Getting Started with Citrix® CloudPortal™

Get acquainted with Citrix Systems® CPSM and CPBM in order to administer cloud services smoothly and comprehensively

Puthiyavan Udayakumar
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**Puthiyavan Udayakumar** has more than five years’ IT experience of expertise in Citrix®, VMware, and Microsoft products. Puthiyavan has extensive experience in designing and implementing virtualization solutions using various Citrix® and VMware products. He is an IBM certified Solution Architect and Citrix® certified Enterprise Engineer along with 15+ certifications in infrastructure products. Puthiyavan holds a Master of Science Degree in System Software from Birla Institute of Technology and Science, Pilani and IEEE Pattern and National award from the Indian Society for technical education.

I dedicate this book to my beloved mom, Dr. K. Managaikarasai, to my dad, Dr. P. Udayakumar, and to my bro, Kathiravan U.
Jakir Hayder graduated with Computer Science from South East University and is currently pursuing his MS in Computer Science and Engineering from North South University in Bangladesh. He has been building websites and social networking apps since 1999. He has been developing Facebook apps since 2007. He gave a talk at Facebook Developer Garage, Dhaka. He has developed websites with deep integration with Facebook, Twitter, LinkedIn, and YouTube API. He writes tests with RSpec, Cucumber, and Capybara, with Selenium. He follows agile methodologies of software development and he is specially fond of Scrum and stand-up. Beside his full-time job, Jakir writes his blog at blog.jambura.com. He can be followed on Twitter @jakirhayder and by using his LinkedIn profile bd.linkedin.com/in/zakirhyder. Jakir Hayder lives in Bangladesh with his wife, Fathema and his son, Arham.

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I would like to thank my wife for taking care of my three-month old boy day in and day out, while I reviewed the book and did my job. I would also like to thank Apeksha Chitnis for being patient with me.
Aviad Ravivash was born and raised in the southern tip of Israel. He developed auto-didactic skills in order to satisfy his passion for IT and technology infrastructures.

These acquired skills led him to a variety of positions, including the one at Neocleus (later acquired by Intel), where he served as an IT admin for this virtualization research and development company.

With the aid of the unbelievable talent in the company, in the form of seasoned Linux/Unix admins and top-class Linux kernel developers, all working in Agile methodologies and developing for both the consumer and enterprise markets, he was able to take a pragmatic look at the art and business of IT.

He has an MCSE certification and a Bachelor's Degree in Engineering with specialization in Power Electronics.
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You are aware that cloud computing will generate some 14 million new jobs worldwide by 2015, according to a study commissioned by Microsoft and conducted by International Data Corporation (IDC).

Cloud computing enables the world of business to reduce IT costs, increase scalability, provide business continuity, and fulfill the needs on demand for IT resources on demand with self-provision functionality.

Citrix® CloudPortal™ Business Manager and CloudPortal™ Services Manager are emerging as the leaders in cloud, with a crystal clear objective of providing anything as a service. As you go through chapter by chapter, for sure you will get an insight of both the products and their essential functionalities.

What this book covers

Chapter 1, Getting Started with Citrix® CloudPortal™, serves as a quick reference for readers new to CloudPortal™ features, such as architecture, system requirements, planning CPSM deployment, and platform.

Chapter 2, Installing CloudPortal™ Services Manager 11.0, serves as a brief reference for readers to understand about the system, to verify the essentials, and install and configure CPSM using GUI and CLI.

Chapter 3, Deploying CloudPortal™ Services Manager 11.0, serves as a brief reference for readers to get an overview of services such as Citrix® service deployment, VM service deployment, and Hosted Exchange service deployment.

Chapter 4, Managing CloudPortal™ Services Manager 11.0, serves as a brief reference for readers to get an overview of managing customers, users, security roles, managing reports, and provisioning changes.
Chapter 5, *Installing CloudPortal™ Business Manager 2.0*, serves as a brief reference for readers to understand system requirements, how to install and configure CPBM, and starting and stopping CPBM.

Chapter 6, *Managing CloudPortal™ Business Manager 2.0*, serves as a brief reference for readers to understand profile management, product management, workflow management, account management, and billing.

Chapter 7, *Operating CloudPortal™ Business Manager 2.0*, serves as a brief reference for readers to understand operating CPBM.

**What you need for this book**

The following is a list of software required for deployment of CPBM and CPSM:


**Who this book is for**

This book will help people who are actively looking for jobs in the IT industry, as well as people working in the IT industry. It is of great help to people who want to be skilled in Citrix® CloudPortal™ usage. Here are other roles for which this book will be essential:

- Citrix® CloudPlatform Administrator, Engineer, Architect
- Citrix® CloudPortal™ Administrator, Engineer, Architect
- Cloud Administrator, Engineer, Architect

**Conventions**

In this book you will find a number of styles of text that distinguish between different kinds of information. Here are some examples of these styles, and an explanation of their meaning.

Code words in text are shown as follows: "We can include other contexts through the use of the include directive."
Any command-line input or output is written as follows:

```
CortexConfigConsole.exe/ConfigFile:XML-file /Configure: Objects /task-options [/Help]
```

**New terms** and important words are shown in bold. Words that you see on the screen, in menus or dialog boxes for example, appear in the text like this: "clicking the **Next** button moves you to the next screen".

Tips and tricks appear like this.

---

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Preface

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You can contact us at questions@packtpub.com if you are having a problem with any aspect of the book, and we will do our best to address it.
Thank you for choosing the right book to get a technical insight into Citrix CloudPortal. Throughout this book, you are going to learn about two different products from Citrix Systems: Citrix CloudPortal Business Manager (CPBM) and Citrix CloudPortal Service Manager (CPSM). In a nutshell, CloudPortal is an all-inclusive portal for provisioning services on demand from the cloud.

In this chapter we will discuss the following topics:

- Cloud computing and its business model
- Features of CloudPortal
- CloudPortal architecture
- Terminology of CPSM
- System requirements of CPSM and CPBM
- Planning our CPSM deployment and platform

Cloud computing and its business model

Before we start with Citrix CloudPortal, let us understand what cloud computing is and how its business model works.

Cloud computing

Cloud computing is a solution that provides "Computing as a Service" over the Internet and delivers on-demand computing resources. Resources include everything from desktop to data center and the most essential characteristics of every cloud product are self-service, pay-for-use, elastic resources, and so on.
Citrix CloudPortal fulfills the characteristics of cloud such as self-service, pay-as-you-go, on-demand, and so on.

Cloud business model
Cloud computing services are defined and classified into three major categories: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).

Citrix CloudPortal fulfills the needs of Cloud IaaS with CPSM and CPBM.

Overview of Citrix® CloudPortal™
I believe that by now you're very excited to know about CloudPortal. Let us now look at the basic functionality of Citrix CloudPortal.

Citrix CloudPortal is a product from Citrix Systems Inc. As a product, it aims to fulfill the cloud computing essentials, such as automated operations, business support for cloud providers, and cloud services delivery platform for self-service IT.

- **CloudPortal Business Manager (CPBM):** This wide-ranging business operations product qualifies cloud builders to run any cloud through all-inclusive cloud services platforms. This is coupled with consumer management, provisioning services, and operational features for running a cloud. IT consumers can combine any cloud, IT services, or value-added services, and qualify consumers to provision services themselves, while running accounts through a trouble-free, self-service portal. The flexible architecture makes it effortless to deliver a broad array of in-house, off-premise, and third-party cloud services, while being joined together with current business services and service models.

- **CloudPortal Services Manager (CPSM):** This user-friendly web portal helps service providers manage the delivery of cloud services and offerings to their clients. It also converts cloud offerings into money-spinning cloud businesses with all-inclusive platforms to manage business services, operations support services, clients, and cloud offerings. It provides out of the box support for Desktop as a Service (DaaS) and Windows apps (powered by Citrix® XenApp®/XenDesktop®), as well as popular business applications such as Lync, Exchange, Office, SharePoint, web hosting, and more. With no IT expertise, customers can add, remove, or modify any service.
Features of Citrix® CloudPortal™

Hopefully, now we have set the tone of what Citrix CloudPortal is all about and also had a peek into CPBM and CPSM. Now it is time to explore more features of both CPBM and CPSM.

The following features are defined by Citrix Systems for CPBM:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud services automation</td>
<td>A feature that helps to orchestrate and automate the formation of provisioning and modification of cloud services. It is robustly run, and delivers instances of cloud solutions as ITaaS.</td>
<td></td>
</tr>
<tr>
<td>Business and operations systems automation</td>
<td>A feature that helps to globalize consumer management, CRM, BOM, pricing, reporting, and IT as a service into a single, all-inclusive services delivery platform. This framework makes it easy to plug in to existing (in-house) and external (off-premise) business systems.</td>
<td></td>
</tr>
<tr>
<td>Simple management interface</td>
<td>A feature that enables things to run more easily on the cloud by using a single interface for cloud provisioning services, managing consumers, monitoring, and reporting.</td>
<td></td>
</tr>
<tr>
<td>Customer relationship management</td>
<td>A feature that helps to define the norms of account types such as staffs, business units, and try-out accounts to control services and utilities that are available for it. It uses CRM tools to open/view tickets, track activity, and reports.</td>
<td></td>
</tr>
<tr>
<td>Cloud services catalog</td>
<td>A feature that helps to create a custom instance of services including cloud-IaaS, 3rd Party, and ITaaS, which are delivered to users through a self-service instance.</td>
<td></td>
</tr>
<tr>
<td>Infrastructure-as-a-Service management</td>
<td>A feature that helps to deliver and run cloud-IaaS built with Citrix CloudPlatform power-driven by Apache CloudStack. Hypervisor provision includes XenServer, vSphere, Oracle VM, and Linux KVM. Consumers are allowed operations such as add, start, and stop virtual machines, allocate storage, and configure networking settings.</td>
<td></td>
</tr>
<tr>
<td>Custom pricing and packaging</td>
<td>A feature that helps to fit rising price summits, packages, and utilization models for different consumers/cloud users.</td>
<td></td>
</tr>
<tr>
<td>Extensible platform</td>
<td>A feature that helps to effortlessly deliver any service from CloudPortal using the SDK, working along with partners, and stretch our portfolio of services to differentiate and boost values.</td>
<td></td>
</tr>
</tbody>
</table>
### Feature | Service | Description
--- | --- | ---
**Self-service IT** | Self-service provisioning | A feature that helps users to simplify and gain an insight to purchase cloud services, quickly provision services, lower operational costs, and achieve higher user satisfaction.

**Metering and reports** | Metering and reports | A feature that helps to get synchronized access to service utilization, billing, and reports through a single insightful dashboard.

**Complete cloud visibility** | Complete cloud visibility | A feature that helps consumers with a solo, global view of their cloud services, ease of use, system health, performance and consumer utilization, pricing, helpdesk, alerts, and so on.

**Delegated control** | Delegated control | A feature that helps CloudPortal consumers to perform day-to-day management without calling support or opening support tickets, with lower operating costs.

**Pricing, metering and billing** | Billing and payments | A feature that helps CloudPortal administration to configure pricing models such as monthly subscriptions, fractional pricing, and pay-as-you-go, and then robotically calculate the usage, generates invoices, and routes to payments.

**Metering and monitoring** | Metering and monitoring | A feature that helps to track service usage with instantaneous reports and proactively watches over a system's health with integral alerts. It generates customized reports for current and historical activity with deep-dive analytics.

**Fraud protection** | Fraud protection | A feature that helps to prevent fake actions with integral account certification: password policies, domain white/black citation, and account spend limits. 3rd Party plugins are also supported.

**Open by design** | Cloud Service SDK | A feature that helps to deliver custom put up, 3rd Party, and IT as a Service from your Services catalog via SDK. You can configure, provision, meter, and bill services flawlessly.

**Partner ecosystem** | Partner ecosystem | A feature that helps to influence associate ecosystems to easily add differentiating cloud services such as monitoring, capacity management, Storage as a Service, and Platform as a Service to extend the value of your cloud.
CloudPortal Services Manager mechanizes the business and operations systems, and simplifies the cloud provisioning services. The following table enumerates the features defined by Citrix Systems for CPSM:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workflow approvals</td>
<td>A feature that helps to define workflow policy for new account activations and provisioning to ensure that the business unit requirements and financial plan approvals are met.</td>
<td></td>
</tr>
<tr>
<td>Role-based access control</td>
<td>A feature that helps to farm out administration responsibilities by mapping AD users and groups to CloudPortal profiles.</td>
<td></td>
</tr>
<tr>
<td>AD integration</td>
<td>A feature that helps to incorporate with AD to qualify the provisioning services based on the AD users and groups.</td>
<td></td>
</tr>
<tr>
<td>Business and operations system integration</td>
<td>A feature that helps to modernize IT, business, and operations by integrating them with existing systems such as help desks, trouble tickets, and chargebacks.</td>
<td></td>
</tr>
<tr>
<td>Account on boarding and management</td>
<td>A feature that helps to set up new consumers and manage consumer accounts from a simple web portal. CRM capabilities let you view/update customers in sequence, monitor actions, and perform report handling. Different consumer account types can be set up for customers, partners, resellers, and trial accounts as well.</td>
<td></td>
</tr>
<tr>
<td>Customer self-service and delegated control</td>
<td>A feature that helps to empower our clients with self-service control that’s trouble-free for anyone. Consumers can shop for the cloud services they want, and perform day-to-day management without calling support. Delegated access ensures the right level of organization for all cloud consumers, resellers, and partners.</td>
<td></td>
</tr>
<tr>
<td>Extensible and open architecture</td>
<td>A feature that helps to extend CloudPortal Services Manager to fit in our entire cloud portfolio and services using the SDK, commerce APIs, and 3rd Party apps and plugins.</td>
<td></td>
</tr>
<tr>
<td>Dashboards, metering, and billing</td>
<td>A feature that helps to give consumers and partners a complete view into their cloud so they can track usage, view available services, watch over a system’s health, and receive warnings. Concurrent and historic reports with deep-dive analytics make it easy to create customer, reseller, and partner reports. Billing modules can robotically calculate the usage, generate Bill of Lading, and process the payments.</td>
<td></td>
</tr>
</tbody>
</table>
Cloud services and IaaS automation

A feature that helps to automate association, provisioning, and add/move/change of our cloud portfolio. CloudPortal Services Manager lets you deliver and run a complete hosting solution, including cloud infrastructure, enterprise and livelihood requests, desktops, and IT services.

Built-in support for leading hosted services

A feature that helps to run a complete cloud services solution including messaging and collaboration, VDI, and venture line-of-business applications.

Citrix support

Citrix XenApp® - hosted apps and desktops

3rd Party applications

Microsoft hosted Microsoft Exchange, Lync, Office Communication Server, SharePoint Services, Dynamics CRM, Dynamic Datacenter, and BlackBerry Enterprise Server

Infrastructure and datacenter services

Microsoft Active Directory and synchronization

Windows File Shares

Microsoft IIS: Web hosting

Microsoft SQL: Data hosting, DNS

Citrix® CloudPortal™ architecture

As we have now understood the various features of CloudPortal, let us move on to the next section to understand the skeleton structure of CPBM.

How CPBM works

CloudPortal Business Manager is a cloud services delivery platform for access and authorization, service catalogs, self-service fulfillment, and helpdesk support. Cloud providers can deliver a broad array of services, including cloud-IaaS constructed with Citrix CloudPlatform, and it enables the features of catalog management, user management, workflow management, and metering management both for on-premise and off-premise cloud admins.
The following table has an explanation of the use for each component from a user's/customer's standpoint:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access and Authorization</td>
<td>This functionality helps consumers to self-register on portals; authorization requirements are confirmed and offered services are robotically mapped to the registered account.</td>
</tr>
<tr>
<td>Service Catalog</td>
<td>This functionality helps consumers to browse through the self-service portal to catalog, view pricing options, and pick up the options of services they need.</td>
</tr>
<tr>
<td>Self Service Fulfillment</td>
<td>This functionality helps to provision services, backend businesses, and helps operational workflows to be robotically triggered as well, without waiting or any manual intermediation by cloud workers.</td>
</tr>
<tr>
<td>Helpdesk Support</td>
<td>This functionality helps consumers to open tickets and interact with the support team using the built-in CRM support.</td>
</tr>
</tbody>
</table>
The following table has explanations of the use of each component from an administrator's/cloud worker's standpoint:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalog Management</td>
<td>This functionality helps to tailor services wrapped and hustled by fitting price and utilizations replicas. This defines the readiness for different user forms and business units.</td>
</tr>
<tr>
<td>User Management</td>
<td>This functionality helps to set account types, run users, monitor accounts and service tasks, and respond to support tickets. Users perform their own additions/moves/changes without calling IT.</td>
</tr>
<tr>
<td>Workflow Management</td>
<td>This functionality helps to automate and orchestrate provisioning of service and business systems and workflows operations, as well as define normalization rules for account tasks and provisioning service needs.</td>
</tr>
<tr>
<td>Metering Management</td>
<td>This functionality helps to track usage/consumption, produce invoices, and systematize payment processing.</td>
</tr>
</tbody>
</table>

CPBM architecture defined by Citrix Systems from a technical standpoint
Here, I would like to share some information about cloud computing. It is transforming the industry and catching the attention of business and IT leaders, forcing them to re-examine their IT strategies and identify ways to modernize, distinguish, and gain proficiency in their IT societies. Today, many enterprises are gradually turning to hybrid clouds to combine the benefits of constructing public and private clouds, along with using current IT infrastructure to cut charges, maximize significance, and improve the way IT services are supplied.

With Citrix's market-leading CloudPortal solutions, we can quickly and effortlessly convert the virtualized data center resources into robotic, elastic, self-service clouds that ensure the best performance, security, and reliability whether they are running in on-premise or off-premise datacenters.

If you are interested in learning more about these hybrid cloud solutions offered by Citrix, please refer to http://www.citrix.com/solutions/hybrid-cloud/overview.html.

Now, let us jump back to exploring the architecture of CPSM.

**How CPSM works**

Citrix CloudPortal Services Manager product is a multi-occupier, self-service portal offering simple workflows for on-boarding consumers, clients, and resellers. It also offers provisioning services, a catalog of cloud offerings for infrastructure, and the enabling of self-service and billing usage.

![CPSM architecture defined by Citrix Systems from a functional standpoint](image-url)
The following table has explanations of each component's usage from a consumer's/user's standpoint:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onboard Account</td>
<td>This functionality helps to add new consumers, clients, partners, or resellers by robotically processing the business services and operational services required to manage accounts.</td>
</tr>
<tr>
<td>Provisioning Services</td>
<td>This functionality helps to configure a catalog of cloud aids for hosted apps, servers, desktops, IaaS, and robotically provision them to your consumers.</td>
</tr>
<tr>
<td>Qualify Self Services</td>
<td>This functionality helps to empower consumers with self-service controls so that they can run their accounts.</td>
</tr>
<tr>
<td>Usage and Billing</td>
<td>This functionality helps to produce customized real-time and historic consumption reports with deep-dive analytics to better recognize usage patterns.</td>
</tr>
</tbody>
</table>

CPSM architecture defined by Citrix Systems from a technical standpoint
About CPSM licensing
CloudPortal Services Manager license is obtainable exclusively to Citrix Service Provider partners via certified Citrix Service Provider Distributors. Citrix CloudPortal Services Manager aids cloud suppliers in consumption-based licensing, empowering billing on a monthly basis for the services they consume.

CloudPortal Services Manager is completely free to affiliates of the Citrix Service Provider Program. The program is free for Enterprise customers to join. All they have to do is to reach out to their local Citrix Service Provider.

Terminology and concepts of CPSM
By now, I believe you will have understood the architecture of CPBM and CPSM from a functional and technical standpoint. Now, let us look at the terminology and concepts of CPSM. The following table explains the terminologies versus their notions:

<table>
<thead>
<tr>
<th>Terminology</th>
<th>Notion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Directory Location Services</td>
<td>Active Directory Location Services refers to the level at which settings are configured for services that are qualified for a particular location. By default, services deployed within a location inherit the settings configured at the top environment level.</td>
</tr>
<tr>
<td>Control panel</td>
<td>Control panel refers to the web-based interface that CSPs, resellers, and delegated administrators use to configure and run services and resources.</td>
</tr>
<tr>
<td>Customer administrator</td>
<td>Customer administrator refers to the first consumer created for a client. This consumer has permissions to create and modify consumer accounts and to provision services to consumers.</td>
</tr>
<tr>
<td>Customer plan</td>
<td>Customer plan refers to a collection of configured settings that apply to all customers provisioned with a specific service.</td>
</tr>
<tr>
<td>Location</td>
<td>Location refers to an Active Directory domain and is used to create links between specific services, clients, and consumers.</td>
</tr>
<tr>
<td>Provisioning</td>
<td>Provisioning refers to the process of fulfilling requests made to the engine for precise tasks such as creating customers, assigning security roles, and removing users.</td>
</tr>
<tr>
<td>Service provider administrator</td>
<td>Service provider administrator refers to the first administrator the user created, when the first location was created for the Services Manager deployment.</td>
</tr>
<tr>
<td>Top Environment Services</td>
<td>Top Environment Services refers to the level at which default settings are configured for the SM deployment. Settings configured at this level are inherited by all locations in the deployment.</td>
</tr>
</tbody>
</table>
The following are the system requirements of various components of CPSM:

- **Component**: Active Directory and Exchange requirements
  - **Security requirements**:
    | Group name (required for) | CPSM installation | Extending AD schema |
    |---------------------------|-------------------|---------------------|
    | Domain Admins             | Yes               | Yes                 |
    | Enterprise Admins         | No                | Yes                 |
    | Schema Admins             | No                | Yes                 |

- **DNS requirements**:
<table>
<thead>
<tr>
<th>Platform component</th>
<th>Alias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database server</td>
<td>CORTEXSQL</td>
</tr>
<tr>
<td>Provisioning server</td>
<td>CORTEXPROVISIONING</td>
</tr>
<tr>
<td>Web server</td>
<td>CORTEXWEB</td>
</tr>
<tr>
<td>Reporting Services</td>
<td>CORTEXREPORTS</td>
</tr>
</tbody>
</table>

Citrix specifies that before the Services Manager platform can be deployed, the AD schema must be extended to include the standard Exchange attributes and prepare the environment for multi-tenancy. You can extend the schema by executing the following command:

```
setup /p /on:OrganizationName
```

- **Component**: Database server requirements are as follows
  - **OS requirements**: Windows Server 2008 R2 Standard, Enterprise, and Datacenter editions
  - **DB requirements**: Microsoft SQL Server 2008 R2
° **Authentication**: Mixed mode must be qualified (SQL and Windows Authentication)

° **UAC**: Must be disabled

Citrix says that when you install SQL Server, make note of the instance name (default=default) and port (default=1433). We need this information when we configure the server for use with Services Manager.

The following DBs are created during the installation:

- **OLM**: The core database for customer and user information
- **OLMReports**: Stores legacy reporting data and some system settings
- **OLMReporting**: Stores reporting data, additionally, the upcoming SQL accounts are created for accessing the databases: CortexProp, OLMUser, OLMReportsUser, and OLMReportingUser.

Two SQL jobs are installed on the database server: Gather Daily Stats Data and Gather Monthly Stats Data.

- **Component**: Provisioning server requirements
  
  ° **OS requirements**: Windows Server 2008 R2 Standard, Enterprise, and Datacenter editions
  
  ° **.NET requirements**: .NET Framework 4.0
  
  ° **UAC**: Must be disabled
  
  ° **Windows features**: Qualify the following features: Message Queuing Server and HTTP Support (only if the server is not in the domain) features by navigating to Message Queuing | Message Queuing Services, and also the Telnet client, Windows PowerShell features

Citrix says that if you are installing the Provisioning server role on a domain controller, give the Provisioning Users security group the Allow logon locally permission. However, Citrix does not recommend installing Provisioning on domain controller.

SQL Server Management: Install the 64-bit variant of the Microsoft SQL Server 2008 Shared Management Objects (SMO).
• **Component:** Directory Web server requirements
  - **OS Requirements:** Windows Server 2008 R2 Standard, Enterprise, and Datacenter editions
  - **.NET requirements:** .NET Framework 4.0
  - **UAC:** Must be disabled
  - **Windows features:** Qualify the following features: the ASP.NET feature by navigating to *Web Server* | *Application Development*, the *Basic Authentication* and *Windows Authentication* features by navigating to *Web Server* | *Security*, the *IIS Management Console* and *IIS Management Scripts and Tools* features under *Management Tools*, and the *PowerShell 2.0* feature

Citrix says that Directory Web Service is installed on the same server that hosts the Provisioning server role. If you are installing the Directory Web Service on a domain controller, give the CortexWS Users and the Proxy Users groups the Allow logon permission locally. Citrix does not recommend installing this role on a Domain Controller.

• **Component:** Web server requirements
  - **OS requirement:** Windows Server 2008 R2 Standard, Enterprise, and Datacenter editions
  - **.NET requirements:** .NET Framework 4.0
  - **Report Viewer:** Microsoft Report Viewer 2008 SP1
  - **UAC:** Must be disabled
  - **Windows features:** Qualify the following features: the ASP.NET feature by navigating to *Web Server* | *Application Development*, the *Basic Authentication* and *Windows Authentication* features by navigating to *Web Server* | *Security*, the *IIS Management Console* and *IIS Management Scripts and Tools* features under *Management Tools*
  - **Web Browsers Supported:** Internet Explorer 8, 9, and 10, Firefox 17.x and 18.x, Chrome 25.x, Safari 5.x
Citrix says that during platform configuration, you will need to know the host header required for the website and when you install the web server role, the following items are installed:

- **CortexMgmt Application Pool**: Runs the management site.
- **Cortex Management Site**: CortexDotNet is the service that runs the control panel.
- **CortexAPI**: This is the XML-based web service that automates management tasks.
- **SQL Server Management Object**: Installs the 32-bit variant of the Microsoft SQL Server 2008 Shared Management Objects (SMO). This is available in the Support folder of the Services Manager installation media.

**Component**: SQL Server Reporting Services and Data Warehouse requirements

- **OS requirements**: Windows Server 2008 R2 Standard, Enterprise, and Datacenter editions
- **.NET requirements**: .NET Framework 4.0
- **DB requirements**: Microsoft SQL Server 2008 R2
- **Report Viewer**: Microsoft Report Viewer 2008 SP1
- **UAC**: Must be disabled
- **Service account**: SQL Reporting Services account must be Network Service
- **SQL connection types**: Local and remote SQL connections qualified

Verify that the Report Server configuration file (C:\Program Files\Microsoft SQL Server\MSRS10.MSSQLSERVER\Reporting Services\ReportServer\rsreportserver.config) contains the entry `<AuthenticationTypes><RSWindowsNTLM/>,<RSWindowsNegotiate/>,</AuthenticationTypes>`.
Citrix says that SQL Reporting service and data warehouse are deployed on the same server.

They need a user with a system administration role; we will need this sys admin info when we configure the Reporting platform role with the CPSM Configuration Tool.

CPSM setup installs Microsoft SQL Server 2008 Shared Management Objects automatically when the data warehouse role is deployed. SMTP is needed for the data warehouse.

The following table is a generic guideline for firewall expectations required to be set on the infrastructure:

<table>
<thead>
<tr>
<th>Traffic/Port</th>
<th>Sources</th>
<th>Target</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCP 8095</td>
<td>Web Server</td>
<td>Provisioning Engine</td>
<td>Helps to authenticate users and read-time AD lookups</td>
</tr>
<tr>
<td>MSMQ#, HTTP, or HTTPS</td>
<td>Web Server</td>
<td>Provisioning Engine</td>
<td>Helps to process provisioning requests</td>
</tr>
<tr>
<td>TCP 1433##</td>
<td>Provisioning Engine</td>
<td>SQL Server</td>
<td>Helps to access the provisioning guidelines write statistics</td>
</tr>
<tr>
<td>TCP 1433##</td>
<td>Web Server</td>
<td>SQL Server</td>
<td>Helps to access the customer and user material</td>
</tr>
<tr>
<td>TCP 80</td>
<td>Web Server</td>
<td>SQL Reporting Services server</td>
<td>Helps to access SQL Reporting Services</td>
</tr>
</tbody>
</table>

# MSMQ contains numerous ports, as stated by Microsoft
## Supported SQL uses TCP 1433 only for the default instance

The following are the system requirements for CPBM Server:

- **H/W**: Four vCPUs, 8 GB RAM with 40 GB HDD
- **OS**: CentOS release 5.6, 6.2, 6.3
- **Component**: Java 1.6 and above
- **SQL**: MySQL Server 5.1.x
- **Browser support**: Microsoft Internet Explorer 8 and 9, Mozilla Firefox 19, Google Chrome 25, Apple Safari 5/iOS 6.0.1.
Planning our CPSM deployment and platform

Hopefully, now you will have understood the system requirements from a technical standpoint. Let us now look at the strategic way in which we can plan our CPSM deployment and platform.

Citrix says that you can plan your deployment with a three-phased approach: Service management platform deployment as the first phase, Service deployment as the second phase, Customer and user provisioning as the third and last phase. In the upcoming chapter, you will understand how to apply this phased approach.

- **Service manager deployment phase**: The Services Manager platform characterizes a series of servers that accomplishes provisioning tasks, hosts the control panel interface, authenticates, manages consumers and API services, stores and processes data from the main database, and manages billing and usage.

- **Service deployment phase**: The installation of any service includes installing and configuring services for assets such as Citrix apps and desktops, Microsoft Exchange, and SharePoint. Before deploying any service, you must ensure the resources supporting the service are completely deployed.

- **Customer and user provisioning phase**: The provisioning of customers and users represents a series of tasks, such as empowering resellers to sell specific services, making these services accessible to end-clients, enabling client consumers to access services, and conveying security roles.

**Summary**

In this chapter, we have learned about CloudPortal and various features of CPSM and CPBM, the functional and technical architectures of CPSM and CPBM, the key technical system requirements of CPSM and CPBM, as well as approaches on planning the deployment and platform of CPSM.

In the next chapter, we are going to discuss how to verify system requirements for CPSM installation and configuration using GUI and command-line interface.
Installing CloudPortal™ Services Manager 11.0

With the knowledge gained in Chapter 1, Getting Started with Citrix® CloudPortal™, you would have understood the Citrix CloudPortal concepts and the system requirements to install it. Now let us look at the measures to verify system readiness before getting CPSM up and running.

In this chapter, we will learn the following:

- Metrics to verify before CPSM deployment
- Installing and configuring CPSM using GUI
- Installing and configuring CPSM using the command line

Metrics to verify before CPSM deployment

Until now, you have learned about the most obvious requirements to install CPSM; now, in the upcoming session, we will have a look at how to verify essentials for CPSM deployment.

Verification of environment prerequisites

We will look at the core components that should essentially be verified right at the outset before the installation.
The first component that needs to be verified is the Active Directory (AD) schema, which is necessary to accommodate Citrix CloudPortal Services Manager. As you are aware, the operation can be performed using the Microsoft Exchange installation tools.

The following steps need to be performed:

1. Open the command prompt on your planned Exchange server.
2. Then execute the following command:

   `setup /p /on:OrganizationName`

The second component that needs to be cross-checked is whether DNS aliases have been configured. Citrix CloudPortal Services Manager uses DNS aliases to discover the servers where the platform modules will be positioned. For this, the following steps need to be performed:

1. On AD, create CNAME records.
2. There should be one record against each of your servers as shown in the following table:

<table>
<thead>
<tr>
<th>Server</th>
<th>EX Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database server</td>
<td>CORTEXSQL</td>
</tr>
<tr>
<td>Provisioning server</td>
<td>CORTEXPROVISIONING</td>
</tr>
<tr>
<td>Web server</td>
<td>CORTEXWEB</td>
</tr>
<tr>
<td>Reporting Services</td>
<td>CORTEXREPORTS</td>
</tr>
</tbody>
</table>

Use the Citrix CloudPortal Services Manager Setup utility to verify the preceding items. The utility probes our settings and if it is positive, displays a green check mark next to each confirmed item. If it is negative, the Setup utility shows a Validate button, so you can execute the checks over again.

Perform the following steps:

1. From your file cluster or from the installation media, execute `Setup.exe`.
2. On the CloudPortal Services Manager splash screen, click on Get Started.
4. In the CloudPortal Services Manager screen, choose check environment prerequisites.
5. The Prepare Environment screen displays the status of the verified items.
As the next step, we will now create the system database.

The heart of the deployment is the Config.xml file, which will be useful throughout the wizard run-through.

How to deploy SQL Server and Reporting Services

For Cloud IT providers, it is recommended that they use the SQL Server deployment and Reporting Services. This should be done in a dedicated cluster for high availability, especially when providing for multiple consumers.


The next step is to create the DB.

We have to perform this activity post deployment of SQL Server and SQL Server Reporting Services. The system databases are created using the Services Manager Configuration Tool, which is installed as a part of this process.

Perform the following steps:

1. From the source location where the installation media is located, execute the Setup.exe file.
2. On the CloudPortal Services Manager splash screen, click on Get Started.
3. On the Choose Deployment Task screen, choose Install CloudPortal Services Manager.
4. On the Install CloudPortal Services Manager screen, choose Deploy Server Roles & Primary Location.
5. On the Deploy Server Roles & Primary Location screen, choose Create System Databases.
6. Now let us install the Citrix CloudPortal Services Manager Configuration Tool:
   1. When prompted, click on Install to deploy the Configuration utility.
   2. On the License Agreement screen, read and accept the license agreement and then select commit next.
   3. On the Ready to install screen, click on Install. The setup utility installs the Configuration Tool and the prerequisites that are required as well.
   4. Now, let us click on Finish to continue creating the system databases.

7. The next step of the installation is to create a Configuration File screen. Browse to the directory where you want to store the Config.xml file and provide a filename. Then click on Next.

8. Now, let us go to the Create Primary Databases screen and configure the following information about the SQL Server that will store system configuration information:
   ° Server address: This is used to specify the DB server using the DNS alias, IP address, or the FQDN.
   ° Server port: This is used to declare the port number used by SQL Server. The port for a default instance of SQL Server is 1433.
   ° Authentication mode: This is used to choose whether to apply Integrated Windows and SQL or SQL authentication. By default, Integrated is chosen. (Mixed Mode is recommended to be used).
   ° Connect as: This is used to declare Consumer name and password of the SQL administrator Consumer (Super account). Fields are accessible when we choose the SQL authentication mode for our installation.
   ° Auto-create SQL logins: This checkbox is available only if we want the required SQL Server Consumer accounts to be created automatically. If you do not choose this checkbox, we can later provide the login details manually on the Configure Database Logins screen.

9. Run through the Test Connection to make sure the Configuration utility can make contact with the SQL Server and then click on Next.
10. On the **Configure Database Logins** screen, proceed with **Generate IDs** chosen if you want passwords created automatically for CortexProp, OLMReports, and OLM DB accounts. Clear this choice if you want to provide the passwords for these accounts. CortexProp, OLM DB, and OLMReports accounts are formed to make sure the cross-domain right of entry is available to the server DBs.

11. On the **Summary** screen, assess the DB configuration in sequence. If you want to change anything, click on **Back** to return to the suitable configuration screen.

12. Upon completion of the entire configuration as per the guideline, go ahead and click on **Commit**. The **Applying Configuration** screen displays the progress.

13. After the server DBs are effectively created, click on **Finish**.

After the system databases are created, you can install Provisioning Directory Web Service and the web platform server roles on the other servers.

### Installation of the CPSM role using GUI

By now you would have crystal clear understanding of the system requirements for a CPSM installation. In order to start the installation using GUI, we need to perform the following activity on the server you will be using to host each server role you planned:

![deploy-reporting-server-role]

- Deploy and configure the Reporting server role after the primary location has been configured. If you deploy Reporting Services before the primary location has been configured, configuration of Reporting Services fails.

1. From the source location where the installation media is located, execute the **Setup.exe** file.

2. On the **Setup Tool** splash screen, click on **Get Started**.

3. On the **Choose Deployment Task** screen, choose **Install CloudPortal Services Manager** and click on **Next**.

4. Now on the **Install CloudPortal Services Manager** screen, choose **Deploy Server Roles & Primary Location** and click on **Next**.

5. Now on the **Deploy Server Roles & Primary Location** screen, choose **Install Server Roles** and click on **Next**.
6. Now on the License Agreement screen, agree to the license agreement and then click on Next.

7. On the Choose Server Roles screen, choose the roles to install and then click on Next.

8. On the Review Prerequisites screen, evaluate the prerequisite objects that will be deployed and then click on Next.

9. On the Ready to install screen, evaluate the chosen roles and prerequisites that will be deployed. Click on Install. The Deploying Server Roles screen shows the installation of the prerequisites and the chosen roles, and the outcome.


Configuration of parameters of CPSM roles using GUI

The configuration carries out a unique technique for each server role we deploy. However, some server roles consist of supplementary configuration choices. This topic assumes we have installed the server roles we want to configure; the Services Manager Setup utility is operating and displaying the Install Server Roles & Primary Location screen.

1. On the Deploy server Roles & Primary Location screen of the Setup utility, choose Configure Server Roles.

2. Now on the Load Deployment Configuration file screen, browse to the location where we have created the XML configuration file (or a directory), choose the XML file, and then click on Next.

3. Now on the Select Configuration task screen, select one or more roles to configure and then click on Next.

Role 1 – selecting role Directory Web Service and configuring Directory Web Service

The following parameters need to be configured:

- **Auto-generate IDs**: Select this choice to create the Directory Web Service account with auto-generated IDs.

- **Consumer name**: Provide the consumer name of a domain administrator for the service account. The default consumer name is cortex_dirws_svc. This field is not available if you select Auto-generate IDs.
• **Password**: Provide a password for this account that conforms to your domain's password policy. This field is not available if you select **Auto-generate IDs**.

• **Create if doesn't exist**: Select this to create a service account if it does not already exist, else provide your account.

• **Service port**: Provide the port that the Directory Web Service will use. By default, the port number is 8095.

### Role 2 – selecting role Provisioning Service and configuring queue monitoring services, directory monitoring services, and the Mail server

The following parameters need to be configured. Firstly, we need to configure queue monitoring services and directory monitoring services:

• **Auto-generate IDs**: Select this choice to produce the monitoring service account with auto-generated IDs. Ignore this choice to specify your own IDs for this account.

• **Consumer name**: Provide the consumer name of a domain administrator for the service account. For the Queue Monitor service, the default consumer alias is **cortex_qmon_svc**. For the Directory Monitor service, the default consumer alias is **cortex_dirmon_svc**. This field will not be available if you choose to auto-generate IDs.

• **Password**: Provide a password for this account that conforms to your domain's password policy. This field will be unavailable if you choose to auto-generate IDs.

• **Create if doesn't exist**: Select this choice to create a service account if it does not already exist, else provide your account.

For the Mail server setup, the following needs to be done:

• Specify the SMTP server address and port number the provisioning server will use to send e-mail messages, such as system updates to administrators, account notifications to end consumers, and usage reporting to Citrix. Click on **Test Connectivity** to ensure that the Configuration Tool can communicate with the SMTP server.
Role 3 – selecting role Reporter Mailer and configuring Licensing Reporting and Mail server for report mailers

To configure Licensing Reporting, the following parameters need to be set:

- **Customer ID**: Provide your Citrix customer ID.
- **Auto-generate IDs**: Select this choice to create the service account with auto-generated IDs.
- **Consumer name**: Provide a unique Consumer name for the service account. The default consumer name is `cortex_RM_svc`. This field is not available if you elect to auto-generate IDs.
- **Password**: Provide a password for this account that conforms to your domain's password policy. This field is not available if you choose to auto-generate IDs.
- **Create if doesn't exist**: Select this choice to create a service account if it does not already exist, else provide your account.

To configure the Mail server for report mailers, the following needs to be done:

- Specify the address and port number of the SMTP server that the Report Mailer server will use to send e-mail messages to administrators, end consumers, and Citrix. If you have previously configured SMTP settings for the provisioning server, the **Use shared mail settings** checkbox is selected by default.
- Additionally, specify the **From Address** that will be used to send e-mail messages. The default address is `ReportMailer@domain.com`.

Role 4 – selecting role reporting, configuring the Reporting DB, Mail server, and previewing the service package import, reporting database, Data Transfer notifications, Reporting Services Details, and Data warehouse service

For Reporting DB, the following parameters need to be configured:

- **Auto-generate IDs**: Choose this to create the Reporting Services account with auto-generated IDs.
• **Consumer name**: Provide a unique consumer name for the service account. The default consumer name is `OLMReportingConsumer` (provided by Citrix Systems).

• **Password**: Provide a password for this account that conforms to your domain's password policy. This field is not available if you elect to auto-generate IDs.

For configuring the Mail server, the following needs to be done:

• Provide the e-mail address and port number of the SMTP system that Reporting Services will utilize to trigger e-mails to Cloud Admin, Cloud Consumer, Cloud Clients, and to Citrix as well.

For the Service package import, the following needs to be done:

• Analyze (go through) the chosen service components that will be imported when Reporting Services is configured.

For the Reporting database, the following parameters need to be set:

• **Use primary database settings**: A choice should be made as to whether we want to configure a secondary DB server to hold the system reporting and pricing (billing).

• **Server address**: Provide FQDN, the IP address, or the DNS alias of the DB.

• **Use specific port**: The default port number is **1433**.

• **Authentication mode**: The DB authentication we want to use. Windows (in-built) is chosen by default. The SQL Server login for the reporting DB needs to be cross-domain for ease of access.

• **Connection IDs**: Provide a consumer name and password for the DB administrator. This field will be disabled in case the SQL authentication is not chosen.

• Click on **Test Connection** to confirm that the configuration tool can talk to the DB server.

For data transfer notifications, the following needs to be done:

• Provide source and target e-mail addresses for sending success and failure alerts.

• Data transfer activity sends e-mail notifications with the results of data warehouse operations. This permits administrators to respond quickly to disruptions in the reporting functionality.
For details on Reporting Services, the following parameters need to be set:

- **Report server URL**: Specify the URL of the reporting server as it becomes visible in the SQL Reporting Services Server Configuration Manager.
- **Consumer name and password**: Provide the IDs of the report server administrator consumer. The password for this consumer account should never expire in order to avoid probable service disruptions.
- Click on **Test Connection** to confirm that the configuration tool can talk to the reporting server.

For Data Warehouse Service, the following parameters need to be set:

- **Auto-generate ID**: Select this option to create the service account with automatically generated IDs. Leave this option cleared to stipulate our own ID for this account.
- **Consumer name**: Provide a unique consumer name for the service account. The default name is `csm_dataw_svc`.
- **Password**: Provide a password for this ID that conforms to our domain's password policy. This field will be unavailable if you choose to auto-generate IDs.
- **Create if doesn't exist**: Select this to create a service account if it does not already exist, else provide your account.
- **Service port**: Default port is 80, you can customize as well.
- **Data purge window (months)**: Select **Configure** and then specify the number of months after which older historical data should be deleted. For example, specify 84 to delete data that is older than seven years.

**Role 5: selecting a web role and configuring service package import and the web server**

For the service package import, the following needs to be done:

- Analyze (go through) the selected service components that will be imported when the Web Server role is configured.

For configuring the web server, the following parameters need to be set:

- **External address**: Provide an externally resolvable FQDN that can be reached. The default alias is `cortexweb`.
- **Binding IP**: Default that all IP addresses are built-in.
• **Use SSL**: Provide your Enterprise SSL Servers (if required); for POC/Lab, leave it unchecked.

• **SSL certificate**: Stipulate the SSL certificate you wish to utilize for the server.

• **Summary screen**: Evaluate the configuration information for the server role. If you want to modify something, return to the apt configuration page. When the summary contains the settings you want, click on **Commit**.

• **Post configuration completion**: Click on **Finish** to go back to the **Deploy Server Roles & Primary Location** screen.

### Configuring the location of the CPSM role using GUI

Configuring the primary location initializes the control panel, specifies service provider details, and provisions the first administrator. Configure the primary location once per deployment.

Perform the following steps for primary location configuration:

1. On the **Deploy Server Roles & Primary Location** screen, choose **Configure Primary Location** and then click on **Next**.

2. On the **Load Deployment Configuration File** screen, browse to the XML file you have stored, select it, and then click on **Next**.

3. On the **Specify Location Details** screen, enter the following information and then click on **Next**:
   - For the **Location Settings**, provide the **Name** and **Description** values for **Primary location**.
   - For the Customers' OU, provide the **OU name** and the display name for the top-level Client OU. The default OU name is **Consumer** and the default display name is **Client OU**.

4. On the **Enter Service Provider Details** screen, provide the following information and then click on **Next**:
   - For **Display Name**, provide the service provider's name.
   - For **Short Name**, enter a description of the display name.

5. For **UPN Suffixes**, enter one or more UPN suffixes to subordinate with the Active Directory in our infrastructure. This assists us in providing client or consumer user-specific UPN logons. The default UPN suffix is **csp.local**.

6. For **Contact name & email**, provide the name and e-mail ID of the **Primary contact for the location**.
7. On the Create First Administrator screen, enter the full name and login IDs for the top-level/Super administrator Consumer for the location, then click on Next.

8. On the Summary page, review the location settings and administrator information you provided. If you want to change anything, go back to the required screen. Upon finalization, click on Commit.

Perform the following steps for the remote location configuration:

1. From your file cluster or from the installation media execute Setup.exe and then click on Get Started.

2. From the Deployment Task screen, choose Add Services & Locations.

3. Now on the Add Services & Locations page, select Add Remote Location.

4. Now on the Configure Remote Location page, select Configure Location.

5. From the Load Deployment Configuration File screen, browse to the XML file you have stored, select it, and then click on Next.

6. On the Specify Location Name Details screen, provide the following information and then click on Next:
   - For the Location Settings, provide the Name and Description values for Primary Location.
   - For the Customers' OU, provide the OU name and the display name for the top-level Client OU. The default OU name is Consumer and the default display name is Client OU.

7. On the Summary page, review the location settings and administrator information you provided. If you want to change anything, go back to the required screen. Upon finalization, click on Commit.

**Installing CPSM roles using command line**

In the previous section, we have seen how to install CPSM using the GUI mode. Now it is time for us to learn about installing CPSM using the command line. Moreover, we would come across a term called Cortex in the command prompt which is explained in the following section.
Cortex
In February 2011, Citrix broadcasted that they have acquired the company called EMS Cortex. EMS Cortex offers varieties of products and solutions which are purely web-based controls, capable of integrating into a lot of products from Microsoft and Citrix, thereby making administration easy.

Core installation using CLI
Please execute the following command to install CPSM using the CLI:

CortexSetupConsole.exe /install: objects /Help

The following are the objects that required to be installed for each role:

- ConfigTool
- Provisioning
- DirectoryWebService
- Web
- Reporting
- ReportMailer

Perform the following steps:

1. Log on to the server with the administrator privilege.
2. Open Command Prompt via Run.
3. Execute the specific server role.

Configuring the CPSM role using command line
As the next step, we are going to configure the CPSM role using the command-line interface and the following syntax to configure the server:

CortexConfigConsole.exe/ConfigFile:XML-file /Configure: Objects /task-options [/Help]
Configuring database objects
Perform the following steps to configure database objects:

1. Log on to the server with the administrator privilege.
2. Open Command Prompt via Run.
3. Execute the following command to enable the DB server role:
   
   ```
   /CortexSql:DB_Name [DB_Name refers to SQL DB]
   /CortexSqlAuthMode:SQL|Windows [Option to set authentication mode]/
   CortexSqlUsername:username [Option to set DB Admin User ID]
   /CortexSqlPassword:password [Option to set DB Admin password]
   /CortexSqlPort:port [Option to set port no of SQL DB | Default :1433]
   /GenerateCortexSqlCredentials:True | False [In case option set to True, CortexProp, ExchangeLogs, OLMReports, and OLMUser SysDB IDs are generated robotically ]
   /CortexPropPassword:password
   /ExchangeLogsUserPassword:password
   /OlmReportsUserPassword:password
   /OlmUserPassword:password
   /GenerateConfigFile:XMLname [Option to set Location and file name for XML configuration file]
   ```

Configuring the Provisioning and Directory Web Service server roles
Perform the following steps to configure the Provisioning and Directory Web Service server roles:

1. Log on to the server with the administrator privilege.
2. Open the Command Prompt via Run.
3. Execute the following command to enabled the Provisioning and DBWS server role:

   ```
   ```
Chapter 2

Configuring the primary location
Perform the following steps to configure the primary location:

1. Log on to the server with the administrator privilege.
2. Open the Command Prompt via Run.
3. Execute the following command to enable the primary location:

   ```bash
   CortexConfigConsole.exe /ConfigFile:\server-name\config-file.xml /Configure:Location/PrimaryLocation:True /LocationName:My First Location /LocationOU:Organization-Name /LocationOULabel:My Organization /CspAdminPassword:password /CspContact:CSP-Name /CspContactEmail:cspadmin@my-org.com /CspUPN:my-org.com
   ```

Configuring the remote location
Perform the following steps to configure the remote location:

1. Log on to the server with the administrator privilege.
2. Open the Command Prompt via Run.
3. Execute the following command to enable the remote location:

   ```bash
   CortexConfigConsole.exe /ConfigFile:\server-name\config-file.xml /Configure:Location/PrimaryLocation:False /LocationName:My Second Location /LocationOU:Organization-Name /LocationOULabel:My Organization
   ```

Configuring the reporting options for deploying reports
Perform the following steps to configure the reporting options:

1. Log on to the server with the administrator privilege.
2. Open the Command Prompt via Run.
3. Execute the following command to enable reporting options for deployment reports:

   ```bash
   /ReportingServer:url [Report server unified resources location]
   /ReportsUserName:username
   /ReportsPassword:password
   /PublishReports:report[,report]... [Reports of various services such as Lync,Citrix Apps,Dns,Exchange, File Server,Billing, Metering, OCS etc...]
   /PublishAllReports:True | False
   ```
Configuring the reporting [Data warehouse] object
Perform the following steps to configure the reporting object:

1. Log on to the server with the administrator privilege.
2. Open the Command Prompt via Run.
3. Execute the following command to enable the reporting object:

   `/SuccessEmailFrom:address [Source Email ID for success notification]
   /SuccessEmailTo:address [Target Email ID for success notification]
   /FailureEmailFrom:address [Source Email ID for failure notification]
   /FailureEmailTo:address [Target Email ID for failure notification]
   /GenerateDataTransferCredentials:True | False
   /DataTransferUserName:username
   /DataTransferPassword:password
   /SmtpServer:address
   /SmtpServerPort:port`

Configuring the report mailer object
Perform the following steps to configure the report mailer object:

1. Log on to the server with the administrator privilege.
2. Open the Command Prompt via Run.
3. Execute the following command to enable the reported mailer object:

   `/CustomerId [Client ID]
   /ReportMailerEmailServer:name [SMTP Server Name]
   /GenerateUserCredentials:True | False
   /ReportMailerTaskUserName:username
   /ReportMailerTaskUserPassword:password
   /ReportMailerEmailServerPort:port [Default = 25]
   /ReportMailerEmailUserName:username
   /ReportMailerEmailPassword:password`
Summary
In this chapter, we learned about installing CPSM using GUI and CLI with a detailed step-by-step approach and also about the metrics to be verified prior to installation. In the next chapter, we are going to discuss how to deploy and support services on CPSM along with the deployment of service scenario, with a three-phased approach recommended by Citrix Systems.
Deploying CloudPortal™
Services Manager 11.0

In Chapter 2, Installing CloudPortal™ Services Manager 11.0, you will have obtained the knowledge to install and configure CPSM using the GUI and the command-line interface. Now let us learn about and explore deploying services using CPSM.

In this chapter we will learn about the following:

- An overview of CPSM service deployment
- Scenario 1: Citrix service deployment
- Scenario 2: Microsoft SharePoint Service deployment
- Scenario 3: VM Service deployment
- Exporting and importing service packages

An overview of CPSM service deployment

CPSM supports a variety of cloud services that can be provided to cloud consumers such as clients and resellers. CPSM Service deployment has a crystal clear workflow that has to be followed:

- **Step 1**: Install the service that to be provided
- **Step 2**: Configure the service that is to be provided
• **Step 3**: Provide the service to cloud consumers and cloud clients

Now let us look at the procedure to install the service. Before we get started with installing the service, some customization is required in place; that is, most of the services require web services to be installed mandatorily.

A list of services that require a web service is: ADFS (for use with the CRM 2011 service), Citrix XenApp, Hosted Exchange, Lync Enterprise, Lync 2010 for Hosting MySQL, Office Communication Server 2007, SharePoint 2010, Virtual Machine, and Windows Web Hosting. During the installation and configuration of the web service, the Service Manager Setup tool creates an IIS pool. Web applications and websites need to be configured so that the site works for cloud consumers.

By default, all the configuration files are stored in `C:\inetpub` on the server on which the web service is installed. Some services do not require a web service and only need the Control Panel configuration. These services are AD Sync, CRM, DNS, File Sharing, Archiving Mail, and Microsoft SQL Server DB Hosting.

Upon successful completion of installation, we need to follow a standard procedure for service configuration on CPSM. The following steps need to be performed:

1. Permit the service at the **Top environment** and **Location** levels.
2. Add IDs for accessing the **Servers** and **Management** tools.
3. Add the servers connected with **Service**.
4. Allocate service roles to the servers.
5. Add service associations to add the servers into CPSM.
6. Allocate the servers to a collection and arrange the service settings.
Once the service configuration is successfully completed, we can move on to the client provisioning in order to permit client and consumer plans. A condition must be fulfilled: we need to set the cloud Service Provider's Reseller service permitting them to stay at the Top environment and Location levels. After this, the consumer can provide services to clients.

If a service that is provided to consumers cannot be disabled at the Top environment level, it has to be de-provisioned from all consumers and resellers; after that, it can be deleted from the Location level.

Scenario 1 – Citrix® Service deployment

In this scenario of Citrix Service deployment, which uses a workflow approach (as recommended by Citrix Systems), let us understand the high-level approach to be followed for the deployment. Before that, from a support perspective, we need to keep in mind that XenApp is the only version that is supported. Most importantly, a Citrix web service component needs to be installed on all Citrix XenApp member servers that make hosted apps and desktops available for provisioning to users.


Citrix Service deployment overview on CPSM 11.0

Hopefully, by now you will have understood the high-level operations and essentials for CPSM to be deployed. Now let us go ahead and apply the same learning to the scenario of Citrix Service deployment. The following is a step-by-step approach to enable Citrix Services via CPSM:

- **Step 1**: Deploying Citrix web services on a server in the Citrix farm
- **Step 2**: Service Configuration using the Control Panel
- **Step 3**: Importing App Hub from the Citrix farm to the server collection
- **Step 4**: Providing the service to consumers
Step 1 – deploying Citrix® web services on a server in the Citrix® farm

Let us look at the step-by-step approach in deploying Citrix web services using CPSM:

1. From the Choose Deployment Task screen, choose Add Services & Locations.
2. From the Add Services & Locations screen, choose Install Services.
3. Read and accept the license agreement and then click on Next.
4. From the Web Services screen, choose Citrix Web Service and then click on Next.
5. From the Ready to install screen, review your choice and then click on Install.
6. After the installation, click on Finish.
7. From the Installed Services screen, click on Configure near the Citrix web service list item.
8. On the Configure IIS screen, provide the following information and then click on Next:
   - Auto-generate IDs: Choose this option to create a monitoring service account with autogenerated credentials. Leave this option cleared to specify your own credentials for this account.
   - User name: Provide a user ID for the Citrix web service account. The default username is csm_citrix_svc. This field is not available if you elect to autogenerate IDs.
   - Password: Provide a password for the Citrix web service account. This field is not available if you elect to autogenerate credentials.
   - Service port: Provide a port used by the Citrix web service. By default, the port is 8095.
9. On the Summary screen, review the configuration details. If you want to change anything, go back to the appropriate configuration screen. When the summary holds the settings we want, click on Next. Finally, the Configuration Tool configures the Citrix web service and shows the progress. Click on Finish upon completion.
Step 2 – Service Configuration using the Control Panel

Now that we have installed CPSM Citrix Web Services, let us take a step-by-step approach to configure Citrix web services using CPSM:

1. Permit the service from the Top and Location levels:
   For the Top level:
   1. Open Service Manager.
   2. Go to the menu bar.
   3. Navigate to Configuration | System Manager.
   4. Then choose Service Deployment.

   For the Location level:
   1. Open Service Filter.
   2. Choose AD Location Services.
   3. Then choose a value for Location Filter.

2. Examine IDs:
   1. Open Service Manager.
   2. Go to the menu bar.
   3. Navigate to Configuration | System Manager.
   4. Choose IDs; meanwhile, do ensure that the Admin account for Citrix Services is enabled.

   While adding IDs, we have to ensure that encryption is permitted on the console.

3. Enable the Citrix server:
   1. Open Service Manager.
   2. Go to the menu bar and navigate to Configuration | System Manager.
   3. Choose Servers (verify whether Citrix Server is enabled).
4. **Allocate server roles:**
   1. Open **Service Manager**.
   2. Go to the menu bar and navigate to **Configuration | System Manager**.
   3. Choose **Server Roles** and then expand the entry of the server.
   4. Under **Server Connection**, choose the **Citrix App** server and then click on **Save**.

5. **Add a server connection:**
   1. Open **Service Manager**.
   2. Go to the menu bar and navigate to **Configuration | System Manager**.
   3. Choose a server connection (choose a new connection).
   4. Options to be filled are shown in the following table:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server Role</td>
<td>Choose Citrix XenApp.</td>
</tr>
<tr>
<td>Server</td>
<td>Choose the Citrix XenApp member server where the Services Manager web service is installed.</td>
</tr>
<tr>
<td>Credentials</td>
<td>Choose the IDs for the Citrix XenApp member server.</td>
</tr>
<tr>
<td>Protocol</td>
<td>The default value is http.</td>
</tr>
<tr>
<td>Port</td>
<td>The default value is 8095. If you change the port here, change it in the Services Manager Web Service as well.</td>
</tr>
<tr>
<td>Timeout</td>
<td>The default value is 200000 MS.</td>
</tr>
</tbody>
</table>

5. Upon completion, click on **Save**.

6. Open **Service Manager**.

7. Go to the menu bar and navigate to **Configuration | System Manager**.

8. Choose **Server Connections** and click on the Test icon. The XenApp icon changes to green when the connection is successful and changes to red to indicate an unsuccessful connection.
6. Create a server collection:
   1. Open Service Manager.
   2. Go to the menu bar and navigate to Configuration | System Manager.
   3. Navigate to Server Collections | Filter and choose the relevant location from the record.
   4. Click on New Server Collection.
   5. Provide a name for the collection; we cannot change or delete a collection name after providing the server collection to a customer or after saving applications, application groups, or resources on the server collection.
   6. From the Service list, choose Citrix.
   7. From the Servers list, choose each Citrix XenApp member server to be managed under the server collection and then click on Save.

Step 3 – importing App Hub from the Citrix® farm to the server collection

After configuring the Citrix service, let us now take a step-by-step approach to import apps; in order to do so, perform the following steps:

1. Open Service Manager.
2. Go to the menu bar and navigate to Configuration | System Manager.
3. Choose Server Collections and then modify New Application Settings as required for the server collection.
4. Choose the Set new applications to default for customer option to automatically choose it for providing to customers and users. You can override this setting at the reseller level.
5. Choose the Make new applications public to all customers option to provide all new applications for public access.
6. Choose the Generate missing application groups option to automatically create a security group in the Active Directory for applications. The application group name is in the form of CitrixApp {DatabaseID} or CitrixApp {Name} based on the Application Group Name Service setting.
7. Click on **Refresh** to start the import operation.
8. If a time-out occurs during the import operation, change the **Timeout** value on the connection (**Configuration** | **System Manager** | **Server Connections**).
9. Reiterate steps 1 to 3 for each server collection.

### Step 4 – provisioning the service to consumers and to resellers

The final step of this scenario is to provide apps to the cloud consumers. In order to do so, perform the following steps:

1. From the **Services Manager** menu bar, click on **Customers** and choose the customer for whom you want to provide the services.
2. Choose **Services**. The **Customer Services** screen appears.
3. Click on the Citrix service name and a screen appears that allows you to grant access to Citrix applications.
4. Choose the server collection that the customer can use to access resources.
   
   ![Note] If only one server collection is available, only that collection’s resources appear. If multiple server collections are available, you can only configure one collection for the customer.

5. Choose the application groups, applications, and resources that the customer can access.
6. Click on **Provision** to enable the customer to provide Citrix services to users.

### Scenario 2 – hosted Exchange Service deployment

I hope Scenario 1 helped you understand about Citrix Apps as a service via CPSM. Now let us explore Exchange as a service using CPSM through the following steps:

- **Step 1**: Installing Exchange-hosted web services
- **Step 2**: Configuring the hosted web services
- **Step 3**: Providing the hosted Exchange service to consumers
Step 1 – installing Exchange-hosted web services

Exchange-hosted web services are installed on a system that hosts the Exchange Management console. We can now install the Exchange web service using either the GUI or the command-line interface.

Perform the following steps to do so:

1. Navigate to the Deployment Task screen and choose Add Services & Locations.
2. From the Add Services & Locations screen, choose Install Services.
3. Read and accept the license agreement and click on Next.
4. Go to the Web Services screen, choose Exchange Web Service, and then click on Next.
5. From the Ready to install screen, click on Install. The Deploying Server Roles screen displays the installation progress.
6. After the installation finishes, click on Finish.
7. From the Installed Services screen, click on Configure next to the Exchange web service list item.
8. From the Configure IIS screen, provide the following info and then click on Next:
   - **Auto-generate IDs**: Choose this option to create the monitoring service account with autogenerated credentials. Leave this option cleared to specify your own credentials for this account.
   - **User name**: Provide a user ID for the Exchange web service account. The default username is csm_exchange_svc. This field is not available if you elect to autogenerate IDs.
   - **Password**: Provide a password for the Citrix web service account. This field is not available if you elect to autogenerate credentials.
9. Keep the Create if doesn’t exist checkbox selected to allow the web service account to be created if it does not already exist in AD.
10. Use Service port to provide the port to be used by the Exchange web service. By default, the port is 8095.
11. On the Exchange Deployment Details screen, provide the following information and then click on Next:
   - **Exchange version:** Choose the version of Exchange that is deployed in your environment.
   - **Mixed-mode deployment:** Choose this checkbox if your Exchange deployment includes servers running different versions of Exchange.
   - **Preferred domain controller:** Provide the FQDN of the domain controller you want to use with the web service.
   - From the Configure Exchange for Multi-Tenancy screen, choose Apply multi-tenancy permissions to ensure customers will be isolated appropriately when the Exchange service is provided to them. Then click on Next.

12. From the Summary screen, review the configuration information. If you want to change anything, return to the appropriate configuration screen. When the summary contains the settings you want, click on Next. The Configuration tool configures the Exchange web service and displays the progress.

13. Click on Finish and then click on Exit to close the Configuration Tool.

### Step 2 – configuring hosted web services

1. Permit the service from Top and Location levels.
   - For the Top level:
     1. Open Service Manager.
     2. Go to the menu bar.
     3. Navigate to Configuration | System Manager.
     5. Expand Hosted Exchange.
     6. Choose User Plan, provide a name for it, and click on Create.
     7. Choose Consumer Plan, create a customer plan, click on Create, and save it.
   - For the Location level:
     1. Open Service Filter.
     2. Choose AD Location Services.
     3. Then choose a value for Location Filter.
     4. Expand Hosted Exchange and save it.
2. Examine IDs:
   1. Open Service Manager.
   2. Go to the menu bar and navigate to Configuration | System Manager.
   3. Choose IDs; in between, do ensure that the Admin account for Citrix Services is enabled.

   ![While adding IDs, we have to ensure that encryption is permitted.]

3. Enable the Exchange server:
   1. Open Service Manager.
   2. Go to the menu bar and navigate to Configuration | System Manager.
   3. Choose Servers (verify whether Citrix Server is enabled).
   4. Verify whether the Citrix Server is enabled and then choose Enable Server accordingly.

4. Allocate server roles:
   1. Open Service Manager.
   2. Go to the menu bar and navigate to Configuration | System Manager.
   3. Choose Server Roles and expand the entry of the server.
   4. Under Server Connection, choose Hosted Exchange server and then click on Save.

5. Add a server connection:
   1. Open Service Manager.
   2. Go to the menu bar and navigate to Configuration | System Manager.
   3. Choose Server connection (choose a new connection).
4. Options to be filled are shown in the following table:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server Role</td>
<td>Choose Hosted Exchange Server.</td>
</tr>
<tr>
<td>Server</td>
<td>Choose the Hosted Exchange MC server where the Services Manager Web Service is installed.</td>
</tr>
<tr>
<td>Credentials</td>
<td>Choose the IDs for the Hosted Exchange MC server.</td>
</tr>
<tr>
<td>URL Base</td>
<td>Use the /ExchangeWS/HostedExchange.asmx URL.</td>
</tr>
<tr>
<td>Protocol</td>
<td>The default value is http.</td>
</tr>
<tr>
<td>Port</td>
<td>The default value is 8095. If you change the port here, change it in the Services Manager Web Service as well.</td>
</tr>
<tr>
<td>Timeout</td>
<td>The default value is 200000 MS.</td>
</tr>
<tr>
<td>Version</td>
<td>Choose the Exchange version.</td>
</tr>
</tbody>
</table>

5. Upon completion, click on Save.

6. Update the required Service settings:
   1. Open Service Manager.
   2. Go to the menu bar and navigate to Configuration | System Manager.
   3. Choose Service Deployment and choose AD Location Services and Location Filter.
   4. Expand Hosted Exchange and choose the Service settings.
   5. Any setting that has a value of [ExchangeServer] needs to be changed to the Exchange server's name.
   6. Provide the sys domain name in Sys Domain, else you may end up with a provisioning service failure.
   7. Choose a mail database in Preferred Mail Services.
   8. Navigate to Public folder | Public folder enable.
   9. Then navigate to Public folder | Public folder server.
10. Offline Address book can be spread using Public folder.
7. Create a mailbox during user provision:

   1. Keeping ADSL chosen, expand Hosted Exchange and click on User Plans.
   2. Choose the Mail Databases checkbox, click on Reload, and then choose at least one mail database.
   3. Choose the Mailbox storage limit checkbox and provide the maximum amount of storage allocated to each provisioned user.
   4. Click on Apply and then on Save.

**Step 3 – provisioning the hosted Exchange service to consumers**

After the configuration of hosted Exchange services, our next primary objective is to provide the service to clients. In order to do so, please perform the following steps to provision the end users:

1. From the Services Manager menu bar, click on Customers and choose the customer for whom you want to provide services.
3. Click on the Exchange service name. The Grant access to "Hosted" Exchange applications screen appears.
4. On Customer Plan, choose the package you want to provide to the client.
5. On Exchange Domain, the domain needs are to be selected for the purpose of inbound e-mail routing.
6. Then, on the Exchange Domains pattern choose either Force customer wide primary address or Manage individual user primary e-mail addresses.
7. Ensure that the appropriate Exchange version is selected.
8. Resource restriction and resource configuration are possible under their respective tabs.
9. Billing can be enabled with suitable charges.
10. Click on Provision to enable the customer to provide Exchanges services to users.
Scenario 3 – Virtual Machine Service deployment

I hope that Scenario 2 has helped you understand using messaging and collaboration as a service via CPSM. Now let us explore VM as a service using CPSM:

The overall steps involved in VM as a service are as follows:

- **Step 1**: Deploying the VM web service on a server
- **Step 2**: Service Configuration using the VM service
- **Step 3**: Providing the VM service to clients

**Step 1 – deploying VM web service on a server**

Virtual machine as service via CPSM requires installation of CPSM components. In order to deploy the components, perform the following steps:

1. On the Choose Deployment Task screen, choose Add Services & Locations.
2. On the Add Services & Locations screen, choose Install Services.
3. Read and accept the license agreement and then click on Next.
4. On the Choose Web Services screen, choose Virtual Machine Web Service and then click on Next.
5. On the Ready to install screen, review your choice and then click on Install.
6. After installation, click on Finish.
7. From the Installed Services screen, click on Configure next to the Virtual Machine web service list item.
8. On the Summary screen, review the configuration info. If you want to change anything, go back to the suitable configuration screen. When the summary contains the settings we want, click on Next. The Configuration Tool configures the VM webs service and exhibits progress.
9. Click on Finish and then click on Exit to close the Configuration Tool.
Step 2 – Service Configuration using the VM service

As of now, we have installed the required VM service, and as the next step, let us start configuring each component required for the VM service.

1. Permit the service from Top and Location levels:
   
   For the Top level:
   
   1. Open Service Manager.
   2. Go to the menu bar and navigate to Configuration | System Manager.
   3. Choose Service Deployment.
   5. Choose Consumer Plan, create a customer plan, click on Create, and save it.

   For the Location level:
   
   1. Open Service Filter.
   2. Choose AD Location Services.
   3. Choose a value for Location Filter.
   4. Expand VM and save it.
   5. Verify whether the following settings have values as shown in the following table:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDP Console URL</td>
<td>VMconnection.aspx</td>
</tr>
<tr>
<td>Self Service Role</td>
<td>Self-service</td>
</tr>
<tr>
<td>VMPATH</td>
<td>If the consumer is in a clustered Hyper-V host, change the path from {PreferredDrive}Images{CustomerShortName} to {PreferredDrive}{CustomerShortName}</td>
</tr>
</tbody>
</table>
2. Examine IDs:
   1. Open Service Manager.
   2. Go to the menu bar and navigate to Configuration | System Manager.
   3. Choose IDs; in between, do ensure that the Admin account for Citrix Services is enabled.

   ![While adding IDs, we have to ensure that encryption is permitted.]

3. Enable the Exchange server:
   1. Open Service Manager.
   2. Go to the menu bar and navigate to Configuration | System Manager.
   3. Choose Servers.
   4. Verify whether Citrix Server is enabled and then choose Enable Server accordingly.

4. Allocate the server roles:
   1. Open Service Manager.
   2. Go to the menu bar and navigate to Configuration | System Manager.
   3. Choose Server Roles and then expand the entry of the server.
   4. Under Server Connection, choose the hosted Exchange server and then click on Save.

5. Add a server connection:
   1. Open Service Manager.
   2. Go to the menu bar and navigate to Configuration | System Manager.
   3. Choose Server connection (choose a new connection).
4. Options to be filled are shown in the following table:

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server Role</td>
<td>Choose Virtual Machine.</td>
</tr>
<tr>
<td>Server</td>
<td>Choose the VM server where the Services Manager Web Service is installed.</td>
</tr>
<tr>
<td>Credentials</td>
<td>Choose the IDs for the VM Server.</td>
</tr>
<tr>
<td>URL Base</td>
<td>Enter /VirtualMachine/VirtualMachine.asmx as the value.</td>
</tr>
<tr>
<td>Protocol</td>
<td>It defaults to http.</td>
</tr>
<tr>
<td>Port</td>
<td>It defaults to 8095. If you change the port here, change it in the Services Manager Web Service as well.</td>
</tr>
<tr>
<td>Timeout</td>
<td>It defaults to 200000 MS.</td>
</tr>
<tr>
<td>Version</td>
<td>Choose the Exchange version.</td>
</tr>
</tbody>
</table>

5. Upon completion, click on **Save**.

6. Test the connection when needed.

6. Synchronize resources needed:

1. Open **Service Manager**.
2. Go to the menu bar and navigate to **Configuration | System Manager**.
3. On **Environment**, choose **Location** and **SCVMM servers**.
4. Check the contents and import the existing Hyper-V.
5. Import the Hyper-V settings (if required).

7. Configure the virtual network:

We can create all four types of VLANs: Dedicated, Shared, Reserved, and Mandatory.

We can also assign multiple subnets to a VLAN and use the Service Manager for the default gateway configuration.

Perform the following steps to do so:

1. Open **Service Manager**.
2. Go to **VM** and navigate to **Configuration | Virtual network Manager**.
Step 3 – provisioning VM services to clients

After configuring VM services and primary objects of provision, the service configured to cloud consumers has to start. In order to do so, please perform the following steps:

1. On the CPSM menu bar, navigate to Customers | Customer Services.
2. Then on Customer Search, find the customer for whom you want to provide the Virtual Machine service.
3. In the Services list, click on Virtual Machine. The Service Plan Configuration screen appears.
4. On Customer Plan, we need to choose the plan that we want to assign to the customer.
5. In Management Server, choose the SCVMM server for handling customer requests generated through Services Manager.
6. Under Virtual Resources, perform the following actions:
   1. Expand the Hosts & Networks node, and choose the server you want to host the VMs and the network under each host.
   2. Expand the Machine Templates node, and choose the templates the customer administrator can use to create VMs.
   3. Expand the Guest OS Profiles node, and choose the OS the customer administrator can assign to the machine templates.
   4. Expand the DVD Images node, and choose the images the customer administrator can mount on virtual machines.
   5. Expand the CPU Types node, and choose the CPUs the customer administrator can use for virtual machines.
7. Under Networking, Expand the node for the type of VLAN you want to assign and choose the VLAN to assign as the customer's virtual environment.
8. Under Resource Configuration, customize the settings assigned by the package template we have selected earlier.
9. Click on Advanced Settings and perform the following actions:
   1. On Maximum Users, choose the Enable checkbox and enter the total number of users the customer can provide.
   2. On Billing, ensure the Enabled checkbox is selected so that the service generates charges to the cloud customers.
10. Click on Provision to enable the customer to create virtual machines.
Other services that can be deployed via CPSM and can be provided to cloud consumers or cloud resellers are as follows:

- CRM 2011
- DNS
- File Sharing
- Lync Enterprise and Lync Hosted
- Mail Archiving
- Microsoft SQL Server Hosting
- MySQL
- Office Communication Server 2007
- SharePoint 2010
- Windows Web Hosting


### Exporting and importing service packages

For exporting and importing service packages, you need to ensure the following requirements are met:

- Validate that the source and destination environments for the service package have the unique version of CPSM installed.
- Verify that a user is configured with the two schema administrator roles: **All Services Schema Administrator** and **Service Schema Administrator**. It is mandatory to create a custom service or import or export a service.
- Create the service (Configuration | System Manager | Service Deployment) or configure the property.
- Test and verify the service to be exported.
Please perform the following steps to export a service package:

1. Log on to the **CPSM** control panel.
2. From the **Services Manager** menu bar, navigate to **Configuration | System Manager | Service Schema**.
3. Expand the service to be exported.
4. Click on **Export** to save the file to a required store.
5. (Optional best practice:) Specify the creator, URL, and version for the service.
6. On the **Preview** area, review the items to be included in the export file and update as needed.
7. To add an assembly file (`.dll`) to the export package for a custom service, perform the following steps:
   1. In the **Add file** area, click on **Browse**, navigate to the `.dll` file, and click on **Open**.
   2. Choose the folder for the DLL file and then click on **Add**.
8. Click on **Export** and save the exported file.

Please perform the following steps to import a service package:

1. Log on to the **CPSM** control panel. This operation requires the user roles of **All Services Schema Administrator** and **Service Schema Administrator**.
2. From the **CPSM** menu bar, navigate to **Configuration | System Manager | Service Schema**.
3. On **Service Management**, click on **Import a service**.
4. Click on **Browse** to navigate to and select the service, and then click on **Open**.
5. To review the items included in the package file, click on **Preview** and update the selections as needed.
6. Click on **Import**. An **Import Complete** message gets displayed, followed by a list of the actions performed during the import.
7. Restart all provisioning servers across all locations.
8. We need to use the **CPSM** control panel to update customer and user plans and service settings as needed.
Summary
In this chapter, we learned about the overall steps involved in deploying services using CPSM and also went through the process of deploying services such as Citrix as a service, VM as a service, and Hosted Exchange as a service. Along with that, we also learned about importing and exporting services using the CPSM control panel. In the next chapter, we will learn about CPBM installation and configuration.
Managing CloudPortal™ Services Manager 11.0

With the knowledge gained in Chapter 3, Deploying CloudPortal™ Services Manager 11.0, you will have understood about services deployment. Now let us get into the CPSM functionality, followed by the CPSM's wizard-driven system to simplify operational tasks. It's a unique solution as a role-based system, characterized by flexibility and scalability. Let us start with creating and managing cloud consumers.

In this chapter we will learn about the following:

- Creating and managing cloud consumers and tenants
- Managing security roles and provisioning changes
- Managing reports

Creating and managing cloud consumers and tenants

Until now, you have learned a lot about services deployment using the CPSM deployment tool; now, we will have a look at how to create and manage cloud consumers and clients using CPSM.

Customer creation using CPSM involves the following:

- **Hosted services**: These are the deployed services
- **Customer’s users**: These are the consumer admin accounts
- **Consumers/users**: These are the cloud clients who have access to one or more provisioned services
- **Self-Service resellers**: These are the resellers who can create and manage their own accounts
An overview of customer creation

In this section, we will learn about the initial steps in the creation of a customer. In order to create a new user, we need to perform the following steps:

1. Create a new consumer by navigating to Customers | New Customer from the Citrix Portal Services Manager menu bar.
2. Create a customer Admin user to manage their users and perform operational services in the consumer’s organization.
3. Provision Service is available to consumers (an operation that can only be performed by a cloud service provider or a cloud reseller).
4. Create a consumer to provision the services later (an operation that can be performed by a cloud consumer admin user).
5. Provision services to consumers (an operation that can be performed by a cloud consumer admin user).

To create a consumer, a cloud service provider provisions a customer and their consumers with the Resellers option. The Resellers option, in turn, creates its own consumers and enables them to be resellers as well. Service providers should be able to access the advanced CPSM control panel for configuration functions.

Creating users

The following list enumerates the various entities via which cloud consumers can be created:

- Create new users using the New wizard
- Import many users using Bulk User Import
- Transfer consumers from one cloud tenant to another (client)

In order to create a user, we need to perform the following steps:

1. Click on Users and choose New User from the CloudPortal Services Manager menu bar.
2. The mandatory information to be provided is Name, Display Name, User Name, and Password.
3. After this, service provision will be instantly available to the consumers.
For configuring the account settings for the newly created user, perform the following steps:

1. Click on **Additional User Properties** to update the required information about the created user.

2. Under **Account Settings**, configure the following:
   - For **Change password at next logon**, choose **Yes** to require the user to set a password when first logging in. Choose **No** to disable the change password option.
   - For **Set passwords to never expire**, choose **Yes** to prevent user passwords from expiring. Choose **No** to permit the user password to expire at systematic intervals.
   - For **Account Disabled**, choose **Yes** or **No** to disable/enable the user account respectively.
   - For **Account Locked**, **No** is the only option, which is opted by default.
   - For **Account Expires**, choose **Never** to prevent account expiration. Choose **End of** to choose the date when the account expires.

3. Click on **Advanced Options** to choose security roles for the user. The **Configure a custom role collection** checkbox and all the security roles are chosen by default.

4. For **Configure a custom role collection**, choose and allocate one preconfigured role using the drop-down list.
   - (Optional) Use **Magnify Email Addresses** to configure one or more e-mail addresses for the user. Else, the CPSM automatically configures an e-mail address constructed from the UPN.

5. Upon completion, we can select **Provision** to create the user.

Before we start, we need to provision the service to the consumers using CPSM. Now let's go ahead and see how to create a new template by performing the following steps:

1. On the **CPSM** menu bar, click on **Users**.

2. On **Management**, click on **New Template User**. On clicking, we will be able to see the **Create User** wizard.

3. For **Display Name**, provide a username for the template, and choose **Additional Properties** to add address, organizational, and other information.
4. Click on **Account Settings** to configure the password change and expiration options.

5. Click on **Advanced Options** to choose a security role for the template user. To optimize the security role, choose **Configure a custom role collection** and commit it by clicking on **Save**. On doing that, the **Provision Services** wizard appears.

6. Choose the services that you want to provision when the template is used to create a new user and commit it by clicking on **Save**.

The process of importing bulk users or editing existing users in the current customer hierarchy can be performed by using **Bulk User Import** wizard. This tool is used in the Microsoft Excel 97-2003 format.

---

**Perform the following steps:**

1. Click on **Users** and choose the **Bulk User Import** option.

2. For **Upload User Import File**, choose **Browse**, steer to your new or edited workbook, and select it.

3. Update the description for the workbook and click on **Upload**.
4. On the file list, click on the upload date of the file you uploaded and under Import File Management, click on Import. The User Import screen appears.

5. Click on New Users or Existing Users to view the uploaded users. (Optional) Expand a user to view the account properties associated with it.

6. Click on Save to import the selected users.

The upcoming option is a flexible feature (Transfer (Move/Copy)) for CPSM, which helps to move a cloud consumer from one cloud tenant to another. Migrating the user info and provisioned services to the new cloud tenant will require the following settings:

- Both cloud tenants must belong to the same CPSM location (that is, AD Domain).
- Provisioned services that will be transferred with the cloud consumers are limited to Hosted Exchange and Office Communications Server (OCS). If the user is provisioned with any other service, we have to undergo a process of de-provisioning that service before attempting the migration.

We can also make a copy of an existing cloud consumer within the customer hierarchy. The copied user resides in the original cloud consumer (customer) hierarchy and possesses the original consumer-provisioned services.

For performing Move operations:

1. From the CPSM menu bar, choose Users and navigate to Configuration | User Move.
2. In Customer Search, type a customer name (cloud tenant) and click on Next.
3. In User Search, type a username (cloud consumer) and click on Next.
4. Accept or edit the defaults and click on Next.
5. Click on Finish to move the cloud consumer (user).

For performing Copy operations:

1. Choose Users to display all the cloud consumers (users) for a cloud tenant (customer), then click on a user to access the User Functions wizard.
2. Click on Copy User. The Create User screen pops up.
3. Provide the user info and password for the new consumer and configure the consumer account settings.
4. Click on Copy Services and uncheck the boxes for any provisioned services that are not required.
5. Click on **Provision**. The **Provision Services** screen displays all the provisioned and unprovisioned services.

6. Click on **Provision** for the service you want to provision to the user.

### Managing security roles and provisioning services

A **security role** is a set of rules for setting up permissions that describe the cloud tenant, admin, and cloud consumer accesses to precise tasks in the CPSM. For this case, the first or default user created for a cloud tenant is a cloud tenant consumer admin. The cloud tenant admin is robotically assigned the customer admin security role. The cloud tenant admin can then assign one or more security roles to cloud consumers in the customer hierarchy. A security role can also consist of multiple security roles.

CPSM provides a security service to manage cloud tenants (customers), cloud consumers (users), cloud service tasks, cloud user services, and cloud reporting.

The following table lists the features of security roles installed by default on deployment of the CPSM:

<table>
<thead>
<tr>
<th>Role</th>
<th>DNS Service Admin</th>
<th>My Exchange Service</th>
<th>Everyone</th>
<th>My Hosted Apps and Desktops Service</th>
<th>Exchange Service Admin</th>
<th>My Services Management</th>
<th>Exchange Users</th>
<th>MySQL Admin</th>
<th>File Sharing Service Admin</th>
<th>OCS Service Admin</th>
<th>OCS User</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD Sync Admin</td>
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<td>Advanced User View</td>
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<tr>
<td>All Schema Admin</td>
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<tr>
<td>API User</td>
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<tr>
<td>Authenticated Users</td>
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<td>Citrix Service Admin</td>
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<tr>
<td>Content Management Service Admin</td>
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<tr>
<td>CRM 2011 Admin</td>
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<tr>
<td>CRM 2011 User</td>
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<tr>
<td>Customer Admin</td>
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<tr>
<td>Partial User Admin</td>
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<tr>
<td>Reporting Users</td>
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</tr>
</tbody>
</table>

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[68]
To manage and maintain changes on demand, there needs to be a change in the billing and pricing. A workflow helps us to approve or reject the changes as well as helps cloud consumers to control their cloud. By default, a workflow is not enabled in CPSM.

In order to enable a workflow operation, we need to perform the following steps:

1. From the CPSM menu bar, choose **Configuration** and navigate to **System Manager | Workflow Setup**.
2. On the **Workflow Setup** screen, click on **Enable**. The **Workflow Setup** screen shows configuration choices for workflow approval.
3. In **Components**, choose the workflow approval chain forms to be enabled in the control panel. By default, **Manager Approval** and **Group Approval** are selected.
4. For **Email**, configure the following objects:
   - **Reply Email Address**: Address to be used for approval notifications
   - **Reply Email From**: Email customization
   - **Web URL**: External URL for the CPSM control panel
5. For **Maintenance**, in **Retention Days**, customize the number of days to keep the resolved approval requests in the database. By default, requests are kept for 30 days.
6. In order to enable self-service security roles for **Workflow Approval**, choose **Allows users to manage their own account and services**.
7. If required, choose **Reset to default role settings** to reapply the security role.

<table>
<thead>
<tr>
<th>Role</th>
<th>My Account and Services Management</th>
<th>SharePoint 2010 Admin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reseller Full Admin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reseller Partial Admin</td>
<td></td>
<td>SQL Service Admin</td>
</tr>
<tr>
<td>Service Admin</td>
<td>Template User and Service Admin</td>
<td>User and Service Admin</td>
</tr>
<tr>
<td>SQL Users</td>
<td>User Admin</td>
<td></td>
</tr>
</tbody>
</table>

[69]
Approval stage

There are the following three scenarios to look at here:

- **Manager approval chains**: These consist of consumers who are designated as managers. We can specify a user's manager using the Manager field on the User Details screen in the control panel. In this chain, activities are approved at successive levels in the consumers' organization.

- **Group approval chains**: These consist of consumers who elect to receive notifications for precise types of requests. In this chain, actions are approved by consumers who perform specific tasks within the cloud tenants' organization.

- **Workflow can be enabled with security**: While enabling workflow approval, we can also enable security roles that permit users to change their own account or provision services to themselves without additional approval.

Managing reports

CPSM includes the following billing formats:

- **Customer Detail**: Shows the billing details for services at the customer level
- **Distributor Summary**: Shows the usage data for reporting to the CSP distributor
- **Reseller Detail**: Shows the billing details for services at the reseller level

For generating reporting views, we need to ensure that the foundation for data transfer to the data warehouse is set. Please perform the following steps for generating a reporting view:

1. From the CPSM menu bar, click on Reports and navigate to Configuration | Data Warehouse.
2. On Refresh, click on Refresh report views from reporting services.
3. On Filter, select the service for which you want to generate views.
4. Under Generate, click on either of following:
   - **Views for all services**: Click on this option to generate views for all deployed services
   - **Views for selected service**: Click on this option to generate views for the service that we have selected in step 3
In order to create a new reporting view, we need to ensure that it can transfer data to the data warehouse. Please perform the following steps for setting up a new report view:

1. From the CPSM menu bar, click on Reports and navigate to Configuration | Data Warehouse.
2. On the Filter option, select the service for which you want to create a new view.
4. Under Reporting View Configuration, configure the following settings:
   1. In Description and Base View, enter a friendly name and select an existing template on which to base the new view.
   2. Under View Name, select the options you want for creating a unique view name.
5. Under Data Set, click on Keys or Filters to define the data included in the new view. Select Optimize for Large Datasets to improve the performance when a large number of records will be processed.
6. Under Properties, click on Properties and select to include properties from the selected base view or from the reporting object ID.
7. Under Property & Counter Aggregation, specify aggregate and non-aggregate properties and counters.
8. Click on Apply Changes to save your selections and click on Save.

Summary
In this chapter, we learned about how to create a cloud user from CPSM using a variety of methods, such as the new user wizard, Bulk Import, and Transfer (Move/Copy). We also learned about the various default security roles available on CPSM, how to provision a workflow, and then about how to manage reports. In the next chapter, we will see how to install and configure CPBM.
In Chapter 4, Managing CloudPortal™ Services Manager 11.0, you learned about managing CloudPortal Service Manager. Now, let us learn and explore the installation and configuration of CloudPortal Business Manager.

In this chapter, we will learn about the following topics:

- Installation of CPBM
- Configuration of CPBM
- Starting and stopping CPBM

**Installation of CPBM**

In this section, let us learn about the installation of CPBM. CPBM helps cloud service providers by offering the following features:

- It runs Anything-as-a-Service (XaaS) from a modifiable catalog of services capable of running IaaS, PaaS, SaaS, as well as third-party cloud services.
- It permits users to have self-service access to the cloud infrastructure and client account management tools.
- It makes cloud services management simpler by unifying and mechanizing the provision services, BSS/OSS systems, pricing, billing, metering, and consumer management under a single, flexible platform.
Now, let us get ready for CPBM installation and configuration. In order to get the sources for installation, visit https://www.citrix.com/downloads.html.

Upon downloading CPBM from Citrix, log in to CentOS with root credentials and extract the installation source package tarball using the following command in the required path of the server:

```
# tar -xvf CloudPortal-11.0-centos.tar.gz
```

Then go to the extracted folder on CentOS:

```
# tar -xvf CloudPortal-x.y.z-centos.tar.gz
```

In the next step, let us go ahead and install the MySQL database. MySQL can be installed on the same node where CPBM is to be deployed or it can be installed on a different node. CloudPortal Business Manager mainly uses the InnoDB storage engine.

You are already aware that CPBM 11.0 can be only installed on CentOS releases 5.6, 6.2, and 6.3, with a minimal requirement of Java JDK and JRE 1.6 and later, along with MySQL Server 5.1.X.

Perform the following steps to install the MySQL DB:

1. Read and accept the license agreement on the CPBM wizard.
2. Run the script `./install.sh` and choose option D to install the MySQL DB server as shown in the following screenshot:
3. When prompted, provide a username and password. We can use preferred values that are valid for MySQL DB.

[ DB password is obligatory. ]

4. Copy vast.cnf to yourfile.cnf using the following command:
   ```bash
cp -rf /usr/share/mysql/my-huge.cnf /etc/my.cnf
   ```

5. Modify the my.cnf file under /etc/ and insert the following lines of code under the ["mysqld"] fragment:
   ```
   default-time-zone='+00:00'
   max_connections=200
   ```

6. Restart the MySQL service using the following command:
   ```bash
   # service mysqld restart
   ```

Now MySQL DB is installed successfully on the selected CentOS node. Let us now go ahead and install the CPBM using the following steps:

1. Switch on the planned CPBM CentOS node and run the `install.sh` script from the downloaded package.
2. Select option I to start the installation on the CPBM node as shown in the following screenshot:
3. Upon selecting I, we will get the following pop-up on the CentOS screen:

![Image of pop-up]

4. After the successful installation of CPSM, we will get another pop up on the CentOS screen as shown in the following screenshot:

![Image of pop-up]

**Configuring CPBM**

Upon the selection of option G to configure CPBM, we need to perform the following steps:

1. The first step is to provide CPBM public server information:
   
   Public host name - *<OUR CloudPortal IP>*
   
   Public host port - 8080
   
   Public host protocol

2. Configure the CPBM startup with an encryption key. The encryption key length should be set to 16 characters. For security purposes, we need to provide an encryption key during the CPBM startup. The provided key will be used to encrypt the password field in the Cloud properties file.
In case you select the encryption key option, you must memorize the encryption key because we will need to enter it every time we start the CPBM. The CPBM startup choice can be disabled in the following manner:

```bash
[root@localhost CloudPortal-2.0.0-100-centos]# Chkconfig --list cloud-portal
Cloud-portal 0: off 1: off 2: off 3: off 4: off 5: off 6: off
```

In case we do not choose the encryption key, we will not need to enter the key when we start CPBM. The upcoming startups of CPBM options are enabled as specified in the following successive modes; so, when we reboot the system, the CPBM service will start naturally in the successive modes (3, 4, 5, and so on):

```bash
[root@localhost CloudPortal-2.0.0-100-centos]# Chkconfig --list cloud-portal
Cloud-portal 0: off 1: off 2: off 3: on 4: off 5: on 6: off
```

3. Provide CPBM DB with the upcoming configuration information:
   - Provide a host name, database username, and a database password.
   - Now provide a CPBM database encryption key. As you are already aware, the encryption key length should be 16 characters.

4. Select Yes (Y) or No (N) only if we need to configure LDAP (configuring LDAP is discussed later in this chapter).

5. In the next step of configuration, please provide the following e-mail configuration details of the sender (SMTP/SMTPS):
   - E-mail protocol (please ensure it is SMTP), e-mail host (server that hosts the exchange), mail port (to use for to and fro communication), e-mail username and password (one should be a privileged user to access, send, and receive e-mails)

6. Provide all the active currencies and choose only one default currency for our CPBM deployment from the active currency code loaded on our screen.

7. Provide the liquibase settings.

8. For security reasons, please provide a reCAPTCHA configuration. The following parameters are required to be configured:
   - A reCAPTCHA public key
   - A reCAPTCHA private key
   - A reCAPTCHA server
Enabling CAS authentication

In order to enable Single Sign on (SSO), Citrix CloudPortal supports the CAS authentication mechanism to access multiple password-protected systems after logging in the credentials. In order to make this work, the following configuration steps need to be followed:

1. Log in as the root user of CPBM, which is running the CentOS host.
2. Modify the cloud.properties file under /usr/share/vts3/repository/prop/ and lay down the following parameters; by default, native authentication is enabled:
   
   \[ \text{vmops.authentication.service=\text{cas}} \]

   In case new users are using the CPBM Configuration tool, it is not necessary to perform the preceding steps; the CPBM Configuration tool will take care of the parameters mentioned in the following table:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Login URL</td>
<td>\text{cas.login.url} mainly provides the public URL of the page where a user can log in to SSO.</td>
<td>\text{<a href="http://ourpacktpublichostname:8080/cas%7D">http://ourpacktpublichostname:8080/cas}</a></td>
</tr>
<tr>
<td>Logout URL</td>
<td>\text{cas.logout.url} mainly provides the public URL of the page where a user can log out of SSO.</td>
<td>\text{<a href="http://ourpacktpublichostname:8080/cas/logout%7D">http://ourpacktpublichostname:8080/cas/logout}</a></td>
</tr>
<tr>
<td>Service URL</td>
<td>\text{cas.service.url} mainly provides the public callback URL used by CAS to readdress reverts to Citrix CPBM.</td>
<td>\text{<a href="http://ourpacktpublichostname:8080/portal/j_spg_cas_sc_ck%7D">http://ourpacktpublichostname:8080/portal/j_spg_cas_sc_ck}</a></td>
</tr>
<tr>
<td>Validation URL</td>
<td>\text{cas.validator.url} mainly provides the private URL used in internal calls from Citrix CPBM to a CAS server to validate the CAS ticket.</td>
<td>\text{<a href="http://ourpacktprivatehostname:8080/cas%7D">http://ourpacktprivatehostname:8080/cas}</a></td>
</tr>
</tbody>
</table>
3. If any other application needs to be authenticated via CAS, some changes must be provided. Edit the deployerConfigContext.xml file as follows:

1. Unzip the cas.war file in the $VIRGO_HOME/pickup directory to a different location such as /tmp/cas/:
   
   ```
   $ mkdir -p /tmp/cas
   $ cp /usr/share/vts3/pickup/cas.war /tmp/cas/
   $ cd /tmp/cas
   $ jar -xvf cas.war
   ```

2. Open the deployerConfigContext.xml file found at /tmp/cas/WEB-INF/deployerConfigContext.xml:
   
   ```
   /tmp/cas $ vi WEB-INF/deployerConfigContext.xml
   ```

3. Add your new service in the deployerConfigContext file by searching for the serviceRegistryDao bean in the XML file and adding a new bean to its registeredServices property. The template is as follows:
   
   ```xml
   <bean class="org.jasig.cas.services.RegisteredServiceImpl">
   <property name="id" value="<Unique id/>"/>
   <property name="name" value="<Name of the application/>">
   <property name="description" value="<description of the application/>">
   <property name="serviceId" value="<Callback URL used by CAS to redirect back to the new application/>">
   </bean>
   ```

4. Recreate cas.war again using the jar utility as follows:
   
   ```
   /tmp/cas $ jar cvf cas.war *
   ```

4. To copy the cas.war file back to the pickup directory, execute the following command:
   
   ```
   /tmp/cas $ cp cas.war /usr/share/vts3/pickup/
   ```

5. To restart CPBM, execute the following command:
   
   ```
   # Service cloud-portal restart
   ```
Integration with CloudPlatform

On the Citrix CPBM server, execute the ./install.sh script and select **Integrate with Citrix CloudPlatform** from the menu. This will place the files required for SSO integration in CPBM:

![Screenshot of install.sh script]

After files are copied over for integration, we will not be able to access the CloudPlatform Management System using http://<hostname>:8080/client. Citrix recommends accessing the CPBM Management UI by first logging into CPBM and then clicking on **Launch Cloud Console** in the CPBM dashboard. As an alternative, the CloudPlatform Management UI can be accessed by using http://<hostname>:8080/client/?direct=true.

In order to set up a proxy, we need to add an AD alias with the same-origin security policy for web source code. Another mandatory need is that CPBM should be accessible with a fully-qualified domain name. To fulfill this, requests must go through a proxy server that provides a single point of failure for both CPBM Portal and CPBM systems. This can be fulfilled in different ways. The following steps demonstrate a technique using an Apache HTTP system running on CentOS 5.x and CentOS 6.x:

1. On the Apache server, install the following module that provides SSL and TLS sustainability:
   
   ```
   # yum install httpd mod_ssl
   ```
2. Create a file named \texttt{cloud.conf} under \texttt{/etc/httpd/conf.d/} and add proxying directives. To perform a single-node installation on the Apache system where the CloudPortal and CloudPlatform are installed, perform the following steps on the command line:

\begin{verbatim}
ProxyPreserveHost on
ProxyPass /portal http://CPIP:8080/portal
ProxyPass /cas http://CPIP:8080/cas
ProxyPassReverse /cas http://CPIP:8080/cas
ProxyPass /client http://CSIP:8080/client
ProxyPass /client/api http://CPIP:8080/portal/client/api
ProxyPass / http://CPIP:8080/portal
\end{verbatim}

3. To perform a three-node installation where Apache is installed, CloudPortal and CloudPlatform all run on separate nodes. In order to replace \texttt{CloudPortalNode} and \texttt{CloudPlatformNode} with the private hostname or IP on our own machines, execute the following commands:

\begin{verbatim}
ProxyPass /portal ajp://CloudPortalNode:20410/portal
ProxyPass /client ajp://CloudPlatformNode:20400/client
\end{verbatim}

\begin{itemize}
\item \texttt{CloudPortalNode} will show 8009 by default. Modify the \texttt{tomcat-server.xml} file under \texttt{/usr/share/vts3/config/} and change the value of the port from 8009 to 20410 in the following line:
\begin{verbatim}
<Connector port="8009" protocol="AJP/1.3"
    redirectPort="8443"
    URIEncoding="UTF-8"/>
\end{verbatim}
\end{itemize}

4. To perform a five-node installation where Apache is on one node, CloudPlatform on two other nodes, and CloudPortal on two additional nodes, use directives such as the following. In order to replace \texttt{CloudPortalNode} and \texttt{CloudPlatformNode}, place the following with the private hostnames or IPs of your own machine:

\begin{verbatim}
<Location /client>
Header add Set-Cookie "rte=.%{BALANCER_WORKER_ROUTE}e; path=/client; HttpOnly"
env=BALANCER_ROUTE_CHANGED
</Location>
<Location /portal>
Header add Set-Cookie "rte=.%{BALANCER_WORKER_ROUTE}e; path=/portal; HttpOnly"
\end{verbatim}
Installing CloudPortal™ Business Manager 2.0

env=BALANCER_ROUTE_CHANGED
</Location>
<Proxy balancer://portalcluster>
BalancerMember ajp://CloudPortalNode1:20410 route=ps1
BalancerMember ajp://CloudPortalNode2:20410 route=ps2
</Proxy>
ProxyPass /portal balancer://portalcluster/portal stickysession=rte
<Proxy balancer://cscluster>
BalancerMember ajp://CloudPlatformNode1:20400 route=cs1
BalancerMember ajp://CloudPlatformNode2:20400 route=cs2
</Proxy>
ProxyPass /client balancer://cscluster/client stickysession=rte

5. To configure CAS authentication, use the following code:

   <Location /cas>
   Header add Set-Cookie "rte=.%{BALANCER_WORKER_ROUTE}e; path=/cas; HttpOnly"
   env=BALANCER_ROUTE_CHANGED
   </Location>
   ProxyPass /cas ajp://CloudPortalNode:20410/cas

6. Insert the following line to avoid Cross-site request forgery (CSRF) related errors:

   ProxyPreserveHost on

7. If we modify the configuration later, such as to add more nodes, we can use the following command to reload the configuration:

   # apachectl graceful or # service httpd restart

To configure AD LDAP for CPSM, perform the following steps:

1. Log in to the CPBM as the root user.
2. Click on ROOT USER at the top-right corner of the CPSM UI.
3. Choose Administration from the dropdown.
4. On the Configuration dashboard, glance through the tab and select BSS/OSS Integration from the shown categories.
5. Select Directory Server and then click on Configure.
6. In the window that appears, click on Edit.
7. Enable the Field service by setting it to true.
8. Update the field directory mode based on the following:
   - To enable the LDAP push model, enable the Field Directory mode to push and then go to step 9.
   - To enable the LDAP pull model, enable the Field Directory mode to pull. Update all the fields in the Edit window.

9. Click on **Save and Close**.

After configuring of the CPSM portal, let us learn how to log in to the CPSM portal. By now, we should be able to access CloudPortal from the web browser.

Open a compatible browser and navigate to `http://<Hostname>:8080/portal/`. Use the following credentials to log in:

- **Username**: root
- **Password**: Portal123#

### Starting and stopping CPBM

CPSM maintenance options, such as start, stop, or restart, are in-built. To perform any operation, we need to log in to CPSM as the root user for the system, where CloudPortal Business Manager is installed and running, and issue the respective commands to perform their own operations.

The following table lists the various commands:

<table>
<thead>
<tr>
<th>Operations</th>
<th>Command to perform operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting CPBM</td>
<td><code># Service cloud-portal start</code></td>
</tr>
<tr>
<td>Stopping CPBM</td>
<td><code># Service cloud-portal stop</code></td>
</tr>
<tr>
<td>Restarting CPBM</td>
<td><code># Service cloud-portal restart</code></td>
</tr>
</tbody>
</table>

### Summary

In this chapter, we’ve learned about the overall steps involved in installing and configuring CPBM as well as operational steps such as starting and stopping the CPBM services. In the next chapter, we will learn about managing CPBM.
Managing CloudPortal™ Business Manager 2.0

In Chapter 5, Installing CloudPortal™ Business Manager 2.0, you gained knowledge of installing and configuring CPBM. Now let us learn about and explore managing various functionalities of CPBM.

In this chapter we will learn about the following:

- Managing profiles
- Managing products
- Managing workflows
- Managing accounts
- Managing billing

Managing profiles

A profile is nothing but a set of permissions saved under a unique name, such as Cloud "Administrator" or "Manager". Each and every user of our portal is allocated a profile. The profile is allocated to a user as soon as the user is added to the CPBM.

Profiles are useful for saving the most commonly used sets of permissions, so that they can be easily allocated to a user in a single operational step. This is much easier and less error-prone than setting up each user. Profiles ensure that a collection of users with equivalent duties and needs are all given same permissions.

Citrix CPBM ships with a predefined set of profiles. We cannot add or delete a profile. If we need a Create/Manage Profile permission, we can choose which permissions to permit under each profile name.
The following table lists various profiles built into CPBM by Citrix:

<table>
<thead>
<tr>
<th>Customer profile (predefined)</th>
<th>Service provider profile (predefined)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root</td>
<td>Master User</td>
</tr>
<tr>
<td>Ops Admin, Finance Admin</td>
<td>Billing Admin</td>
</tr>
<tr>
<td>Sales Support, Help Desk</td>
<td>User</td>
</tr>
<tr>
<td>Product Manager</td>
<td>Power User</td>
</tr>
</tbody>
</table>

Perform the following steps for profile creation using CPBM:

1. Click on Root user on the top-right corner of the CPBM UI.
2. Choose Administration from the drop-down list.
3. Move to the Profiles dashboard and choose the Service Provider or Customer tab based on the profile that needs to be created.
4. We can see the default list of profiles on the left-hand side pane.
5. Select the checkboxes under Allow for the roles that you would like to set for the profile and click on Save.

Users who have already been assigned the profile will find that their permissions have changed.

Citrix CloudPortal Business Manager comes with a predefined set of profiles, and those profiles are built-in without the Modify option.


Roles are certain common functions that are created with an objective to accomplish certain tasks. The following table lists the various roles in CPBM:

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Account create</td>
<td>This role has the capacity to create, read, update, and delete any customer account.</td>
</tr>
<tr>
<td>Account manage</td>
<td>This role has the capacity to view and update information on any customer account.</td>
</tr>
<tr>
<td>User create manage</td>
<td>This role has the capacity to create, read, update, and delete a user belonging to any customer account.</td>
</tr>
</tbody>
</table>
### Role and Description

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finance create manage</td>
<td>This role has the capacity to create, read, update, and delete financial information of any customer account (Account), for example, making payments or issuing credit. It depends on the Account create or Account manage roles.</td>
</tr>
<tr>
<td>Cloud manage</td>
<td>This role has the capacity to create, read, update, and delete resources via the Cloud Console.</td>
</tr>
<tr>
<td>Ops Comm</td>
<td>This role has the capacity to create, read, update, and delete updates that are published through the Cloud Health page.</td>
</tr>
<tr>
<td>Profile create manage</td>
<td>This role has the capacity to create, read, update, and delete profiles on the CloudPortal.</td>
</tr>
<tr>
<td>Config manage</td>
<td>This role has the capacity to view and update global configuration properties.</td>
</tr>
<tr>
<td>Product create manage</td>
<td>This role has the capacity to create, read, update, and delete any product.</td>
</tr>
<tr>
<td>Support Ticket manage</td>
<td>This role has the capacity to manage support tickets. Salesforce should be enabled.</td>
</tr>
<tr>
<td>Reports Admin view/download/e-mail</td>
<td>This role has the capacity to view/generate reports.</td>
</tr>
</tbody>
</table>

### Managing products

A **product** is any component that can be measured with an associated price; it requires one or more brokerage rules. Brokerage rules should match the accurate usage from the service to product. Product definitions are set by the service providers based on the norms they would like to use to segregate the pricing. Service providers must set a product price according to services or offerings.

Operations that can be performed while managing a product using CPBM are as follows:

- Adding a product
- Editing a product
- Retiring a product
- Adding a product to replace an existing one
Adding a product

We can create a new product to target new resources or to replace a retired product. If it is a fresh product, it has to be created first.

Perform the following steps:

1. Log in to CPBM as the root user or ops admin.
2. Click on the Catalog tab and select Plan from the dropdown.
3. Click on the Add New button from the Products dashboard to add a product.
4. The Add Product wizard appears. Provide the details (Name, Code, Display Name, and Unit of Measurement).
5. Click on Next.
6. Select the usage types that will impact this product. Provide the conversion factor and choose the appropriate aggregation handler/operator (combine or exclude) for each and every usage type.
7. Click on the + sign to enter the next usage type. After providing the details, click on Next.
8. Enter the mediation rules for the usage type. The mediation rules will be applied on how usage needs are to be collected. Click on Next.
9. Enter the utility or product charges for the active currencies in the channel. Click on Next.
10. Review all the details that we provided and then click on Add.
11. Click on Finish.

Editing a product

To perform an edit of a product, perform the following steps:

1. Log in to CPBM as the root user or ops admin.
2. Click on the Catalog tab and select Plan from the dropdown.
3. We can view the products on the left-hand side pane. Select the product that needs to be modified.
4. We can view the details of the selected product on the right-hand side pane. Place your cursor over the gear wheel icon and click on Edit.
5. Verify the product details in every section in the Edit Product wizard. Update the details wherever applicable.
6. Click on Save after you have made all the changes.
Retiring a product

We can either retire a product directly or can replace it with a new product. If we only want to retire the product, it will remain active in CPBM and charge the users based on the usage in the active subscriptions. If we want to retire an existing product and replace it with a new product, we have to ensure that we replace the existing product with the new product(s) as an entitlement in all the bundles. This replaced product will not be charged from the next plan of a channel catalog after it gets synced with the reference catalog, when this catalog appears in the future revision of the channel catalog.

Perform the following steps to retire a product:

1. Log in to CPBM as the root user or ops admin.
2. Click on the Catalog tab and select Plan from the dropdown.
3. We can view the products on the left-hand side pane. Select the product that you wish to retire.
4. We can see the details of the selected product on the right-hand side pane. Place your cursor over the gear wheel icon and click on Retire.
5. Select No if you wish to retire (or remove) the product in the Retire Product window. The product will not appear in the future reference catalogs.

Adding a product to replace an existing one

To add a new product in order to replace an existing one, the following steps need to be performed:

1. Log in to CPBM as the root user or ops admin.
2. Click on the Catalog tab and select Plan from the dropdown.
3. Click on the Add New button in the Products dashboard to add a product.
4. The Add Product wizard appears. Enter the required details (Name, Code, Display Name, and Unit of Measurement) to define the product.
5. Check the This product is replacing one or more products checkbox.
6. This product will appear in the current reference catalog. The product will appear in the channel catalogs once they are synced with the reference catalog.
7. Click on **Next** and select the usage types that will impact this product. Enter the adaptation factor and choose the appropriate aggregation handling (combine or exclude) for every usage type. Click on the + sign to enter the next usage type. After entering the details for the next usage type, click on **Next** and enter the mediation rules for the usage type. The mediation rule will be applied on how usage needs to be collected. Then click on **Next**.

8. Enter the utility or product charges for the active currencies in the channel. Click on **Next**.

9. Review the details you entered. Click on **Add** if they are correct.

10. Finally, click on **Finish**.

### Managing workflows

In CPBM (user action), a **business transaction** is a store where users can achieve a desired business goal; it has information about the planned change. A business transaction is started and activated from the point where a workflow can be inserted. A **workflow** is a multistaged approval and dashboard system. An **activity** is the tiniest part of work in a workflow. A **phase** is a logical set of activities, which need to be performed concurrently. Each workflow consists of one or more phases, and each phase has one or more activities. Each phase consists of activities that can be either manual or automated. The different states of an activity are given as follows:

- **New**: Activity is yet to begin
- **In-Progress**: Activity is running
- **Waiting**: User input is required
- **Success**: Activity has been successfully completed
- **Failure**: Activity was declined or rejected
- **Error**: There has been some unexpected behavior or exception that needs to be fixed

Every phase holds a set of activities that should be finished effectively. All phases should be finished to complete a business transaction; the following are the occurrences in which a task is shaped:

- **InternalApprovalActivity**: This activity creates a task for the users with a role mentioned in the property to approve or decline the business transaction
- **CollectPaymentInfoActivity**: This activity creates a task for a user having the ROLE_ACCOUNT_BILLING_ADMIN role probing for credit card info
- **TenantOwnerApprovalActivity**: This activity creates a task for users having the ROLE_ACCOUNT_ADMIN role to approve or decline the business transaction
In CPBM, the following types of business transactions initiate a workflow:

- Tenant activation
- Account type conversion
- Subscription activation
- Payment information change

Different states of a workflow are given as follows and it are defined based on the status of activities:

- **New**: This indicates that the workflow is yet to be started
- **Running**: This indicates that there are pending activities in this workflow
- **Completed**: This indicates that the workflow was successful
- **Error**: This indicates that the workflow failed or is partially complete with an error message

In tenant activation, there are three default types of workflow: trial account activation, retail account activation, and corporate account activation.

Default activities for this workflow are listed as follows:

- **For trial account activation**: Verify the master user's e-mail
- **For retail account activation**: Verify the master user's e-mail and collect credit card info
- **For corporate account activation**: Receive approval from finance admin

In CPBM, there are various account type conversion workflows available, which are listed as follows:

- Any conversion to retail
- Any conversion to corporate
- Trial to corporate
- Retail to corporate

In order to enable subscription workflow on CPBM, perform the following steps:

1. In the CPBM main menu, click on **Accounts**.
2. Click on **All Accounts**.
3. Select an account from the left-hand side pane. We will be able to see the information of the account on the right-hand side pane.
4. Click on the gear wheel icon on the right-hand side pane.
5. Select the View Billing History option from the dropdown.
6. The Usage and Billing dashboard appears. Click on Subscription.
7. The Workflow option is visible next to the Status field.

In order to view workflow status on CPBM, perform the following steps to enable the master user to view all tenant scope workflows:

1. In the CPBM main menu, click on Accounts.
2. Click on All Accounts.
3. Select an Account on the left-hand side pane. We will able to see the information of the account on the right-hand side pane.
4. Click on History tab on the right-hand side pane. We can view the workflows for this account.
5. Click on View under Workflow. We can see the status of the selected workflow in the Workflow Status window.

Managing accounts

In CPBM, Account Type reflects the payment deal that has been agreed upon by both parties on cloud usage. To add to this, the signup process varies in part depending on the account type.

To add to it, the system account should be a service provider and it can be customized during installation. CPBM offers three account types. They are listed as follows:

- Retail account: This account type is periodically billed to a credit card on file.
- Corporate account: These accounts are assigned to corporates with established credit. This account type requires additional processing and hence additional time to activate.
- Trial account: This is a trial account type.

In order to access the Account Types page, perform the following steps:

1. In CPBM, log in as the root user.
3. Select an account type to view and edit its properties.
Managing billing

CPBM helps to track the resources utilized by cloud customers, calculate the amounts owned, handle invoicing, and manage payments for cloud customers automatically.

In billing, we will see the invoice types, payments, retail postpaid accounts, subscription handling, view payment activity, refunds, chargeback, and so on.

The following are the classified invoice types in CPBM:

- **Subscription invoice**: This is an invoice that will get produced any time a new subscription is created.
- **Close-out invoice**: This is an invoice that will get generated every day for each and every user; it contains a utilization report for the day. A master user or a user with billing admin role will be able to see all the close-out invoices for all the users in their own account(s).
- **Renewal invoice**: This is an invoice that will get produced whenever the renewal is outstanding for a subscription.
- **Debit note**: This is an invoice that will get produced only when there is imbursement setback or cancellation.

The following are the classified invoice states in CPBM:

- **Posted**: This shows that the invoice has been produced and sent to the account and the invoice will be exhibited in the account report.
- **Provisional**: This shows that the invoice has been produced for a user but it will be exhibited in the account statement based on the subscription grade.

The following are the classified invoice types in CPBM, and the imbursement is collected through an authorized payment doorway:

- **Auto-payment**: This payment is collected either through an authorized payment gateway, such as authorize.net or credit card details provided by the cloud customer.
- **Manual payment**: This payment is made manually by the cloud consumer with a card.
- **Record payment**: This payment is made through checks. These payments are recorded and parallel invoices are marked as paid by the cloud service provider.
• **Notional payment**: This payment can be made any time. To do so, the account should be active and we need to ensure that account statements are updated.

• **Issue credit**: Pay as you go with an available credit limit.

## Retail postpaid accounts

The upcoming categories of items are charged to the customer's credit card at the end of every billing cycle.

• **Full subscription**: This is all about the renewal fee for the upcoming billing period.

• **Resource usage**: This is all about the present billing period over and above the amount included in the customer's subscription plan.

• **Any annual**: This is all about fee renewals where the anniversary date of the original subscription fell within the present billing period.

• **Prorated periodic**: This is all about the fees for subscriptions that were started in the middle of the present billing period.

• Other options are **One-time setup** fee and **Annual fee**.

## CPBM subscription handling

The following steps give an overview of how billing is handled for product bundle subscriptions in retail postpaid accounts:

1. The root user logs in to CPBM and clicks on **Catalog**.
2. The root user chooses a product bundle and goes through the **Subscription** wizard.
3. If the subscription has a monthly fee, it is prorated for the present month.
4. CPBM begins tracking the customer's usage of the entitlements in the subscription. Any usage discussed previously involves an amount, which in turn results in additional charges being added to the customer's total for the present billing period.
5. An invoice is produced on the renewal date and the credit card on the file is billed for the total amount used.
6. These steps are repeated to add more subscriptions and collect payments for each and every client.
7. At any time, the customer or a representative at the service provider can cancel one of the cloud customer's subscriptions.
The master users and billing admin users of a cloud customer account can see the account's payment activity. Perform the following steps to view the payment activity:

1. Click on **Accounts**, navigate to **Usage & Billing**, and then navigate to **Payment Activity**.
2. Things we can do in this wizard are as follows:
   
   ° View the list of invoices and payments.
   
   ° Issue a chargeback to refund money to the customer's credit card. Select a payment in the list and click on **Issue Charge Back**.

The master user and billing admin user of a cloud customer account can modify their payment systems. If we have the Finance Create/Manage permission, we can modify a customer's payment details. Credit card details can be set as follows.

1. Click on **Accounts** and then navigate to **Usage & Billing**.
2. Navigate to **Payment Info** and then click on **Edit**.
3. Provide the required information and then click on **Save**.

Refunding options on CPBM are quite possible; if we have the Finance Create/Manage permission, we can make a refund and find ways of giving money back to customers via credits and chargebacks.

A **credit** adds funds to the customer's balance in CPBM. Any future charges incurred by the customer will be paid for first out of this credit balance. To do so, perform the following steps:

1. Click on **Accounts**.
2. Select **All Accounts**.
3. Select the appropriate customer. The customer's details appear, including the current positive balance (credit).
4. Click on **Issue Credit**.

A **chargeback** returns funds through the customer's credit card at the request of the bank that issued the card. The chargeback is processed through the same payment gateway that is used for routine invoice payments. To use chargeback for getting the money refunded, perform the following steps:

1. Click on **Accounts**.
2. Click on **Usage & Billing**.
3. Click on **Payment Activity**.
4. Select the disputed payment and click on **Issue Charge Back**.
Summary
In this chapter, we learned about managing CPBM profiles, CPBM products, CPBM workflows, CPBM accounts, CPBM billings, and their fundamental essentials. In the next chapter we will get to know about operating CPBM 2.0.
Operating CloudPortal™ Business Manager 2.0

In Chapter 6, Managing CloudPortal™ Business Manager 2.0, you will have learned about of managing the CPBM essentials. Now let us learn about and explore the various operations of CPBM.

In this chapter we will learn about the following:

- Job scheduling
- Notifications and health
- CRM and reports

Job scheduling

On the cloud arena, running of jobs essentially needs to be automated. Jobs are system-generated tasks that have to be run in a given time period to accomplish certain actions such as billing. Now let's look at various CPBM jobs provided by Citrix Systems.

- Daily_Billing_Job
- Trial_Expiry
- Consistency_Checker_Job
- Cloud_Service_Event_Processing
- Workflow_Job
- Subscription_Validation_Job
To configure jobs on CPBM, perform the following steps:

1. Log in to CPBM as the root user or Ops Admin.
2. Select the configuration.
3. Choose Portal.
4. Then choose Jobs.

The difference between the previous versions of CPBM and CPBM 2.0 is the billing subprocess. In CPBM 2.0, all the billing processing is done by DailyBillingJob. This job is, by default, scheduled to run at 1 A.M. server time. The following are the two subprocesses scheduled in the main job:

- Scanning through all the service instances and fetching their usage data for the previous day. This data is converted into useful information which CPBM can understand and maintains.
- Scanning through all the tenants, picking up the information from the previous sub process, and using it to update/post account statements and make payments.

Both of these sub processes are transactional; as in, if any of the service instances should fail during the reporting of daily usage, it is skipped and the next service instance is requested for its usage data.

CPBM uses numerous batch jobs to perform its regular routine processes, such as tracking practice and generating invoices. Jobs are planned to be run at a specified time and recur at a set interval. In CPBM, batch jobs are deployed using JavaBeans and delivered using the Spring platform. In order to view the grade of the batch jobs that are currently running, or have been run in the past, we can use the CPBM UI. The batch jobs are present in two XML files in the CPBM installation path:

- **XML Format 1**: applicationContext-jobs.xml
- **XML Format 2**: applicationContext-scheduler.xml

Batch jobs are planned using cron-like time expression syntax in XML.

To configure a batch on CPBM, perform the following steps:

1. Navigate to \usr\share\cloud\portal\webapps\admin\WEB-INF\lib\ and copy the vmops.admin-1.0-SNAPSHOT.jar file to the \tmp directory.
2. Unzip the JAR file, vmops.admin-1.0-SNAPSHOT.jar, and copy it over to applicationContext-jobs.xml and applicationContext-scheduler.xml.
3. Modify the `applicationContext-jobs.xml` file under `cloud-portal\vmops.admin\src\main\resources\META-INF\spring\`, and modify the XML elements for each and every job that we want to work with.


5. Edit the `applicationContext-scheduler.xml` file under `cloud-portal\vmops.admin\src\main\resources\META-INF\spring\` and ensure that every trigger ID distinct in `applicationContext-jobs.xml` is listed in the `triggers` property of the `org.springframework.scheduling.quartz.SchedulerFactoryBean` bean element. If we need more help, we can have a look into the Job Scheduling Syntax in `applicationContext-scheduler.xml`.

6. Copy these files to `\usr\share\cloud\portal\webapps\admin\WEB-INF\classes\`.

After editing the files, the CPBM server needs to be restarted for the changes to take place.

Notifications and health

CPBM provides a monitoring technique with a variety of notifications for both the regular routine events and the known services alerts that require monitoring in place.

The CPBM notifications are visible in the CPBM portal; alerts are triggered as per the e-mail addresses provided in the CPBM portal. Since this is a "getting started" book, explaining each and every notification is beyond the scope of this book.

The CPBM notification sources come in the following two different formats:

- CPBM events and alerts for creation of a new account
- Citrix CloudStack events and alerts are triggered

In order to configure the notification, perform the following steps:

1. Log in to CPBM with administrative privileges.
2. Choose **Root User** on the CPBM UI.
3. Choose **Administration** from the pop-up list.
4. Scroll using `< or >` in the tab and choose **Server**.
5. Click on **Notifications** and navigate to **Configure**.
6. And now an **Edit** window pops up. Click on **Edit**.
7. Update the required **Notification to** field and click on **Save**.

Now let's explore a little about service health. **Service health** is all about exploring the status of our portal that can be outlined in a total rating termed as health. Health status is fixed manually. It is visible to cloud customer users; service health is a quick way to personalize a notification.

In order to view a notification, perform the following steps:

1. Log in to CPBM with administrative privileges.
2. Choose **Root User**. Click on the **Support** tab and navigate to **Status**.
3. Our **Service Health** screen is shown.
4. Click on **Add Status** to add a status.
5. (Optional) We can also add a scheduled maintenance.
6. Click on **Service Health** and navigate to the **Maintenance** tab.

---

**CRM and reports**

CPBM provides CRM features to aid in the management of cloud consumer associations. We can adopt the identity of any cloud consumer and they can have a look at the same CPBM UI, but it needs to be conditioned to the CRM system's master operator. It will be useful to track the cloud customer's utilization in real time to compare the prices accumulated till date with the budget perimeters set by the cloud customer. CPBM CRM has the ability to, in effect, log in as the cloud customer, which is very beneficial for performing actions on the cloud customer's behalf.

CPBM is unified with [http://www.salesforce.com](http://www.salesforce.com) for the very purpose of ticket-logging for support requests (CRM trouble and service tickets) by cloud customers. We can have a look at the created, existing tickets and we can also submit tickets, which are later stockpiled in Salesforce CRM.

In order to create a trouble ticket, we need either an Account Create / Account Manage permission, along with a Trouble Ticket Manage permission; we can raise a trouble ticket on behalf of a cloud customer user. In order to do so, we need to perform the following steps:

1. Log in to CPBM with the cloud user privilege.
2. Click on **Accounts**.
3. On the **Tickets** area of the CPBM dashboard, click on **Submit Ticket**.

---

[100]
4. Click on Add New Ticket.
5. Provide values for Subject and Description.
6. Click on Submit.

Now let’s look at how we can view a ticket. We require the Account Manage permission for CPBM and need to perform the following steps:

1. Log in to CPBM with a cloud user privilege.
2. Click on Accounts.
3. On the drop-down list, select the name of the cloud customer we want to work with.
4. The following objects to need be configured on the wizard:
   1. A VM for cloud customers.
   2. Choose Usage & Billing to view the resources expended by a cloud customer during the billing period.
   3. Choose Resources to manage a cloud customer’s infrastructure.
   4. Choose Submit Ticket to create a trouble ticket for a cloud customer.
   5. Choose View All Tickets to see all the concerns filed by a cloud customer.
   6. Choose Users to add, deactivate, change, and remove cloud customer’s users and more operations associated with users.
   7. Choose Alerts to set a maximum budget for a cloud customer to view or create alerts.
   8. Click on Notifications to see the notifications from CPBM and Citrix Cloud Platform that are visible to the selected cloud customer.

Finally, let’s look at how to close a created ticket. To do so, we require a cloud customer user who produced a ticket, the cloud Master User of the account under whom the ticket was created, or any cloud user with the Trouble Ticket Manage permission, to close a created ticket. We have the following two options:

1. Using the CPBM menu bar:
   1. Click on Support.
   2. Then click on the Tickets tab.

2. Alternatively, via the CPBM cloud customer’s dashboard:
   1. Click on Accounts.
   2. In the Tickets screen of the dashboard, click on View All Tickets.
Once we are in the Tickets screen, perform the following steps:

1. Choose the ticket that you want to work with. Information about that ticket appears below in the CPBM screen.
2. Choose the ticket and close it.

With this, we have learned about working with a ticket. Now let us explore CPBM reporting. Reports supply a graphical summary of a cloud service. A report can be exported in a diversity of formats, including PNG, JPEG, PDF, or SVG vectors. To view our reports, we need to navigate to the Reports tab in the CPBM main menu. The following table illustrates the different types of reports in CPBM:

<table>
<thead>
<tr>
<th>Report</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Registrations</td>
<td>Helps to create a new report</td>
</tr>
<tr>
<td>Top Customers</td>
<td>Helps to create a report for a top customer for a specific month and year</td>
</tr>
<tr>
<td>Product Usage</td>
<td>Helps to create a report to view product usage for a specific month and year</td>
</tr>
<tr>
<td>Bundle Usage</td>
<td>Helps to create a report to view monthly usage by product bundle for a particular month and year</td>
</tr>
<tr>
<td>Custom Reports</td>
<td>Helps to create a custom report by choosing on the popped up list and selecting Generate</td>
</tr>
</tbody>
</table>

**Custom reports**

The first installation of CPBM provides a set of prebuilt reports. With the aid of CPBM Professional Services, we can also insert custom reports to meet our precise reporting requests. Custom reports are fully generated as unplanned reports via CPBM where we can accept effort parameters. In order to configure the report settings, perform the following steps:

1. Log in to CPBM as a root user.
2. Choose Root user on the CPBM UI.
3. Choose Administration from the popped up list.
4. Scroll using < or > and choose Reports.
Export option configuration:

1. Click on Exports and navigate to Configure.
2. In the Edit window, click on Edit.
3. Provide a value for registrations.reportpath.
4. Click on Save.

Mediation option configuration:

1. Click on Mediation and navigate to Configure.
2. In the Edit window, click on Edit.
3. Provide the value for aggregation.category.
4. Click on Save.

Notifications option configuration:

1. Click on Notifications and navigate to Configure.
2. In the Edit window, click on Edit.
3. Provide the value for reports.email.
4. Click on Save.

Summary

In this chapter, we learned about operating the Citrix CPBM with scheduling jobs, batch management, setting notifications, operating health checks, and system support—CRM reporting. With the knowledge gained in this book, you should now be confident enough to work on CPBM and CPSM. Thanks for reading this book.
CPBM is developed based on the Java OSGi framework model for pluggable components. Service connectors are developed by DIY. DIY is a Citrix ISV partner and CCP is the abbreviation of Connector Citrix Portal. The objective of CCP is to act like a bridge between service terminals and CPBM, and provide any service as a catalog of instances. CCP is an independent product from CPBM; lifecycles can be managed separately. In order to deploy and use CCP, all developers should be aware of high-level essentials, which are as follows:

- CloudService on-boarding and merchandizing
- CloudService provisioning
- CloudService UX
- CloudService usage and billing

A Cloud Service Connector will provide the following information:

- Metadata
- SPI implementation
- Resource Files
CCP Connections

The following are the key terms used in CCP:

- **Instances**: Virtual Machines are called instances on the Citrix Cloud Portal
- **Volumes**: Storage allocated to physical and virtual machines
- **Snapshot**: A representation of a virtual machine configuration when the snapshot is taken
- **IP Address**: The unique ID assigned for your service provider
- **Network Name**: The network name, zone, and VLAN
- **Security Group**: The default security group offered by your service provider
- **Adding a user**: Creating a user and managing permissions
- **Modifying a user**: User create/manage permissions
- **Editing our company setup**: Changing the company address
- **Edit user profile**: Editing your personal profile and storing details
- **View API IDs**: Custom API that can be viewed under API credentials
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