). It is these important application-centric features that make ACI unique.

Figure 2. Vnomic DSC Computes the Application Network Profile for the Deployment Topology

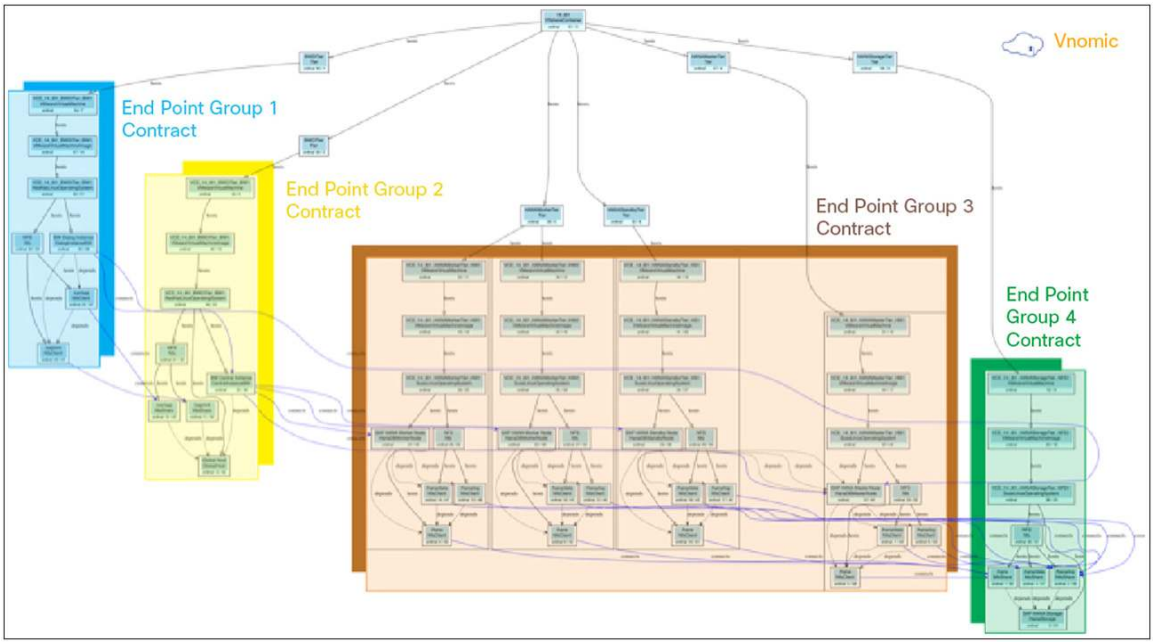
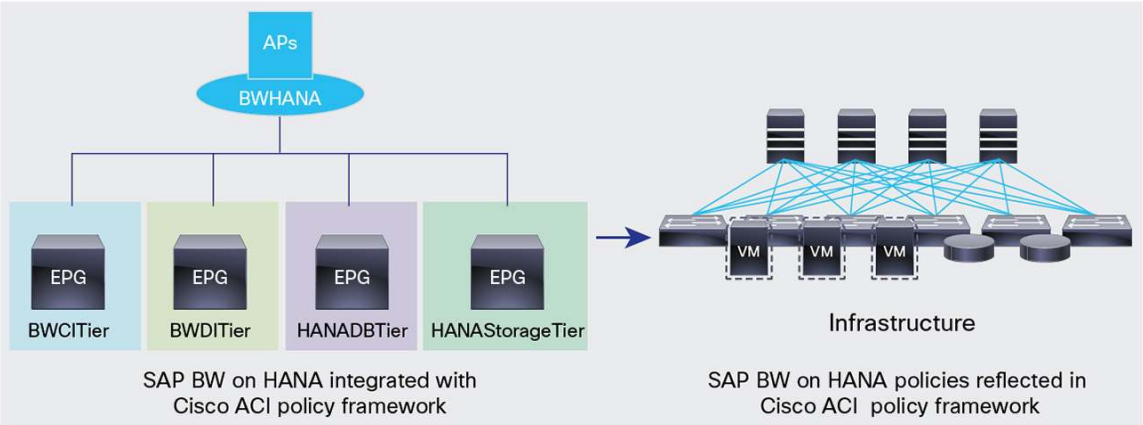


Figure 3. Direct Integration with the Cisco ACI Policy Framework



Customer Benefits

By taking advantage of the power of Cisco ACI and Vnomic Declarative Deployment and Governance, SAP can deploy a complete SAP BW/HANA solution in hours with no manual errors. ACI effectively removes the traditional semantic gap between application requirements and network implementation. This results in order-of-magnitude faster deployment and operational control of dynamic applications:

- Faster deployment and change velocity for sophisticated applications
- Elimination of complex, error-prone processes
- Alignment of network behavior with application requirements
- Continuous assurance of security and compliance

Conclusion

SAP's and Vnomic's work with Cisco APIC is a compelling validation of the transformational power of the Cisco Application Centric Infrastructure. The joint integration of application policy and infrastructure control with SAP BW powered by SAP HANA will dramatically accelerate application deployment and the optimization of application operational behavior.

About Cisco

Cisco (NASDAQ: CSCO) is the worldwide leader in IT that helps companies seize the opportunities of tomorrow by proving that amazing things can happen when you connect the previously unconnected. One of Cisco's key differentiators has been our ability to capture market transitions which drive innovation that enables our customers' long-term success. At the heart of these transitions - cloud, mobility, video, any device and social - is the network. Cisco's vision is to become our customers' most strategic business partner by delivering intelligent networks and technology and business architectures built on integrated products, services, and software platforms which enable our customers' success. Cisco has shaped the future of the Internet by creating unprecedented value and opportunity for our customers and ecosystem partners and has become the worldwide leader in networking-transforming how people connect, communicate and collaborate.

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