

PRICE AND VALUE MODELS

Every undertaking has a cost and a benefit associated with it. Consuming cloud services is no different. This chapter considers the cost element of your using a cloud service and the price you pay for it after assessing various pricing regimes, known as price models. (Price models are also referred to as pricing models.) To offset the price you pay for the cloud service, you need to realize a commensurate benefit. That benefit is assessed by considering value models that can be related to cloud computing. Having an understanding of the price and value models will enable you to compare various cloud computing services in an objective manner. To help you in this regard, the chapter ends with a discussion of the various financial metrics that you would use for evaluating cloud services from a financial perspective.

Price Models

Price models provide a means of establishing the price that you pay in order to receive the value of a product or service. A cloud service provider will compute the costs of provisioning and operating a cloud service using a cost model. The cost model will then be converted into a price model. The type of price model selected will depend on the cloud service provider's business model, marketing strategy, and revenue expectations. In order to compare cloud services in an objective manner, it is important for you to know about the various types of price models.

Every price model starts its life as a cost model. The cost model is a financial model that the cloud service provider creates to find out how much money to outlay on a particular cloud service in creating it, operating it, and then refreshing it to newer technologies after three years. Three years is the usual life span of technology before it becomes outdated, and five years is generally the absolute maximum the cloud provider will have before replacing the technology. The cost model will include such factors as inflation, exchange rate variations (if applicable), depreciation, electricity costs (these can be significant because of the power and cooling required by a large number of servers), floor-space costs, software license costs, labor costs, and capital costs to buy and operate servers. Margin and a factor for risk are added to the sum of all the costs to arrive at a price. The price will have two characteristics: a

nonrecurring and a recurring element. The nonrecurring element of the price is converted to a recurring element by amortizing the net present value into a series of recurring cash flows. (The mathematics for doing this is considered toward the end of this chapter under the heading of Net Present Value.) These cash flows are then added to the recurring element to arrive at a monthly price point for providing the service to you. This recurring price point is expressed as the price model and this price is used to sell and market the cloud service.

There are a variety of price models in existence. Broadly, let us categorize them as utility-, service-, performance-, and marketing-oriented models. Although cloud computing today mostly uses utility- and service-based price models, a wide range of models are considered because financial and business innovation is bound to catch up with technical innovation, thus enabling some of the less used models to enter the cloud computing domain in future. You may even choose to use or specify your own model in case you need to commission your own private, community, or hybrid cloud, after learning and evaluating all your options concerning the various price models discussed below.

Utility Price Models

Utility models are metered price models whereby your usage of the service is monitored and you pay accordingly.

Originating from the price plans that utility companies have adopted, they are characterized by regular payments, often monthly, to the cloud service provider. Three utility price models are discussed here: consumption, transaction, and subscription based price models.

Consumption-Based Price Model The consumption price model is a commonly used model for IaaS and PaaS. You pay for the computing resources that you use, for example, amount of storage (in Megabytes or Gigabytes), computing or processing power (in terms of CPU cycles or number of processor cores used), and memory (in Megabytes or Gigabytes). An average consumption rate of these resources is computed over a day, week, or month and you pay for the average utilization. This is a rather crude model that does not scale well for SaaS, INaaS, or BPaaS, since for these resources you want to be charged in a meaningful way when it comes to how your business operates. For instance, for an INaaS service that provides you with the latest tax rules, you really ought not to care how many CPU cores or memory is used in delivering that information to you. But, for the cloud service provider, there could be other components that contribute to the cost of providing the service such as application licenses, data gathering, and maintenance costs. So for SaaS, INaaS, or BPaaS, other price models are more appropriate.

Transaction-Based Price Model Transaction-based pricing uses transactions, instead of computing resources, as the basis for pricing. The transactions can be business related, such as invoices processed for an invoicing BPaaS, data related for INaaS, or application related for SaaS. You can also have transaction-based pricing with IaaS and PaaS, for example, by using the bandwidth as an indicator of computing resource utilization; thus, a consumption-based price model can be converted to a transaction-based model by assessing the bandwidth used by each transaction.

The cost of a transaction is calculated by dividing the cost of providing a cloud service by the estimated transaction volume over a given period. This is then the unit transaction price. This price model is suitable under the following circumstances:

- Transaction volumes are known and predictable.
- Your business process can be defined clearly and can be measured in discrete units to represent a transaction.
- The transaction volume is tied to your cost drivers.
- From the cloud service provider's perspective: when business processes are standardized and driven by transactions.

Transaction pricing is most suitable for INaaS and BPaaS abstraction levels, and is equally suited to all cloud deployment models.

Subscription-Based Price Model Similar to the all-you-can-eat model, the subscription price model is when you pay a price, usually monthly, in order to use a service. For example, when you subscribe to a magazine, you pay a regular fee regardless of whether you actually read all of it, some of it, or none of its articles. With the onset of web-based magazines or news portals, the content is refreshed quite often, so the content is not a fixed amount as with a paper magazine. Paying a subscription for such a service approaches the all-you-can-eat model as your capacity to consume becomes less than the rate of new content being produced. Sometimes there is a contractual period over which you are bound to pay the subscription. In cloud computing, for instance, you would have a monthly fee for computing resources that are allocated to you, and you would pay the monthly amount regardless of whether you used those allocated resources. Also you may have a notice period of three months such that, should you decide to no longer use the service, you would need to provide a notice three months beforehand. Subscription pricing can be used well for all cloud deployment models and abstraction levels.

Service Price Models

Service models use the benefit delivered to you, such as the SLA realized, risk transfer, or money saved, as the criteria for defining the price you pay for the cloud service. Broadly, the fixed price model is a risk transference model whereas the other two models discussed—volume and tiered—largely provide money and service benefits to you as a cloud user.

Fixed Price Model The price that you pay for this service is fixed on a yearly, quarterly, or monthly basis. The fixed price can be made up of two components: recurring and nonrecurring prices. The latter is a one-off amount that you pay at the outset followed by recurring payments at regular intervals. The fixed price model is generally chosen when you have a clearly defined scope that is aligned to your short-term goals. Although this is used to transfer your risks related to delivery, people and quality, you will still own the risk of the service's scope by deciding how much of the service to use and to what extent. The risk transferal occurs through the SLAs that you define and agree with the cloud service provider. Fixed pricing can be used well for all cloud deployment models and abstraction levels.

Volume-Based Price Model Volume can relate to the number of users, amount of storage space, speed of

transactions (denoted as number of transactions per minute or hour), amount of bandwidth, or processing power utilized, for example. Any one of these parameters can be used as the basis for deciding the price you pay for the cloud service. Because volume varies over time, business cycle, or events such as a marketing drive, the price periodically changes. It is therefore imperative to define, calculate, and measure it. For instance, the price for a thin-client computing service where your employees use cloud services on a volume-based price model could be calculated on the basis of average users, peak users, allocated users, or concurrent users per day, or a combination of these. Similar considerations would apply to other parameters, should they be used in the volume pricing instead. Although volume pricing is most often used in IaaS and PaaS, it is just as suitable for the other abstraction levels.

Tiered Price Model The tiered price model uses a tiered form of pricing that is based on SLAs, volume, or amount spent. It is similar to the tiers that airlines have for their membership levels that are determined by the amount you spend on travel with the airline. With cloud computing a similar form of tiered pricing can apply with greater discounts provided that you spend a certain amount each year. Alternatively, you could have tiers based on the SLAs such that the more stringent the SLAs, the more you pay. For example, there could be three SLA tiers and three

different price tiers for them, with each SLA tier providing greater benefits to you. Or you could have the tiers based on volumetrics such as the number of users being served. That is, suppose your business requests a cloud service provider to provide storage to your employees such that they can store documents and access them from anywhere and from any computer. The storage provider could have three tiers for its pricing: for serving less than a hundred users, the price could be \$5 per user per month; if your company needs storage for users between a hundred and a thousand in number, then the price could be \$4 per month per user; and for more than a thousand users, the price could be \$3 per month per user. These bands, or tiers, that define the prices for you on the basis of volume represent a tiered price model. And the basis for creating the tiers can be volume, SLAs, or the amount spent. Tiered pricing can be used for all cloud deployment models and abstraction levels.

Performance Price Models

Performance models are benchmark-based models that rely on key metrics, or benchmarks, to decide the price paid. Most performance models originate from employee remuneration or outsourcing related price strategies but can be applied to cloud computing, especially to a private or hybrid cloud service. Sometimes these models are used to align your business goals to those of your service provider's goals in order to create a true partnership.

Performance price models exhibit some common traits:

- They require a clearly defined output or metric that can be measured easily.
- The metric is often aligned to a business process or outcome with a demonstrable correlation to its impact.

We consider here the outcome, business-linked and gain-share price models as being within the category of performance models.

Outcome-Based Price Model If your department wants to use cloud computing because it wants to reduce time to market (this being one of the seven value models), then you may want to negotiate a “bonus” payment to the cloud service provider that is linked to that outcome. Most outcomes use metrics that relate to cloud computing’s value proposition, as expressed by the value models that we consider in the next section. There is a difference in psychology between the outcome-based model and some performance-related price models. With the former, you provide a bonus if an outcome is achieved, and with the latter, you penalize the provider if an SLA or benefit is not realized. Outcome-based models are often used with other models, usually fixed price models, in order to create a value culture based on rewards.

Business-Linked Price Model Whereas outcome-based models use metrics that measure the value of cloud computing, business-linked models measure the contribution that cloud computing makes to the KPIs that affect your business model. One of the challenges is linking the business outcome to the contribution made by cloud computing. Figure 11 shows a possible mapping between the objectives for using cloud computing, as per its value models described in figures 12 to 18, and the related business outcomes as expressed by business KPIs.

Cloud value model		Business KPI
Operating expenditure	↔	Cash flow
Demand flexibility	↔	Productivity
Price flexibility	↔	Cost efficiency
Time-to-market	↔	Cash flow
Location flexibility	↔	Productivity
Asset optimization	↔	Return-on-investment
Profit margin flexibility	↔	Profit margin

Figure 11 Mapping cloud computing objectives to business and financial KPIs

Gain-Share Price Model The gain-share model has its roots in employees' remuneration schemes. The idea is that as the organization gains, it shares some of those gains with its employees. A typical gain-sharing organization measures its own performance and shares the profits with all its employees using a predetermined formula. The organization's actual performance is compared to its historical average (known as its standard or baseline performance) to determine the amount of the gain. In a cloud computing context, instead of having penalties should certain SLAs not be met, you reward the service provider by sharing your profits if the SLAs are exceeded. It is a different approach psychologically. However, you can combine the gain-share model with a penalty-based performance model to create a hybrid performance model.

Marketing Price Models

Certain price models are driven by marketing rather than performance. The key driver behind such models is to attract as much custom as possible and to then monetize it to create a profit. We discuss two such marketing led price models in this section.

Freemium Price Model There are two types of freemium. One is where you try before you buy a more enhanced service, and the other type is where you get a free service but the advertisements provided to you make

up for the service's price. This model is especially suited to SaaS because many software companies such as LinkedIn and Dropbox use it well. They offer a free version of their product that has limited functionality but provide you the option to pay for a premium service with extra features. The idea is to offer enough value to users in the free version in order to attract and retain them, and more value in the enhanced version to ensure that the users convert and maximize the service provider's revenue.

Razor-and-Blades Price Model This pricing model relies on two components, a base component and a reusable component that the base component needs in order to deliver a service. It is akin to selling you razors cheaply, or even giving them away for free, and then making up for it from the prices of the consumable blades. Printers are another example; they are sold cheaply, but the price is made up from the printer ink supplies. In cloud computing, a device or an app that uses a cloud service may be given away, but the price may be made up from the data that is stored, analyzed, and presented by the cloud service. For example, you could have a blood pressure monitor that sends data automatically to a cloud service. The cloud service would then store and analyze the data, which it would use to alert you if a certain blood pressure level were traversed. The sensor could be provided for free or at a reduced price whereas you would pay for the use

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of the cloud service that makes the sensor information meaningful to you. Another example of this is Amazon's kindle that can act as a window to a virtual storefront from which you could purchase a wide variety of goods. The kindle device is sold at a discounted rate, and is called a loss leader, but its value is made up from the increased sales revenue in the storefront that results from its use.

Hybrid Price Models

The utility, service, and performance price models discussed above are not mutually exclusive; they can be combined to produce hybrid price models. For instance, you could have a subscription-based system that utilizes a tiered approach. If the dollar spend per annum were to be at a certain level, then that level would decide the discount tier that would apply to you. One other approach would be to combine the risk transfer of the fixed model with the affordability of one of the utility price models to provide a fixed, monthly, price to the user such that they may consume as much of the service as they wish for that fixed monthly fee. This type of hybrid price model is quite common to many public cloud services such as Google docs and Microsoft Office 365. In fact this is a good pricing model for large or long-term services, especially if they need to be perfected over time. The hybrid price model can be applied successfully to all the cloud abstraction levels and deployment models.