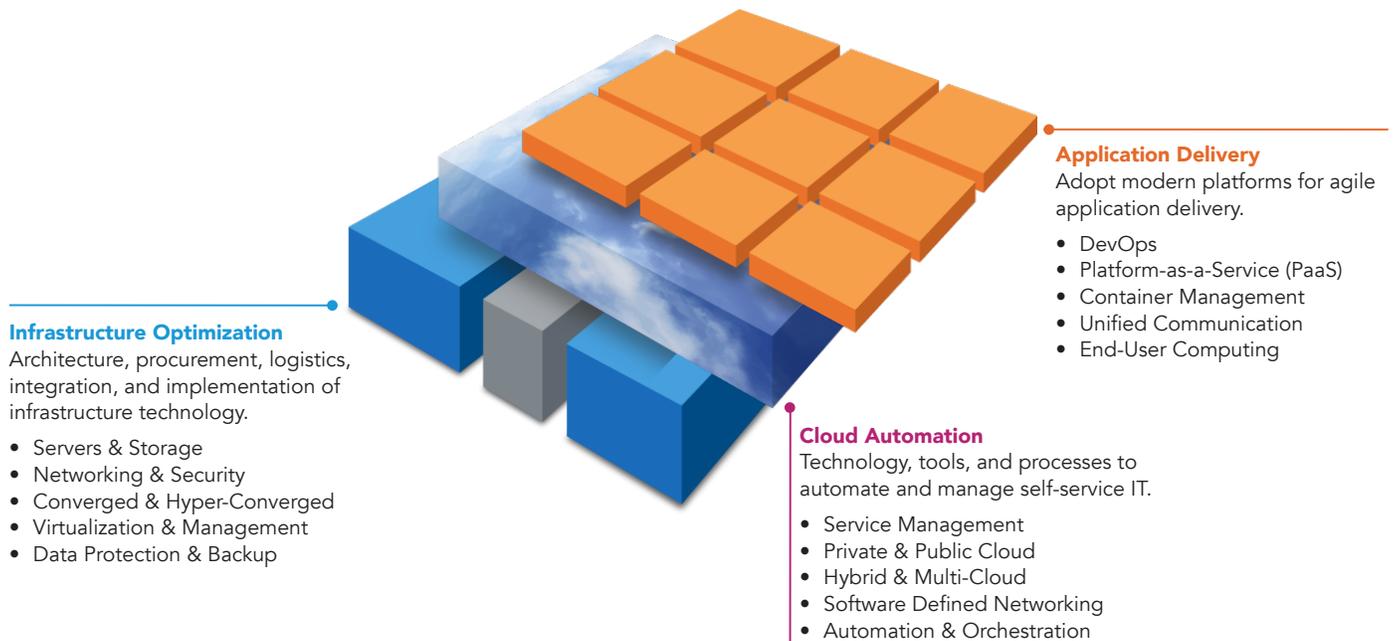


KOVARUS STORAGE ARCHITECTURE METHODOLOGY

KOVARUS 3-TIER APPROACH TO MODERNIZING DATA CENTERS

Kovarus maintains a three-tier approach to modernizing data centers. This approach focuses on the automation and orchestration of data center multi-cloud environments. We specialize in making on-premises resources as easy to consume as the public cloud. Below we identify the areas of focus in this effort:

KOVARUS SOLUTIONS PORTFOLIO



APPLICATION DELIVERY

While some technologies are adopted to provide incremental value or solve a tactical problem, others are undertaken to deliver a business-changing outcome. Kovarus offers a variety of solutions designed to change and improve the way we work.

CLOUD AUTOMATION

The maturation of cloud management technologies is bringing the software-defined data center and zero-touch infrastructure closer to reality every day. Kovarus has extensive experience bringing the cloud into new environments, or extending its capabilities where cloud management platforms already exist.

INFRASTRUCTURE OPTIMIZATION

Infrastructure hardware is the foundation upon which applications and services are built and delivered. Whether optimizing private infrastructure or avoiding waste in the public cloud, Kovarus offers technologies and services to right-size your environment, all while minimizing the cost.

KOVARUS STORAGE ARCHITECTURE METHODOLOGY

Kovarus believes that IT organizations should align their systems to and build value for the goals and objectives of the business they serve. In the IT landscape, the foundational equipment needed to serve the business is divided into three silos: Compute, Network and Storage. Careful consideration is paid to the architecture of each of these component silos when we work with and design infrastructures to run our customer workloads. In this methodology, I will focus on our general approach to the Storage leg of the IT triad.

IT systems have changed so much that now they are unrecognizable from what they were 10 years ago. Hyperconverged (HCI) systems include the triad in a seamlessly integrated package that is quick to install and easy to administer. While equitably servicing a significant portion of business workloads, there is a limit to how far HCI can address unique workloads or scale.

Other changes include advancements in the ability to automate and orchestrate the underlying infrastructure to create self-provisioned constructs at great speed and agility. You have heard this referred to as Infrastructure as a Service or (IaaS). This pace of innovation and advancement will accelerate as new and emerging technologies in the Storage Space continue to develop to support Platform as a Service (PaaS) and further workload optimization into the next generation of business demands.

The historical role of the storage administrator has changed and will continue to change. As the adoption of automation and orchestration expands and proliferates, the industry will see changes architecturally that re-define the role of an IT storage administrator. At Kovarus, we believe in adopting the agile posture which is necessary to grow and develop in an ever-changing, data-centered environment.

At present that means configuring IT resources so that you can do more with less and be ready to deploy the emerging technologies necessary to keep the business competitive. Through properly architecting a storage methodology, a business can access and optimize and even monetize their data in a way that advances their business goals and objectives.

PROCEDURAL APPROACH

At every business storage engagement, we at Kovarus emphasize that the storage ecosystem is more inclusive and diverse than is often estimated by the customer. Storage is the foundation of every application and its proper configuration, performance and placement is paramount in any architecture decision.

Following a defined procedure allows you to fully maximize the utility from your storage investment. By maintaining the procedural approach to allocating, utilizing, and ultimately retiring your storage resources, a business can fully leverage their storage resources and make them last longer and run more efficiently. There are four primary areas of our storage process in our first phase of the storage methodology which are summarized as follows.

PROCEDURAL APPROACH — FIRST STAGE METHODOLOGY

Stakeholders

Storage consumers often represent every functional area of the business. We view these entities as primary or secondary stakeholders depending on their respective level of investment into the storage systems. They are represented by their functional area of the business, e.g. Engineering, IT, Sales, Marketing, Business Development and so on.

It is essential to understand the expectations of each of these stakeholders as it relates to the applications they run that access the storage resources of the business. Each should have a defined SLA, data storage lifecycle, retention policy, security posture, access list, and any other business defined variable that contribute to a metadata tag and category assignment.

Service Level Agreements

Understanding the SLA agreed upon between the storage service provider and consumer is critical to determine data placement, storage type selection, segment co-location and charge back/show back. Having a clear, documented definition is an essential indicator of provider maturity. When defined, SLAs allow organizations to document their performance and measure improvement. Systematically documenting these measurements and using these data points will make storage infrastructure decisions easier in the future.

Information Lifecycle Management

Data is inherently perishable. Typically, the older data gets, the less useful it is in regular daily activities of the business. Exceptions to this include more advanced organizations that recognize that all data is valuable and, in the right hands, can be mined for valuable business insights. A properly developed storage strategy will account for and integrate easily into a data analytics methodology. Kovarus will always enable the integration of storage selection and design that supports data analytics with every engagement.

Daily business operations must maintain an active storage lifecycle regimen that keeps the most requested and time-sensitive data at the correct access tier so the business maintains an optimal performance posture for the applications it serves.

Workload Types And Divisions

Every application has a unique way or “profile” in how it accesses the storage subsystem. In some cases, multiple applications have similar profiles that allow them to co-habit the same storage type. In other cases, the application workload profile is so different, that placing it with other applications will cause all residents of the storage subsystem to perform poorly. Kovarus will classify the storage profiles and make recommendations based on our extensive industry expertise, vendor knowledge and environment variables to optimize performance and maximize your investment.

ASSESSMENT ACTIVITIES AND FUNCTIONS

For the next phase of the storage methodology, it is imperative to have a comprehensive list of all known assets in the environment, both current and planned. This install base list is the foundational document from which we methodically probe, categorize, itemize and document the storage environment. Below are listed a few of the high-level categories we meticulously define in order to have the data points necessary to craft an architectural recommendation for any environment.

- **Workloads** — Assessing workloads is done by leveraging a combination of proprietary tools and skillsets through which we categorize each workload, profile on the storage resource.
- **Policies** — By learning current and defining future policies for storage utilization, categorization, and lifecycle, we provide a disciplined approach that enables efficient consumption of each storage resource. The goal here is to maximize the business investment.
- **Procedures** — Often implemented alongside policies, well documented procedures are the foundation of automation and enable organizations to scale IT resources without adding headcount. Doing more with less begins with properly defined and effective procedures.
- **Fault Domains** — Defining service levels required by the business play a key role in establishing the appropriate fault domain architecture for a storage environment. Some workloads require no protection while others, like ERP systems, require significant investment in protecting against disaster on many levels.
- **Development to Production Workflows** — Each application is classified into one or more categories like Development, Test, QA, Production, Non-Prod, etc. These environments are materially different in composition and function to the business. As an example, in most situations you would not co-locate your development workload on the same system as a production workload. Knowing what the business requirements are for co-locating workloads significantly impacts the architecture of workload placement and must be a focus point.
- **Automation Posture** — Doing more with less requires that all systems adopted must have modern interface support like robust API constructs so IaaS and Infrastructure as Code, among other technology approaches, is made possible for the organization. Proper storage selection must be decided in conjunction with those who understand the core of automation frameworks for the business to benefit with a cohesive ecosystem of foundational technologies in the IT triad.
- **Cloud Strategy** — Every business has or is thinking about a cloud strategy today. Not all storage systems support and integrate well with public cloud offerings. Knowing which have those relevant integration points and properly exploiting them can pay dividends for years.
 - Co-Location has unique abilities to deal with and lower the egress costs public cloud providers charge.
- **Data Residency/Country Ownership (Fair Information Practice/Safe Harbor Laws)** — In the global environment, it is imperative that any storage methodology accommodate for the prolific laws implemented and unique to nearly every geography. This is another area where the architecture can be significantly impacted by laws on where data is allowed to and not to be stored.

RECOMMENDATIONS

After we review, incorporate and analyze each of the points above, and others still not listed, we will compile what has been learned into a comprehensive Storage recommendation and approach. Based on the findings, business policies, constraints and use cases we will recommend products, policies and procedures that will address all the needs of the business now and into the foreseeable future. Through our comprehensive expertise, we will add our industry experience to future-proof your business through our recommendations in ways that may not be immediately obvious.

Our recommendations come in the form of a compiled report containing data collected through the process, supporting materials, tools used and rationale for conclusions made. This report is a key tool our customers use as the source of truth in making key decisions for years after the engagement.

THE KOVARUS ADVANTAGE

- Experts in modernizing and automating IT
- Premier partner of leading technology companies
- Extensive array of certified specialists
- Broad industry experience
- Multi-vendor technology expertise
- Proven methodologies to help accelerate business through IT

TAKE THE NEXT STEP

For more information, please contact Kovarus at (800) 454-1585 or email us at sales@kovarus.com

About Kovarus

Kovarus is a systems integrator that helps companies modernize and automate IT. We enable businesses to transform their IT service delivery to help them accelerate innovation and deliver cost-effective business outcomes. Kovarus has helped some of the greatest companies in the world by leveraging the Kovarus Solutions Portfolio of best-in-class technologies and services to deliver business services faster, at scale and more effectively to provide them a competitive advantage. With an extensive array of elite technical certifications and credentials, leading technology partners continually recognize Kovarus for its commitment to excellence and its focus on delivering exceptional customer service. To learn more, please visit www.kovarus.com.