Hosting Environments in SharePoint 2010 Products

Overview of hosting features and concepts

Multitenancy

Multitenancy refers to the ability to partition data of otherwise shared services or software in order to accommodate multiple tenants. This is in contrast to setting up separate hardware or even running multiple instances of a service. In Microsoft products and technologies, multitenancy of services creates a true hosting environment wherein server farm resources are maximized. Many of the multitenant features are deployed and managed using Windows PowerShell.

Before learning about hosting environments, it is important to understand the services architecture. The following models are prerequisite to this model:

- Services in SharePoint 2010 Products
- Cross-Farm Services in SharePoint 2010 Products

Site subscriptions

Multitenancy is tied to site subscriptions. *A site subscription is a logical group of site collections that can share settings, features, and service data. Site collections for each tenant are brought together with a subscription ID.* The subscription ID is used to map features, services, and sites to tenants and also to partition service data according to tenant. The Subscription Settings service keeps track of multitenant services and subscription IDs.
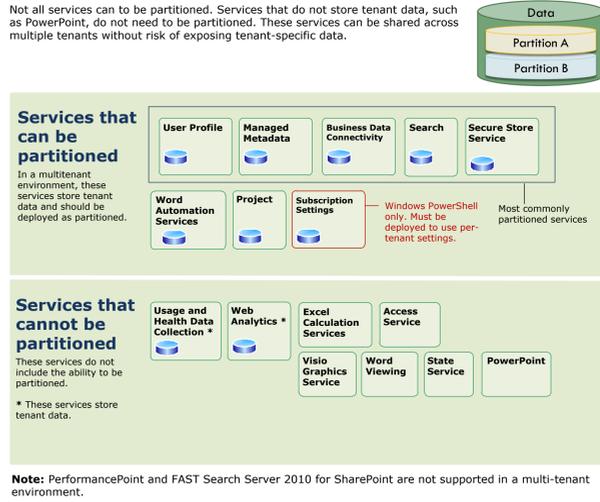
Here's how it works:

- Farm administrators deploy services to the farm, including the Subscription Settings service. Service applications can either be deployed as partitioned (data is isolated for each tenant) or unpartitioned (data is shared across all tenants). Some services do not store tenant data and can be shared across all tenants without being partitioned.
- Farm administrators deploy a Tenant Administration site for each tenant (using Windows PowerShell). The Tenant Administration site is associated with a subscription ID. Administrators deploy additional site collections for each tenant that is tied to the subscription ID.
- All service applications that are connected at the Web application level are available for site collections within the Web application. Administrators choose which services to offer and activate for each tenant. The subscription ID for a tenant is used to map services to the site collections.
- Tenant administrators manage their own site collections using their assigned Tenant Administration site.
- Site collections for multiple site subscriptions can be hosted in a single Web application.
- Multiple site subscriptions can share a content database, or a site subscription can include content across multiple content databases.
- All site collections for a single site subscription must reside on the same farm, but can be spread across Web applications.

Service partitioning

Services can be configured to share data across all tenants or to partition data for each tenant (that is, data isolation). Each service can be set up differently. Services can be created in partitioned mode by using Windows PowerShell or unpartitioned mode by using Windows PowerShell or Central Administration. They cannot be changed later. To achieve partitioning, both the service and the service connection must be deployed in partitioned mode. The service connection is called a proxy in Windows PowerShell.

Not all services can to be partitioned. Services that do not store tenant data, such as PowerPoint, do not need to be partitioned. These services can be shared across multiple tenants without risk of exposing tenant-specific data.

Services that can be partitioned

In a multitenant environment, these services store tenant data and should be deployed as partitioned.

User Profile | Managed Metadata | Business Data Connectivity | Search | Secure Store Service
Word Automation Services | Project | Subscription Settings

Windows PowerShell only. Must be deployed to use per-tenant settings.

Most commonly partitioned services

Services that cannot be partitioned

These services do not include the ability to be partitioned.

Usage and Health Data Collection * | Web Analytics * | Excel Calculation Services | Access Service
Visio Graphics Service | Word Viewing | State Service | PowerPoint

* These services store tenant data.

Note: PerformancePoint and FAST Search Server 2010 for SharePoint are not supported in a multi-tenant environment.
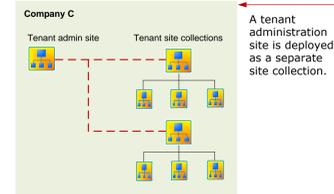
Hosting and tenant administration

Farm administrators can host multiple tenants on the same farm and centrally manage the deployment of services and features. Tenant administrators can manage the configuration of administrator-delegated features and control the functionality of their sites.

SharePoint Server 2010 aligns administrative functionality with common hosting roles, as summarized in the following table.

Role	Description
Hosting company (Farm administrator)	- Manages the farm-level settings and hardware. - Controls database configurations. - Installs all new approved features and solutions. - Can brand the Tenant Administration pages.
Hosted company administrator (Tenant administrator)	- Purchases space, features, and bandwidth from hosting company. - Controls the architecture of customer sites but not the content. - Configure per-tenant settings. - Reviews usage statistics.
Hosted company (Site administrator)	- Owns site collections. - Configure site settings that are exposed by features and services. - Reviews usage statistics.

Tenant administration is provided through a site template titled "Tenant Administration," which is associated with a subscription ID. This site template is hidden and the site can be created and given to tenant administrators only by a farm administrator. The following figure shows the Tenant Administration home page.

Tenant administrators can manage all site collections for their subscription from one place.

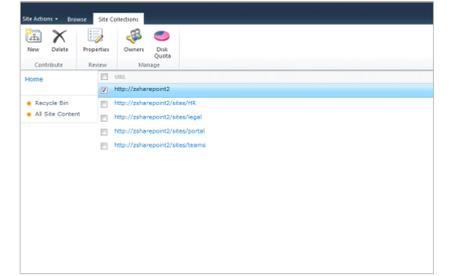A tenant administration site is deployed as a separate site collection.

Deploying feature sets

Feature sets are groups of features that are enabled by farm administrators for tenants to activate and use. The site collection (SPSite) and subsite (SPWeb) features that are exposed to tenants through the tenant administration site depends on which feature set is enabled for the tenant administrator by the farm administrator. The following list describes how feature sets work in a hosting environment:

- Feature sets are applied by using Windows PowerShell.
- Feature sets that correspond to the available licensing options will be available, allowing you to host multiple licensing standards on the same farm.
- You can create custom feature sets.
- By default, site templates that depend on features that are not activated for a tenant are not exposed. For example, the Enterprise Search Center template is not available to tenants that do not have the enterprise search feature. However, if site templates are manually deployed for tenants using Windows PowerShell, the templates will not work without the dependent features.
- Site templates filter non-dependent features. For example, if My Sites are not activated for a tenant, the site templates used by the tenant will not show the My Site link.
- If third-party features are added to a farm, the use of these features with feature sets should be tested to ensure that these do not add additional feature activation dependencies that are not honored within the feature set.

Enterprise hosting environments

In an enterprise environment, some data is shared across the organization while other data can be partitioned. This example provides a practical implementation in which each team or department can manage their own metadata while sharing all other services.

Mapping of Web applications to services

In this example, all services are offered through the default group.

There are two instances of the Managed Metadata service:

- Centrally managed instance— All data is shared and centrally managed.
- Partitioned instance — Data is partitioned based on site subscriptions for individual departments or teams.

This approach allows autonomy for individual departments to manage and consume their own data while at the same time providing a central store for organization-wide terms, keywords, content types, and other data.

The data for all other services is shared across the organization (the services are unpartitioned).

In this example, services are hosted on the same farm as the content. Optionally, the services can be hosted on a dedicated services farm or on different farms. Cross-farm and single-farm services are delineated.
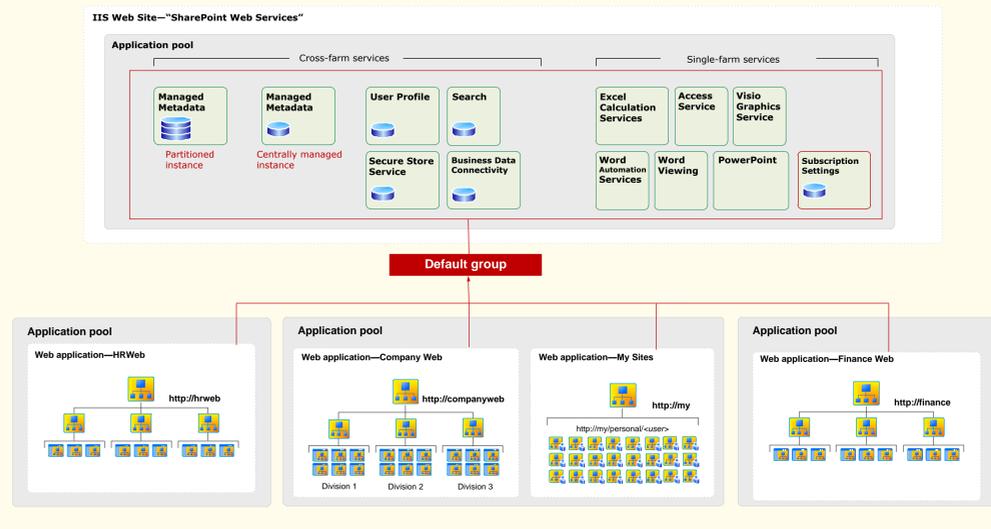
### Mapping of site collections to the partitioned service

While the service connection is configured at the Web application level, subscription IDs map services for specific site collections.

This illustrations shows how site collections are mapped to the partitioned instance of the Managed Metadata service. The dotted lines represent different subscription IDs.

- HRWeb — A single subscription for all sites beneath the root site collection.
- CompanyWeb — A different site subscription for each division site collection. No site subscription for the top-level site collection.
- MySites — Not mapped to the partitioned instance.
- FinanceWeb — A single site subscription.

Subsites that are created in the Tenant Administration site are included in the tenant subscription.
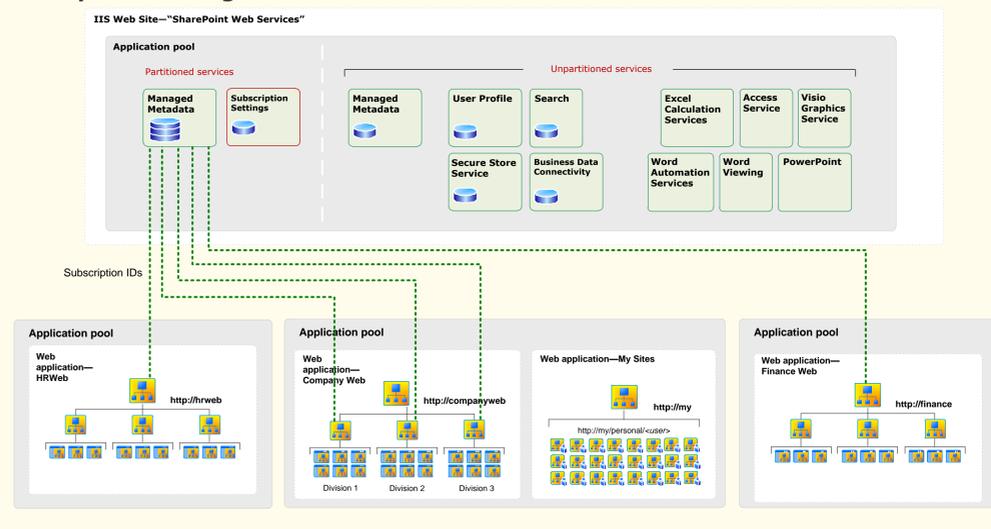
Shared hosting environments

In a multi-company hosting environment in which tenant data and administration are isolated, the configuration of partitioned and shared services is key. This example provides a practical implementation of partitioned services and also provides recommendations on deploying customer sites.

### Mapping of Web applications to services

In this example:

- All services are offered through the default group.
- All services that can be partitioned are deployed in partitioned mode. This ensures that usage and diagnostic information reports tenant data correctly.

Deploying customer site collections

This example provides the following ways in which customer sites can be deployed to a farm:

- Dedicated application pool and Web application
- Shared application pool and dedicated Web application
- Shared Web application
  - Authenticated sites
  - Unauthenticated sites
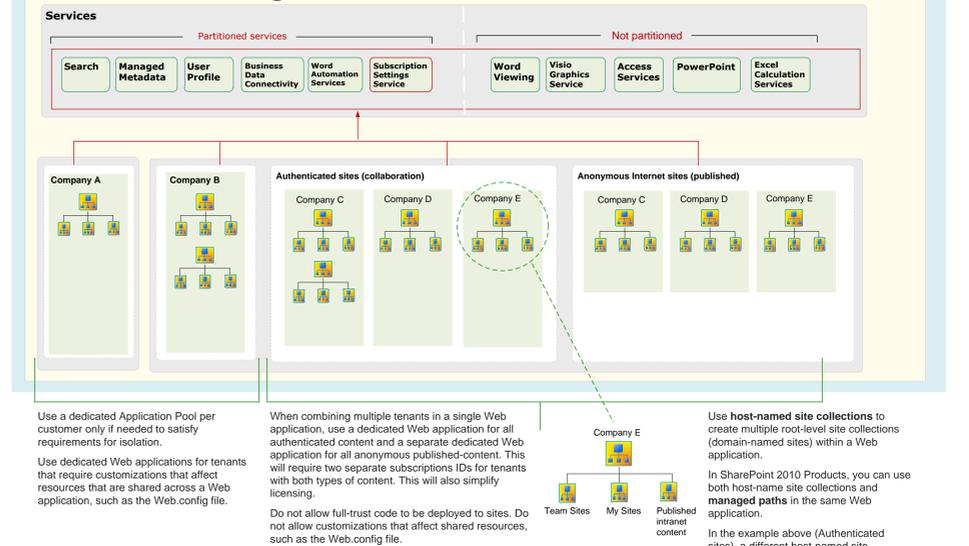
Use a dedicated Application Pool per customer only if needed to satisfy requirements for isolation.

Use dedicated Web applications for tenants that require customizations that affect resources that are shared across a Web application, such as the Web.config file.

When combining multiple tenants in a single Web application, use a dedicated Web application for all authenticated content and a separate dedicated Web application for all anonymous published-content. This will require two separate subscriptions IDs for tenants with both types of content. This will also simplify licensing.

Do not allow full-trust code to be deployed to sites. Do not allow customizations that affect shared resources, such as the Web.config file.

Use **host-named site collections** to create multiple root-level site collections (domain-named sites) within a Web application.

In SharePoint 2010 Products, you can use both host-name site collections and **managed paths** in the same Web application.

In the example above (Authenticated sites), a different host-named site collection is used for each company. Company C includes two different host-named site collections. Beneath each top-level host-named site collection, a managed path is used to create a second tier of top-level site collections for sites such as team sites, my sites, published intranet content, or separate divisional sites (example left).

Scaling out a multitenant environment

You can optimize resources by scaling out with specialized farms. Consider deploying multiple farms to:

- Divide administrative responsibilities.
- Implement different service level agreements for services versus content.

Scale out a hosted environment in the following ways:

- **Services farm** — The first scale-out action for a hosting environment is to create a dedicated services farm for all services that can be shared across farms.
- **Search farm** — Search is a resource-intensive service that may warrant a dedicated farm (in addition to a farm to host all other services).
- **Tenant content farms** — Tenant content farms can be scaled out in a similar way as the services farm. When a single farm approaches capacity, deploy an additional farm and connect it to the cross-farm services farm(s).
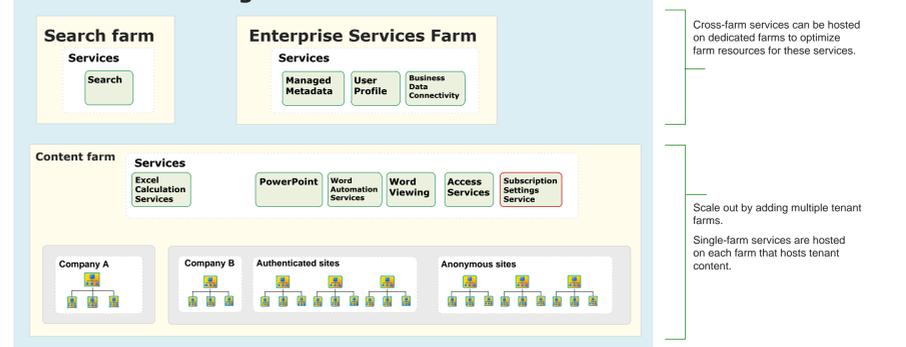
Cross-farm services can be hosted on dedicated farms to optimize farm resources for these services.

Scale out by adding multiple tenant farms.

Single-farm services are hosted on each farm that hosts tenant content.