Higher education institutions are in various stages of building private clouds to make it faster and easier to add new users and services, and to lower costs. The main characteristics of cloud computing are:

- **Self-service:** Campus users generally use a web portal to request computing and storage resources.
- **Elasticity:** Users can increase or decrease resources as needed. In some cases, the cloud makes the adjustment automatically.
- **Pay-as-you-go pricing:** Rather than buying more resources than you need in anticipation of growth, you pay only for the resources you need today.
- **Resource pooling:** Campus data centers may have dozens or hundreds of servers and storage devices operating at very little of their capacity. Costs drop when IT teams can pool these resources for students, faculty, staff, and researchers to use as needed.

You can smooth the transition to cloud computing with some preplanning:

- Give some thought to the type of cloud computing that best suits campus needs. **Private clouds** are operated only for your college or institution. They can be managed by campus IT personnel or by a third-party, and hosted on campus or off-site. **Community clouds** are shared by several organizations. Cal State University East Bay, for example, operates a community cloud shared by other universities in the system. **Public clouds** are owned by a third party and made available to customers. **Hybrid clouds** are combinations of two other types of clouds—for example, the university’s own private cloud tied to a public cloud used for overflow.
- Identify opportunities and benefits for migrating from your existing computing arrangements to cloud services. For example, application virtualization generally reduces server and licensing costs, and virtual desktop infrastructures reduce desktop management costs while giving campus users the flexibility to access their applications and data from anywhere.
- Make sure your IT infrastructure complements cloud-based services. Virtualization is required, and you’ll also need scalable bandwidth in the data center.
- Develop a framework to evaluate costs, benefits, and risks of moving different campus services to the cloud. As an example, determine if certain data cannot be stored on a public cloud for legal or security reasons.
- Determine if you have the IT skills needed to manage a private cloud, or if it makes more sense to outsource.
- Prepare your network for cloud computing. Far more than just plumbing, the network also plays a critical role in making sure the cloud is secure and delivers the expected performance levels as adoption increases.

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