# How to Maximize Value in Cloud Environments

## Your cloud infrastructure is a strategic asset

Enterprises of all sizes and types are adopting cloud technologies to achieve today's strategic goals and to support future innovation and growth. A cloud-based infrastructure can scale without significant capital investment and delivers the flexibility and agility that can seldom be realized in a more traditional data center.

The ease of access can tempt organizations to consider cloud computing assets as subordinate to on-premises servers. However, as a trusted cloud advisor, you can help your customers make informed decisions about how they approach and optimize their cloud infrastructure as a strategic asset. This guide will help you have those customer conversations.

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# Seeing trends and new opportunities

A cloud expert can help customers understand their options, prioritize goals, and develop operational skills to achieve business objectives and prepare for the future.

**Start by discussing key cloud trends and potential benefits with customers:**

### Technological advancement and agility

Evolving and advancing technology is creating new opportunities for businesses to optimize their operations, improve efficiency, and deliver savvier products and services. Being able to spin up new services and offer them to many regions at a moment's notice is a key advantage.

### Competitive advantage

Markets are becoming more saturated and competitive. By embracing a cloud-native infrastructure, organizations can differentiate themselves from their competitors, as they can develop and deploy solutions faster with more-efficient innovation and greater flexibility. This kind of agility can also enhance customer experience and improve overall business performance.

### Operational efficiency

Another trending differentiator is an organization's operational efficiency. This includes streamlined and automated business processes. Lack of a cloud strategy can result in a costly mismatch between requirements and resources, leading to unplanned cost overruns, underperformance relative to capabilities, or over-provisioning.

### Data-driven insights and decision-making

Organizations today have massive repositories of data, but they're not using their data effectively to inform their decision-making. By implementing cloud technologies that support robust data analytics and artificial intelligence (AI) capabilities to identify patterns and trends, your customers can gain a deeper and more accurate understanding of their business and market dynamics.

### Open source

The challenges of today's marketplace demand innovation and transparency. The open source approach provides access to an array of innovative solutions and software development tools. With open source technologies, customers can avoid vendor lock-in, maximize flexibility, and accelerate deployments to achieve their goals faster and more efficiently.

# Identifying customer pain points

It is relatively straightforward to migrate data center functionality to the cloud via a simple "lift and shift" transition or to adopt new, cloud-native applications and services. It is more challenging, however, to plan for a cloud infrastructure that can continue to support an organization's needs in a rapidly evolving future.

A successful, durable cloud strategy depends on many complex decisions. Organizations must weigh critical factors, including cost, privacy, technical specifications, and business goals, all of which may change over time.

You can play an important role as a trusted cloud advisor, bringing together the right expertise, operations, and information to help customers make better decisions and develop processes to address current and future challenges.

### Common challenges and suggested solutions

| CHALLENGE | SOLUTION |
|---|---|
| Lack of cohesive governance | Help customers to establish a Center of Excellence (COE) that draws from cross-functional teams to gain a high-level perspective and organizational buy-in about cloud-related costs, security, operations, management, and planning. |
| Fragmented cloud-related initiatives | The pay-as-you-go nature of cloud computing makes it easy for various groups or individuals throughout an organization to access cloud resources, which can lead to potential duplication of services, vendor conflicts, and cost overruns. To help prevent this, advise customers to establish an interdisciplinary FinOps framework that shares goals and responsibilities for all aspects of cloud management. |
| Deployment model uncertainty | Conduct an analysis of business needs, projections, and current technology to identify the most important use cases and applications and match them with the appropriate resources for their cloud journey. Those use cases will drive the choice of deployment models: private cloud, public cloud, a hybrid cloud combination of public and private, or a multicloud infrastructure that draw on the resources of several cloud service providers (CSPs). |
| Dependency on a single cloud vendor | Explore a multicloud strategy to maintain maximum flexibility for the future. Multicloud implementations prevent vendor lock-in and help mitigate the risk of dependence upon a single cloud vendor. |
| Sprawling amount of cloud instances, vendors, and code bases | When cloud engagements proliferate without coordination and control, this can lead to maintaining multiple code bases and integration challenges. Instead, help your customers choose instances that are based on a common architecture to offer the portability and performance needed to transition workloads from the data center to the cloud. |

## Common challenges and suggested solutions, continued

| CHALLENGE | SOLUTION |
|---|---|
| Floundering cloud initiatives | Build a strong foundation based on operational visibility, governance policies, and organizational culture. Incorporate support for network security and operational integrations for monitoring, service traceability and auditability, and data governance, with built-in accelerators and other hardware-enabled features. |
| Workload migration complexity | Migrating workloads to the cloud properly to meet specific needs and usage types has a lot of moving parts; knowing how to select cloud instances, prepare data, then implement migration of workloads to the cloud requires the expertise you can offer your customers. |
| Over- or underprovisioning | The entire premise of the cloud is to buy services and pay as you go. However, over- or under-provisioning can lead to unexpected and unnecessary expenses. Help customers to right-fit cloud resources with automation, optimization, and monitoring of applications and utilization patterns. |
| Slow time to results and high subscription costs | Optimizing cloud spend happens by right-fitting instances and ensuring maximum performance. By upgrading to the latest technology, your customers may save budget with workloads that minimize processing power because the cores, or processing, are faster. While it may seem counterintuitive, your customers can reduce spend and innovate faster, or innovate more, by maximizing processing power with the most current technology. |
| Infrastructure errors | Encourage customers to tag all infrastructure elements. Tagging helps assess and map utilization patterns to provide better information for troubleshooting and problem-solving. |
| High software licensing costs | An overlooked cost center in enterprises can be software licenses per user or instance. When a cloud instance is carefully considered relative to licensing fees, a smaller-sized instance can change software license implications. By auditing cloud usage and associated licensing costs, you may be able to help your customers reduce budget output. |
| The need to deploy AI | Your customers need a build-once-and-deploy-everywhere approach with flexible, open, energy-efficient, and more-sustainable solutions that allow all forms of AI, including GenAI, to reach their full potential. Integrating cloud with AI means enterprises are not only enjoying scalable, on-demand, centrally manageable cloud computing infrastructure, but they can also analyze data to get actionable insights. |

**TECH TIP**

See how to right-fit the cloud so customers get the compute resources they need without overprovisioning.

**Watch Rightsizing the Cloud ›**

**PARTNER RESOURCE**

Explore cloud computing solutions from Intel.

**Review Cloud Computing Solutions ›**

**PARTNER RESOURCE**

Learn the steps to optimize the cloud, from the FinOps level to infrastructure and workload-level optimization opportunities.

**Watch How to Optimize the Cloud ›**

# Researching strategic hardware and software choices

Cloud management is a strategic imperative. To be successful, an organization's leadership must incorporate short- and long-term business goals into cloud solution design and deployment.

Hardware features are a critical part of the cloud infrastructure. When choosing cloud instances, it is important to consider the underlying hardware and find the best fit for business-critical workloads. Assess current needs and those for potential future growth. Some workloads may run in the data center or in a private cloud, some may migrate to the public cloud, while others may need a multicloud infrastructure.

Cloud operations can be simplified with the support of a cloud management platform. This helps the organization's IT team monitor and coordinate cloud services, resource optimization, server virtualization, and regulatory compliance.

### Choose Intel® platforms in the cloud

Intel® platforms are nearly ubiquitous in the data center and at CSPs worldwide—and most popular cloud workloads are optimized for Intel® architecture.

**TECH TIP**

Weigh the benefits and trade-offs of different cloud computing platforms to choose the right processors and technologies for specific workloads.

**Explore technology options ›**

**PARTNER RESOURCE**

Discover technology that can help protect against Permanent Denial of Service attacks.

**Discover Intel® Platform Firmware Resilience (Intel® PFR) ›**

**PARTNER RESOURCE**

Choose a cloud management platform to manage resources and applications across a hybrid cloud.

**Explore Choosing a Cloud Management Platform ›**

### Migrate. Measure. Optimize. Monitor. Repeat.

One of the most critical elements of successful cloud deployment and operations is the continuous monitoring and measurement of the cloud infrastructure, applications, and performance. AI-enabled cloud telemetry is a powerful source of information about IT and cloud infrastructure that can generate actionable insights about cost, reliability, optimization, licensing, and security.

As the migration process gets underway, optimization efforts shift from planning to actual workload placement. These decisions can be extremely complex, as there are many choices of CSPs and instances. Additionally, some workloads might work better in the data center, while others require the scalability and flexibility of the public cloud—the combinations are exponential.

### Deploy optimization tools throughout the DevOps cycle

During the analysis stage of the cloud journey, cloud architects and FinOps teams can accelerate the migration process with Dr Migrate. Dr Migrate analyzes applications, workloads, and resource needs automatically and delivers a detailed migration plan that simplifies decision-making.

To save time, analyze an organization's cloud workloads automatically and match them with platform and service combinations using Intel® Cloud Optimizer by Densify. This produces recommendations that help organizations save money and negotiate effectively with CSPs.

**PARTNER RESOURCE**

Speed up AI development by testing code on the latest Intel® platforms and configurations.

**See Intel® Tiber™ AI Cloud ›**

*"85% of workload placement choices by 2027 will require ongoing optimizations due to shifting product, instance availability, and pricing requirements."*

—Gartner Research

## Security in the cloud: Protecting data at rest, in flight, and in use

Given today's increasingly sophisticated cyber threats, security is an urgent priority for cloud implementations. Security needs are even more complex in highly regulated industries, such as finance and healthcare.

A key strategy to consider is a zero trust cloud security framework based on constant validation, identity and access management, and role-based authorization of users and devices. Zero trust supports Confidential Computing, which helps secure and isolate the most-sensitive data, AI, or model assets with hardware-enhanced memory encryption.

The base of Intel® Confidential Computing is a Trusted Execution Environment (TEE)—also called an enclave—where data and code are isolated and shielded from other software, including the operating system and cloud service stack.

## Built-in security starts with silicon

Many CSPs offer integrated security controls, as well as Intel-powered instances that take advantage of built-in security features and accelerator engines.

## Intel® Security Engines

Intel Security Engines in Intel® Xeon® Scalable processors help protect data at rest, in transit, and in use for sensitive workloads in the cloud, at the edge, or on-premises, while mitigating the impact on system performance. These built-in security capabilities include:

**Intel® QuickAssist Technology (Intel® QAT)**
to offload and accelerate compute-intensive security capabilities and tasks


**Intel® Software Guard Extensions (Intel® SGX)**
for hardware-based encryption that isolates specific application code in memory

**Intel® Trust Domain Extensions (Intel® TDX)**
to facilitate a hardware-based TEE within a virtual machine

## Validate TEEs with third-party attestation

As enterprises increasingly look to multi/hybrid-cloud environments, there's growing interest in a trusted third-party assurance service and new implementation of a trust authority to help build higher confidence in moving sensitive data to the cloud.

### Discover the Intel® Confidential Computing portfolio

The Intel Confidential Computing portfolio offers security technologies and services to meet the unique security needs and regulatory requirements of businesses of all sizes across industries. With remote ISO-certified attestation of TEEs for multilocation deployments offered by Intel® Tiber™ Trust Services, you can choose the level of security you need to realize more value from your data while remaining protected and compliant.

TECH TIP

Design security into every aspect of the cloud infrastructure.

**Read Cloud Security Architecture: Building a Foundation of Trust ›**

TECH TIP

Attestation, preferably by an independent third party, can verify the trustworthiness of a computer-based asset.

**Learn about attestation with Intel® SGX ›**

PARTNER RESOURCE

Build confidential computing expertise with enablement packages.

**Access Confidential Computing Enablement Package ›**

**Access Confidential Computing ISV Enablement Package ›**

# Exploring real-world use cases

The cloud has grown rapidly as enterprises around the world shift and scale applications and infrastructure from on-premises data centers and cloud-native applications proliferate with entirely new sets of capabilities.

Some of the use cases for the cloud include XaaS business models like IaaS and SaaS, file storage, data analytics, data backups, disaster recovery, and software testing and development.

A variety of use cases are established, and more continue to emerge.

## AI-enabled cloud capabilities

AI is continuing to transform how we live and work, enabling a diverse and ever-expanding set of use cases and workloads. As AI models grow in complexity and reach, including generative AI, they place increasing demands on compute resources and power consumption.

Integrating cloud with AI helps your customers to enable a scalable, on-demand, centrally managed cloud computing infrastructure that yields actionable insights through data analytics. Acting on those insights can create a competitive advantage by revealing new, innovative opportunities, strategies, and service models, including energy conservation options.

**PARTNER RESOURCE**

Find tools and resources from Intel to prepare, build, deploy, and scale AI solutions.

**Explore the portfolio ›**

**PARTNER RESOURCE**

Role-play scenarios describe how to handle cloud business use case discussions.

**Watch course: Aligning Cloud Business Needs ›**

**PARTNER RESOURCE**

Show your customers how AI can transform their business to increase profits and create efficiency by using these enablement tools and resources.

**Explore AI enablement package ›**

**PARTNER RESOURCE**

Learn about the benefits of Domain Specific Models for Enterprise, how Intel® Xeon® Scalable processors and Intel® Gaudi® AI accelerators are best suited to your business needs and why they are the leading choice in the market.

**Explore enterprise AI enablement package ›**

## Intel® AI technologies and tools

Intel helps to accelerate and simplify AI development with AI-optimized hardware, software, tools, frameworks, reference designs, and pretrained models for every stage of the AI workflow. In addition, built- in Intel® Accelerator Engines in Intel® Xeon® Scalable processors help optimize workload performance and improve cost-effectiveness.

## Work the edge

Competitive pressures and the evolution of remote and hybrid workforces are driving a wave of digital transformation worldwide. Cloud and edge computing, infused with AI, yield a new level of workload convergence that creates operational efficiencies, innovation, and plenty of advantages for organizations and users alike.

The edge is a continuum of locations outside of a central data center. This means data is analyzed, processed, and stored closer to where it is generated—at these edge locations. As customers look to embrace edge-to-cloud computing, they will face development and deployment challenges. This can result in long-term costs and decreased flexibility as best practices, workload optimizations, and even innovative deployment techniques are overlooked for the sake of speed. Your expertise as a trusted cloud advisor can help your customers implement the right edge-to-cloud strategy.

There are three basic paths to edge computing:

1. Purchase solutions and services kits from original equipment manufacturers (OEMs) that enable data to be collected, stored, and processed locally.
2. Purchase edge solutions directly from CSPs.
3. Use your expertise to customize the path to the cloud using both OEM kits and CSP packages.

This third option showcases your expertise as a business-building opportunity. Analyze your customers' workloads, budgets, security needs, and vendor choices to match their technology needs and business goals with the right solutions.

**TECH TIP**

Competitive pressures and workforce transitions are driving a wave of digital transformation worldwide.

**Explore Digital Transformation Resources and Solutions ›**

**TECH TIP**

Intel® Tiber™ Edge Platform streamlines the process of developing and deploying scalable edge AI solutions while orchestrating applications and workloads on standard hardware with cloud-like simplicity.

**Review Intel Tiber Edge Platform ›**

**PARTNER RESOURCE**

Deploy edge-native solutions more efficiently with Intel® SmartEdge.

**See Edge-Native Kubernetes for the Software-Defined Edge ›**

**PARTNER RESOURCE**

Discover how to help customers when choosing the right path to edge computing.

**Watch Choosing the Right Path to Edge Computing ›**

# Considering XaaS business models

One of the most important parts of a cloud strategy is choosing the right cloud service models for the organization and its users. Choices range from an on-premises private cloud to a variety of "as a service" models—or XaaS—that are hosted by a third party.

For example, popular options include Infrastructure as a Service (IaaS), where the organization is responsible for the software stack, and the CSP typically owns and manages all hardware.

An alternative is Platform as a Service (PaaS), where the CSP provides the operating system and databases as well as the hardware infrastructure, and the organization is responsible for applications and data.

Software as a Service (SaaS) providers are responsible for the applications, while users manage their own data, and the CSP takes care of everything else.

**TECH TIP**

"Everything as a Service" (XaaS) models offer a broad range of options for cloud development, deployment, and management.

**Read IaaS vs. PaaS vs. SaaS: Cloud Service Model Overview ›**

**PARTNER RESOURCE**

Look for opportunities to support customers and their cloud infrastructure with Networking as a Service.

**Explore Cloud Infrastructure for Network Functions and Networking as a Service ›**

# Future-proofing for agile readiness

As a trusted cloud advisor, you are looking for ways to create additional value for your customers. Help your customers think ahead and do future-scenario planning so they can be prepared for emerging needs and business opportunities with the right technologies in place.

To get ahead of where the cloud is going, it's important to automate and simplify the cloud for your customers.

### Automate the cloud

Making automation part of your cloud DNA is a future-forward strategy. Whether it's about management, scaling, monitoring, costs, or reporting, the cloud should be automated to improve the consistency and efficiency of operations.

Customers are looking to maximize their investments and get higher utilization. That means it's important to make sure from the start that there are tools that provide information and recommendations to application developers.

**PARTNER RESOURCE**

Discover four inflection points across the cloud life cycle that will give you an opportunity to deliver deeper advice and insights to your customers and spark more revenue potential for your business.

**Watch Opportunities Across the Cloud Life Cycle >**

## Simplify cloud innovation

When it comes to cloud tools innovation, the first wave was Infrastructure as Code, or IaC, driven by the need for repeatable code scripts, agile design processes, and efficient, sharable architecture. The second wave, Policy as Code, or PaC, is still gaining traction in the developer community. PaC addresses the FinOps, DevSecOps, and governance requirements by ensuring the right decisions are made in application architecture according to operational and security policies.

Now, a third wave is coming, and Intel is leading it with workload Optimizations as Code.

Pioneering the next level of innovation in this area, Intel Corporation is introducing workload Optimizations as Code, which combines Optimized Cloud Recipes, Optimized Cloud Modules, and deployment automation. This offers numerous benefits to the AppDev, DevOps, and FinOps community through new collaborations to optimize application architecture.

You can now optimize public cloud deployments for backup and disaster recovery resilience and to measure and monitor migration and cost controls. You can use open source technology to fine-tune AI models rather than build them from scratch. At every stage of the cloud journey, there are new tools and new possibilities that can streamline efficiency and surface new opportunities.

The potential for elevating operations to the cloud is vast—and your expertise can help simplify all aspects of the cloud for your customers.

## Decision-making driven by code

You can empower your customers' decision-making by providing the right language and solution options. And by writing their operations into opinionated code—which is more prescriptive about how to execute certain tasks—you can simplify and future-proof cloud provisioning.

With automated selection, it's important to use policy as code that validates how things are going and prevents instance selection drift, ensuring your customer is on the right architecture.

**TECH TIP**

Intel is working with HashiCorp to provide developers with Sentinel policy recommendations that leverage integrated Intel® Xeon® Scalable accelerators to optimize workloads and improve cost-effectiveness in the cloud. HashiCorp offers built-in opinionated code and includes tools like Terraform Enterprise and Terraform Cloud to manage infrastructure as code, infrastructure version control, and automate provisioning at scale.

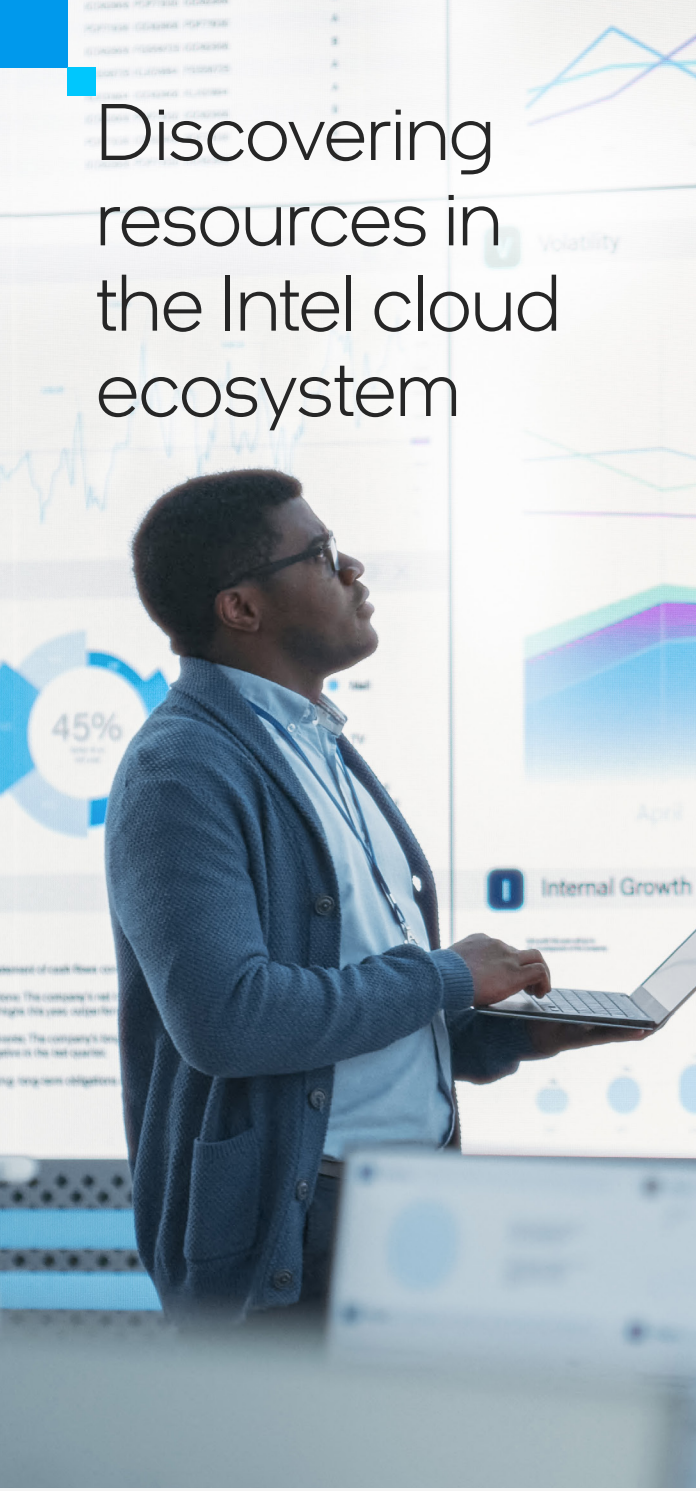
**Read Maximize Your Investment with Intel and HashiCorp ›**

**PARTNER RESOURCE**

Support future success in the cloud by helping customers automate and make the right decisions for organizational workloads with Intel® technologies.

**Watch Automated Instances ›**

# Discovering resources in the Intel cloud ecosystem




Intel can help organizations improve operational agility with proven products and excellent performance for cloud workloads. Intel® platform-based cloud instances can be spun up quickly and integrated seamlessly with an organization's existing data infrastructure to create a hybrid cloud that supports business priorities.

## What you can do now

**Watch Intel® Cloud TV: Why Intel for the Cloud ›**

**Find cloud developer resources ›**

**Join the Cloud Insider Community ›**

**Join the Intel® Partner Alliance ›**

**PARTNER RESOURCE**

Activation zones bring together relevant, vertically specific content, resources, and tools to help activate building, launching, marketing, and selling products and solutions based on Intel technology.

**Explore Intel® Partner Alliance Activation Zones ›**

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