UNIT - V CLOUD SERVICE PROVIDERS

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Cloud Service Providers: EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud, Amazon Simple Storage Service, Amazon Simple Queue ,service, Microsoft, Windows Azure, Microsoft Assessment and Planning Toolkit, SharePoint, IBM, Cloud Models, IBM Smart Cloud, SAP Labs, SAP HANA Cloud Platform, Virtualization Services Provided by SAP, Sales force, Sales Cloud, Service Cloud: Knowledge as a Service, Rack space, VMware, Manjra soft, Aneka Platform

1Q:What do you mean by cloud service provider? Which are the major cloud service providers?

1A:

- Cloud computing is one of the most popular buzzwords used these days.
- It is the upcoming technology provisioning resources to the consumers in the form of different services like software, infrastructure, platform, and security.
- Services are made available to users on demand via the Internet from a cloud computing provider's servers as opposed to being provided from a company's own on-premise servers.
- Cloud services are designed to provide easy, scalable access to applications, resources, and services and are fully managed by a cloud service provider.
- A cloud service can dynamically scale to meet the needs of its users, and because the service provider supplies the hardware and software necessary for the service, there is no need for a company to provision or deploy its own resources or allocate information technology (IT) staff to manage the service.
- Examples of cloud services include online data storage and backup solutions, web-based e-mail services, hosted office suites and document collaboration services, database processing, and managed technical support services.
- Cloud services can be broadly classified into three types: Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS).
- With growing technologies, many more services are emerging in this field, such as Security as a Service (SeaaS), Knowledge as a Service, and Data Analytics as a Service.
- Many companies have come forward to adapt the cloud environment and ensure that the users as well as the companies benefit from this.
- Amazon, Microsoft, Google, Yahoo, EMC, Salesforce, Oracle, IBM, and many more companies provide various tools and services in order to give cloud support for their customers.

2Q:List the tools/services provided by Microsoft and explain them in brief.
2A:
Microsoft:

- Cloud computing provides a new way of looking at IT at Microsoft called Microsoft IT (MSIT).
- Cloud computing is now the preferred and default environment for new and migrated applications at Microsoft.
- MSIT has developed a methodology and a set of the best practices for analyzing their current application portfolio for possible candidates to migrate to cloud computing.
- This analysis enables MSIT to select the ideal cloud computing–based environment for each application.
- MSIT has captured these best practices and documented them for other Microsoft customers who wish to migrate their organizations to cloud computing.

Windows Azure:

- Windows Azure Cloud Services (web and worker roles/PaaS) allow developers to easily deploy and manage application services.
- It delegates the management of underlying role instances and operating system to the Windows Azure platform.
- The Migration Assessment Tool (MAT) for Windows Azure encapsulates all the information to be aware of before attempting the application migration to Windows Azure.
- Based on the response to a series of simple binary questions, the tool generates a report that outlines the amount of development effort involved to migrate the application, or the architecture considerations for a new application.
- The Windows Azure Pricing Calculator analyzes an application's potential public cloud requirements against the cost of the application's existing infrastructure.
- This tool can help to compare current operational costs for an application, against what the operating costs would be on Windows Azure and SQL Azure.
- Windows Azure Pack for Windows Server is a collection of Windows Azure technologies available to Microsoft customers at no additional cost for installation into their data center.
- It runs on top of Windows Server 2012 R2 and System Center 2012 R2 and, through the use of the Windows Azure technologies, it allows you to offer a rich, self-service, multi tenant cloud, consistent with the public Windows Azure experience.

Microsoft Assessment and Planning Toolkit :

- The Microsoft Assessment and Planning Toolkit (MAP) is an agentless, automated, multiproduct planning and assessment tool for cloud migration.
- MAP provides detailed readiness assessment reports, executive proposals, and hardware and software information.
- It also provides recommendations to help organizations accelerate the application migration process for both private and public cloud planning assessments.
- MAP analyzes server utilization data for server virtualization and also server consolidation with Hyper-V.

SharePoint:

- Microsoft offers its own online collaboration tool called SharePoint.
- Microsoft SharePoint is a web application platform that comprises a multipurpose set of web technologies backed by a common technical infrastructure.
- By default, SharePoint has a Microsoft Office–like interface, and it is closely integrated with the Office suite.
- The web tools are designed to be usable by nontechnical users.
- SharePoint can be used to provide intranet portals, document and file management, collaboration, social networks, extranets, websites, enterprise search, and business intelligence.
- It also has system integration, process integration, and workflow automation capabilities.
- Unlike Google Cloud Connect, Microsoft SharePoint is not a free tool.
- But it has additional features that cannot be matched by Google or any other companies.

3Q:What is Google Cloud Print? What are its advantages?

3A:

Google Cloud Print:

- Google Cloud Print is a service that extends the printer's function to any device that can connect to the Internet.
- To use Google Cloud Print, the user needs to have a free Google profile, an app, a program, or a website that incorporates the Google Cloud Print feature, a cloud-ready printer or printer connected to a computer logged on to the Internet.
- When Google Cloud Print is used through an app or website, the print request goes through the Google servers.
- Google routes the request to the appropriate printer associated with the user's Google account.
- Assuming the respective printer is on and has an active Internet connection, paper, and ink, the print job should execute on the machine.
- The printer can be shared with other people for receiving documents through Google Cloud Print.
- Because most printers are not cloud ready, most Google Cloud Print users will need to have a computer act as a liaison.
- Google Cloud Print is an extension built into the Google Chrome Browser, but it should be enabled explicitly.
- Once enabled, the service activates a small piece of code called a connector.
- The connector's job is to interface between the printer and the outside world.
- The connector uses the user's computer printer software to send commands to the printer.
- If one has a cloud-ready printer, one can connect the printer to the Internet directly without the need for a dedicated computer.
- The cloud printer has to be registered with Google Cloud Print to take advantage of its capabilities.

- Because Google allows app and website developers to incorporate Google Cloud Print into their products as they see fit, there is no standard approach to executing a print job.
- Google Cloud Print depends on developers incorporating the feature into their products.
- Not every app or site will have Google Cloud Print built into it, which limits its functionality.
- Naturally, Google builds the service into its own products, but many people rely on services from multiple sources and may find Google Cloud Print does not have a wide enough adoption to meet all their needs.

4Q:Explain SAP HANA Cloud in brief.
4A:
SAP HANA Cloud Platform:

- SAP HANA Cloud Platform is an open-standard, Eclipse-based, modular PaaS.
- In SAP HANA Cloud Platform, applications are deployed via command-line tools to the cloud as web application archive (WAR) files or OSGi bundles.
- OSGi bundles are normal jar components with extra manifest headers.
- The applications run within the Java-based SAP HANA Cloud Platform runtime environment.
- It is powered by SAP HANA and can be maintained using web-based management tools.
- The main features of SAP HANA Cloud Platform are as follows:
- • Enterprise platform built for developers
- • Native integration with SAP and non-SAP software
- • In-memory persistence
- • Secure data platform
- • Lightweight, modular runtime container for applications
- SAP HANA Cloud Platform lets the users quickly build and deploy business and consumer applications that deliver critical new functionality to meet emerging business needs.
- It also helps connect users with customers in more engaging experiences.
- It provides connectivity based on the cloud connectivity service.
- As a result, the platform streamlines the integration of new applications at the lowest possible total cost of ownership.
- Support for open programming standards provides a low barrier entry for developers.
- This makes them productive from the start in building enterprise applications that can integrate with any SAP or non-SAP solution.
- No new coding skills are required to work with SAP HANA.

Virtualization Services Provided by SAP:

- ERP virtualization increases a project's return on investment by maximizing hardware utilization.
- The business benefits of virtualization of ERP applications are shorter development cycles, reduction in IT costs, improved availability, and energy saving.
- A joint service from SAP and VMware helps in transition to a more open and flexible private cloud platform based on proven virtualization technology

5Q:What are the services offered by EMC IT?

5A:

EMC:

- EMC is one of the leading global enterprises that require dynamic scalability and infrastructure agility to meet changing applications as well as business needs.
- EMC chose cloud computing as the ideal solution to reduce the complexity and optimize the infrastructure.
- Offering Information Technology as a Service (ITaaS) reduces the energy consumption through resource sharing.

EMC IT:

- Virtualization is the main concept behind the success of EMC IT.
- By virtualizing the infrastructure, allocation of the resources on demand is possible.
- This also helps to increase efficiency and resource utilization.

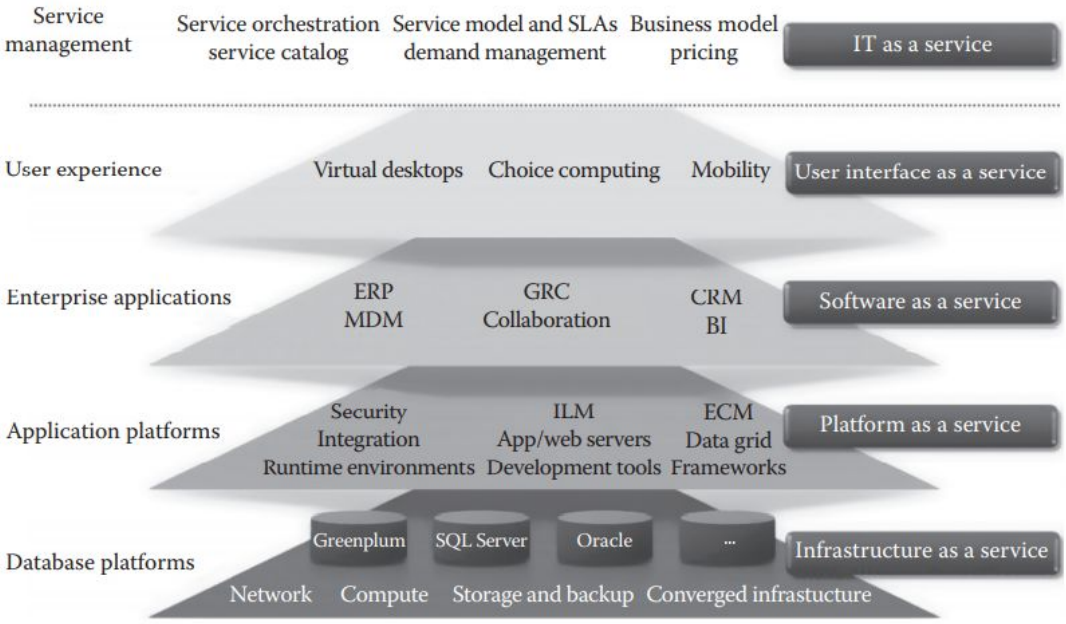

FIGURE 11.1
Cloud services by EMC. (Adapted from EMC IT's journey to the private cloud, applications and the cloud experience, White Paper-EMC.)

- EMC IT provides its business process units with IaaS, PaaS, and SaaS.
- Figure 11.1 gives an overview of the services offered by EMC, which are explained in the following:
- 1. IaaS offers EMC business units the ability to provision infrastructure components such as network, storage, computing, and operating systems individually or as integrated services.
- 2. PaaS provides the secure application and information frameworks on top of application server, web server, database, unstructured content management, and

security components as a service to business units from which to develop solutions.

- EMC IT offers database platforms (Oracle Database as a Service, SQL Server as a Service, Greenplum as a Service) and application platforms (application development, Enterprise Content Management as a Service, Information Cycle Management as a Service, Security PaaS, Integration as a Service) for the purpose of development.
- 3. SaaS provides applications and tools in a service model for business enablement.
- EMC IT brought together several existing business solutions under the unified architecture named as Business Intelligence as a Service.
- It also offers Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) as a Service.
- 4. User Interface as a Service (UIaaS) provisions user and interface experience, rather than provisioning the actual device used.

6Q: Explain the services provided by IBM SmartCloud.

6A:

IBM SmartCloud:

- IBM SmartCloud is a branded ecosystem of cloud computing products and solutions from IBM.
- It includes IaaS, SaaS, and PaaS offered through public, private, and hybrid cloud delivery models.
- IBM places these offerings under three umbrellas: SmartCloud Foundation, SmartCloud Services, and SmartCloud Solutions.
- Figure 11.4 briefly explains the architecture of IBM SmartCloud.

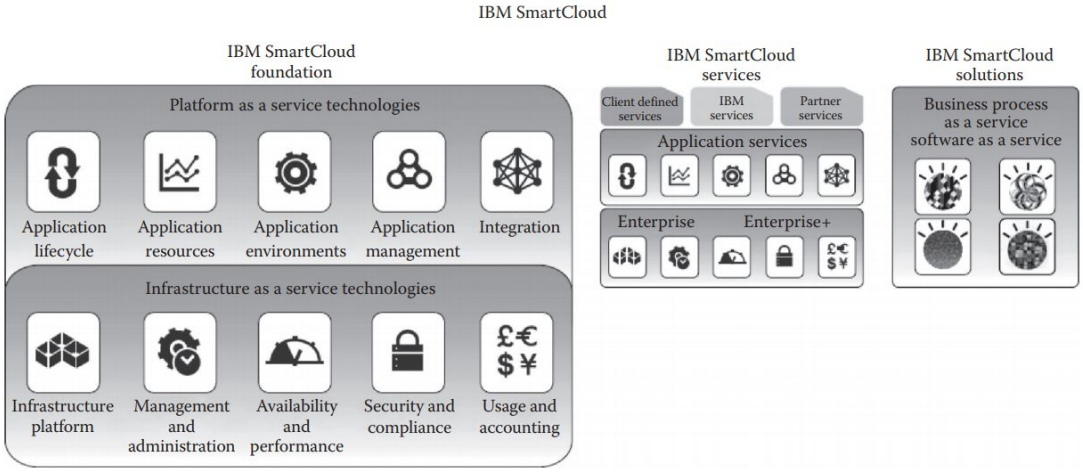

FIGURE 11.4
Architecture of IBM SmartCloud. (Adapted from Transitioning to IBM smart cloud notes, Smart Cloud White Paper-IBM.)

- SmartCloud Foundation consists of the infrastructure, hardware, provisioning, management, integration, and security that serve as the underpinnings of a private or hybrid cloud.
- Built using those foundational components, PaaS, IaaS, and backup services make up SmartCloud Services.
- Running on this cloud platform and infrastructure, SmartCloud Solutions consist of a number of collaboration, analytics, and marketing SaaS applications.
- Along with IaaS, PaaS, and SaaS, IBM also offers Business Process as a Service (BPaaS). Infrastructure cloud services provide the consumer the provision of processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications.
- In platform cloud services, a consumer can deploy consumer-created or consumer-acquired applications onto the cloud infrastructure created using programming languages and tools supported by the provider.
- Application cloud services allow consumers to use the provider's applications running on a cloud infrastructure.
- The applications are accessible from various client devices through a thin client interface such as a web browser (e.g., web-based e-mail).
- Business process cloud services are any business process (horizontal or vertical) delivered through the cloud service model (multitenant, selfservice provisioning, elastic scaling, and usage metering or pricing) via the Internet with access via web-centric interfaces and exploiting web-oriented cloud architecture.
- The BPaaS provider is responsible for the related business functions.

7Q:What are the support services offered by Amazon Web Services?
7A:
Amazon SQS and Amazon S3 are support services:

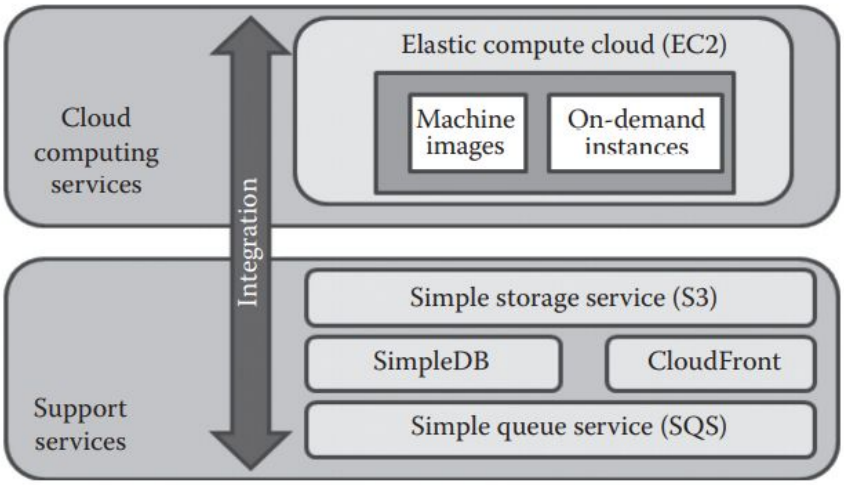

FIGURE 11.3
AWS. (Adapted from http://rdn-consulting.com/blog/tag/azure/, accessed January 16, 2014).

Amazon Simple Storage Service(S3):

- Amazon Simple Storage Service known as Amazon S3, is the storage for the Internet.
- It is designed to make web-scale computing easier for developers.
- Amazon S3 provides a simple web service interface that can be used to store and retrieve any amount of data, at any time, from anywhere on the web.
- It gives any developer access to the same highly scalable, reliable, secure, fast, inexpensive infrastructure that Amazon uses to run its own global network of websites.
- The service aims to maximize benefits of scale and to pass those benefits on to developers.
- Along with its simplicity, it also takes care of other features like security, scalability, reliability, performance, and cost.
- Thus, Amazon S3 is a highly scalable, reliable, inexpensive, fast, and also easy to use service that meets design requirements and expectations.
- Amazon S3 provides a highly durable and available store for a variety of content, ranging from web applications to media files.
- It allows users to offload storage where one can take advantage of scalability and pay as-you-go pricing.
- For sharing content that is either easily reproduced or where one needs to store an original copy elsewhere, Amazon S3's Reduced Redundancy Storage (RRS) feature provides a compelling solution.
- It also provides a better solution in the case of storage for data analytics.
- Amazon S3 is an ideal solution for storing pharmaceutical data for analysis, financial data for computation, and images for resizing.
- Later this content can be sent to Amazon EC2 for computation, resizing, or other large-scale analytics without incurring any data transfer charges for moving the data between the services.

- Amazon S3 offers a scalable, secure, and highly durable solution for backup and archiving critical data.
- For data of significant size, the AWS Import/ Export feature can be used to move large amounts of data into and out of AWS with physical storage devices.
- This is ideal for moving large quantities of data for periodic backups, or quickly retrieving data for disaster recovery scenarios.
- Another feature offered by Amazon S3 is its Static Website Hosting, which is ideal for websites with static content, including html files, images, videos, and client-side scripts such as JavaScript.

Amazon Simple Queue Service(SQS):

- Another service of AWS is Amazon SQS.
- It is a fast, reliable, scalable, fully managed message queuing service.
- SQS makes it simple and cost effective to decouple the components of a cloud application.
- SQS can be used to transmit any volume of data, at any level of throughput, without losing messages or requiring other services to be always available.
- Amazon SQS is a distributed queue system that enables web service applications to quickly and reliably queue messages that one component in the application generates to be consumed by another component.
- A queue is a temporary repository for messages that are waiting to be processed.
- Amazon SQS offers various features like allowing multiple readers and writers at the same time, providing access control facilities, guaranteeing high availability of sending, and retrieving messages due to redundant infrastructure.
- It also gives provision for having variable length messages as well as configurable settings for each queue.

8Q:What do you mean by Knowledge as a Service? Which company provides this service? Explain.

8A:

Service Cloud: Knowledge as a Service :

- Service Cloud refers to the service (as in customer service) module in Salesforce. com.
- It includes Accounts, Contacts, Cases, and Solutions.
- It also encompasses features such as the public knowledge base, web-to-case, call center, and self-service portal, as well as customer service automation.
- Service Cloud includes a call center–like case tracking feature and a social networking plug-in for conversation and analytics.
- The Service Cloud delivers the world's first enterprise-grade knowledge base to run entirely on an advanced, multi tenant cloud platform.
- That means one can get all the cloud computing benefits that Salesforce.com is known for delivering without expensive data centers or software.
- Just powerful knowledge management, without the hassle of on-premises software, is provided.

- Unlike stand-alone applications, this knowledge base is fully integrated with everything else.
- Service Cloud has to offer all the tools one needs to run the entire service operation.
- When the consumer's knowledge base is a core part of CRM solution, knowledge as a process can be managed.
- One can continually create, review, deliver, analyze, and improve the knowledge. And, because it is delivered by the Service Cloud, user's knowledge is available wherever other customers need it.
- Agents have the right answers at their fingertips to communicate over the phone, send out through an e-mail, or share via a chat client.
- The same knowledge base serves up answers to the service website is a part of company's public site.
- If one wants to take advantage of social channels like Twitter or Facebook, one can easily share knowledge that is tapped into the wisdom of the crowd to capture new ideas or answers.
- All this is done securely. The Service Cloud gives the tools that are needed to manage knowledge at enterprise scale.
- But it also delivers the same great ease of use that Salesforce. com is known for.
- That means users will benefit no matter what size or how complex the business is.

9Q:Explain the features of Aneka

9A:

Aneka Platform:

- Aneka provides a set of services that make enterprise cloud construction and development of applications as easy as possible without sacrificing flexibility, scalability, reliability, and extensibility.

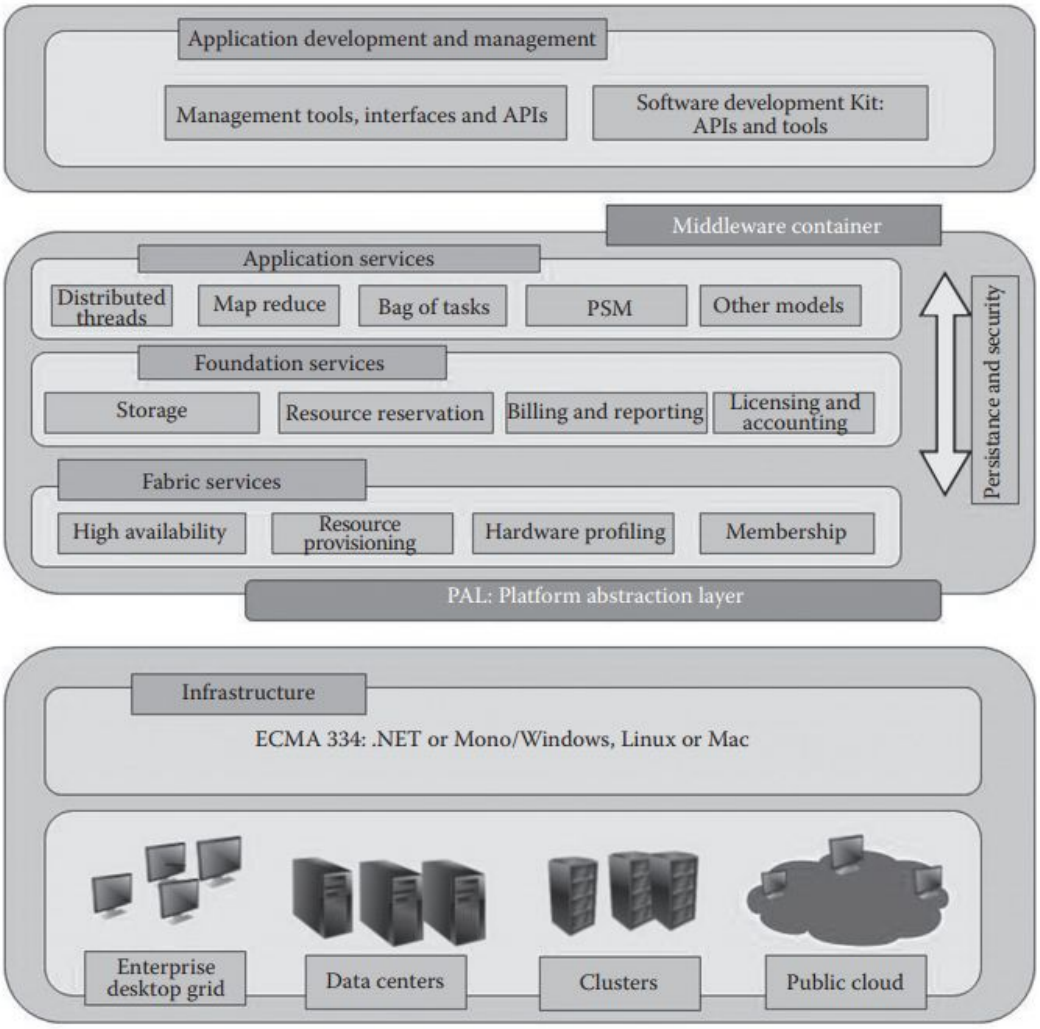

FIGURE 11.5
Overview of the Aneka platform. (Adapted from http://www.manjrasoft.com/aneka_architecture.html, accessed January 8, 2013.)

- Figure 11.5 gives an overview of the Aneka platform.
- The key features supported by Aneka are as follows:
- 1. A configurable and flexible execution platform (container) enabling pluggable services and security implementations.
- Multiple authentication/ authorization mechanisms such as role-based security and Windows domain–based authentication are considered for this purpose.
- 2. Multiple persistence options including Relational Database Management System (RDBMS), Structured Query Language (SQL) Express, MySQL, and flat files.
- 3. Software development kit (SDK) supporting multiple programming models including object-oriented thread model, task model for legacy applications, and MapReduce model for data-intensive applications.
- 4. Custom tools such as Design Explorer for parameter sweep studies.

- 5. Easy to use management tool for SLA and Quality of Service (QoS) negotiation and dynamic resource allocation.
- 6. Supports deployment of applications on private or public clouds in addition to their seamless integration.
- Aneka allows servers and desktop PCs to be linked together to form a very powerful computing infrastructure.
- This allows companies to become energy efficient and save money without investing in a number of computers to run their complex applications.
- Each Aneka node consists of a configurable container that includes information and indexing, scheduling, execution, and storage services.
- Aneka supports multiple programming models, security, persistence, and communications protocols.

10Q: What is vmware? Explain in brief.
10A:
VMware :

- VMware, a leader in virtualization technology, has come up with enterprise cloud computing solutions.
- Having been a dominating player in the virtualization domain, VMware is currently providing a range of products for the development of private and public clouds and for leveraging the services offered by both as a hybrid cloud, such as VMware vCloud Director, VMware vCloud Datacenter Services, VMware vSphere, and VMware vShield to name a few.
- Private clouds enable the better usage and management of internal IT infrastructure than the traditional methods.
- Greater operational efficiency, secure, fault-tolerant, well-managed computing environments can be modeled and operated.
- VMware's private cloud offering provides greater standardization, rapid provisioning, and self-service for all applications and unparalleled cost savings by consolidating their physical infrastructures.
- VMware's modular technology enables the user to select from a variety of hardware, software, and certified service providers to result in efficient cloud computing.
- Thus, the family of products offered by VMware promotes compatibility and retains the choice of freedom for the users to obtain desired services.
- Private clouds can be created by using the VMware vSphere and VMware vCloud Director.
- VMware vSphere is a robust virtualization platform used to transform IT infrastructures into virtual storage, compute, and network resources and provide them as a service within the organization.
- VMware vSphere provides services at both the infrastructure and application levels.
- At the infrastructure level, it provides options to perform efficient operation and management of the compute, storage, and network resources.
- At the application level, service-level controls are provided for the applications running on the underlying infrastructures, leading to available, secure, and scalable applications.

- The VMware vCloud Director, coupled with VMware vSphere, is a software solution that enables enterprises to build secure, multi-tenant private clouds by pooling infrastructure resources into virtual datacenters and exposing them to users through web-based portals and programmatic interfaces as fully automated, catalog-based services.
- VMware vCloud Director abstracts the virtual computing environment from the underlying resources and provides a multitenant architecture that features isolated virtual resources, independent LDAP authentication, specific policy controls, and unique catalogs. VMware vShield technologies are used to provide security to these environments by using services like perimeter protection, port-level firewall, NAT and DHCP services, site-to-site VPN, network isolation, and web load balancing.
- The VMware vCloud Director allows users to catalog infrastructure and application services of the desired configurations and deploy and consume them as needed.
- Interactions with the virtual data centers or the catalogs are through a user-friendly web portal or the vCloud API. The vCloud API is an open, REST-based API that provides scripted access, complying with the open virtualization format (OVF).
- The API can be used along with VMware vCenter Orchestrator to automate and orchestrate operational processes like routine tasks, activities, and workflows. Public and hybrid cloud solutions are provided by VMware by partnering with other companies, certified as service providers.
- VMware vCloud Datacenter Services and VMware vCloud Express offer efficient solutions for utilizing IaaS either as a public cloud or a hybrid cloud.
- vCloud Datacenter Services provides a scalable environment, where internal resources are augmented with the external resources.
- vCloud Datacenter Services are built on the same technology and foundations as VMware vCloud Director and VMware vSphere to enable interoperability between cloud environments.
- Thus, the user is free to burst his private cloud into the public cloud of his preferred service provider.
- vCloud Express is an IaaS offering delivered by leading VMware service provider partners.
- It is a co branded service that provides reliable, on-demand, pay-as-you-go infrastructure.
- The VMware vCloud Express providers are Virtacore vCloud Express, Hosting.com, Melbourne IT, and Terremark’s vCloud Express. Instance types, load balancing, storage options, and pricing vary between service providers.