# How It Works

<http://blog.cloudfoundry.com/2011/12/15/cloud-foundry-welcomes-net-framework-community-contributions/>

Unlike other frameworks supported by Cloud Foundry, .NET requires a Windows based Cloud Foundry “Execution Agents” (DEA) running an IIS web server. An important part of the newly available open source code is support for Windows-based DEAs. Note that this implementation requires customers to bring their own Windows licenses for each Windows-based DEA. Cloud Foundry itself continues to run on Linux and does not require Windows licenses, but manages the Windows-based DEAs as it does with any other DEA.

.NET developers can access any application service or data store within the Cloud Foundry system, and support for Windows-based DEAs also opens the door for Windows-based applications services such as Microsoft’s SQL Server database. The end result is enterprise customers will have a common model for deploying and scaling both Java and .NET applications, as well as the newer frameworks supported by Cloud Foundry.  
  
The contributors are also working on Visual Studio add-ons and MMC snap-ins that allow .NET developers and Windows administrators to harness Cloud Foundry using the tools they already know.

# AppCloud Architecture

<http://uhurusoftware.com/products/appcloud-architecture>

The Uhuru AppCloud consists of controllers which determine which servers to host applications on and the actual servers which run the applications. The controller software runs on Ubuntu Linux. The app hosting servers can be either Ubuntu Linux or Windows Server systems, depending on the types of applications that need to be supported. Windows Servers are required for hosting .NET applications and Ubuntu Linux servers are required for hosting Open Source applications like Java, PHP and Ruby. The RTG AppCloud has both Windows and Linux servers.

An AppCloud agent is installed on each of the servers or virtual machines which allows them to participate as app hosting servers managed by the AppCloud controllers.

Only a handful of controllers are required to manage many hundreds of hosting servers. The controllers determine which specific hosting servers to run applications on based on how busy they are and the capacity needs. The controllers also monitor the health of the app servers and will automatically handle redirect traffic to healthy systems if a node goes down as well as distribute work evenly across servers for load balancing.

The Uhuru AppCloud software is agnostic as to which management tools or virtualization technology is used to provision and manage the environment. For example, AppCloud will run just as well on Amazon virtual machines as on virtual machines using Microsoft’s Hypervisor or VMWare’s ESX.

**Uhuru AppCloud – taking Cloud Foundry™ to the max**

<http://uhurusoftware.com/products/cfcore/>

We provide all the great capabilities available through VMware, Inc.’s Cloud Foundry technology as well many enhancements to provide even more flexibility and simplicity. The Uhuru AppCloud gives developers the choice to pick any framework, language or data service they wish without ever having to worry about managing servers or virtual machines again.

In addition to the standard Cloud Foundry Core runtimes like Java, Ruby and Node.js, the Uhuru AppCloud offers:

* Extensive support for .NET and Microsoft SQL Server
* Extensive support for PHP
* Extension for the Visual Studio IDE
* Extensive graphical management tool that can be installed on your PC
* Rock solid, secure, tunnels to data and file services that work with management tools of your choice
* A simple web console to manage your apps in the cloud

## Bringing the best of Open Source and .NET together

* With the Uhuru AppCloud proprietary technologies like .NET and Microsoft SQL are no longer silos apart from the world of Open Source. Your .NET applications can easily take advantage of MongoDB, MySQL or RabbitMQ just as your Ruby, PHP, Java and Node.js apps can use Microsoft SQL Server.

## Fast deployment of pre-packaged apps

* Our app directory of pre-packaged apps like WordPress, Umbraco, Sugar CRM and Magento can be deployed in as little as a minute with the click of a button. [Write us if you would like your apps included in the directory](mailto:uhuru@uhurusoftware.com).

## Coming soon to a service provider near you

* We are working with hosting companies around the world, helping them bring up Uhuru powered clouds of their own.

# Uhuru Delivers Uhuru .NET Services for Cloud Foundry

<http://uhurusoftware.com/uhuru-delivers-uhuru-net-services-for-cloud-foundry/>

Now, by taking advantage of Uhuru .NET Services for Cloud Foundry, Windows .NET developers can focus on building great applications rather than worry about how to deploy their software on specific cloud services, or how to scale their applications to handle large work-loads.

“Cloud Foundry has changed the way developers and IT Managers think about developing and deploying software for hosting in the cloud. It virtually eliminates the customization and deployment work they needed to do.  Uhuru .NET Services for Cloud Foundry brings this same simplicity to .NET applications,” said Jawad Khaki, co-founder and CEO of Uhuru. “With .NET Services for Cloud Foundry, .NET developers can use the tools they are already familiar with, like Visual Studio and Microsoft Management Console (MMC) snap-ins, and still quickly deploy software they write to whichever cloud service they wish to use.”

No more cloud service lock-in for .NET applications

By using Uhuru .NET Services for Cloud Foundry together with Cloud Foundry Windows, .NET developers also gain application portability. Developers will be able to easily move their software from one cloud service to another with no modifications. Uhuru .NET Services for Cloud Foundry doesn’t lock users in to one vendor. User are free to select the most appropriate cloud service from among the many competing providers. Private and public clouds are also both supported with Uhuru .NET Services for Cloud Foundry.

With Uhuru’s product, organizations can quickly move their applications to increase capacity across multiple cloud service providers. They can even switch to entirely new hosting services without any disruption or inconvenience. The product is built to provide maximum flexibility and agility for Windows organizations.

The product integrates with Windows and provides support for Visual Studio, MMC, SQL Server-all the systems that developers and administrators use as part of their daily work.

## Uhuru.NET Services for Cloud Foundry:

* Can be installed on the virtual machines of any cloud service provider.
* Can be installed on private clouds.
* Integrates seamlessly with the tools Windows .NET developers already use.
* Doesn’t require developers to customize their code for specific Cloud Computing services.
* Deploys .NET applications to the cloud with just a few mouse clicks.

# Uhuru AppCloud – Ready To Go

<http://uhurusoftware10.uhurucloud.com/products/uhuru-appcloud-ready-to-go/>

## Never touch the OS again!

Just focus on writing great software. The Uhuru AppCloud is designed to automatically deploy applications on web servers without any special configuration. The days of setting up servers, or configuring them to run new versions of the software you make are over.

* Deploy your apps with the click of a few buttons to as many different servers as you wish.
* Automatic fail-over ensures maximum reliability. Users won’t even notice when one server goes down.
* Automatic load balancing allows your applications to handle the heaviest traffic loads.
* Extensions for existing integrated development environments (IDEs) like Visual Studio and Eclipse make it easy to deploy your apps to the cloud and manage them.
* Define teams of engineers who can collaborate on applications.

## Any App

The freedom to develop the apps you want, the way you want you want and host them wherever you choose.

The Uhuru AppCloud won’t tie you down. We support every major web application language and platform there is. We have no proprietary APIs or architectures your apps need to support.

* We support .NET, Ruby, Java, Node.js and PHP. Use whichever language and platform you prefer.
* Setup the Uhuru AppCloud on your own private datacenter if you need the increased security of total control over your servers.
* Run existing web applications with no modifications. There is no need to spend time changing your applications to run in the cloud.
* Just upload your applications to one of Uhuru’s growing list of Service Provider partners and you won’t have to bother worrying about managing servers ever again. The Uhuru AppCloud can run on any network.
* Keep your options open. Move your application between different clouds at the click of a few button. Never let yourself get tied down to a single hosting service.

## The best of Windows and Open Source

Why choose when you can have it all?

The contest between Open Source and Windows is over. They both won! The Uhuru AppCloud supports .NET as well as all popular Open Source languages and frameworks . Better still, it is a snap to share data services between Windows and Open Source applications. Your .NET applications can access Open Source data services like MySQL, MongoDB and RabbitMQ. Open Source applications can access Microsoft SQL Server.

* Run your .NET web applications on Windows Servers in the Uhuru AppCloud. Our management agents for Windows are written in native Windows code.
* Microsoft SQL Server is a full-fledged service.
* Use our database management tunnel to use whichever database management tools you are familiar with including phpMyAdmin and Microsoft SQL Server Management Studio.
* Support for all popular Open Source languages including Java, Scala, Ruby, Node, Erlang, PHP, C#.
* Support for all popular Open Source frameworks including Spring, Grails, Express, Rails, Lift, MochiWeb, .NET.
* Support for publishing Open Source data services such as MongoDB, MySQL and RabbitMQ for use by all applications in the Uhuru AppCloud.

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| --- | --- | --- | --- |
|  | AppCloud – Enterprise Edition **In beta** | AppCloud – Service Provider Edition **In beta** | AppCloud – Ready To Go **In beta** |
| Automatic load balancing | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Automatic fail over | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Multi-language: Java, Scala, Ruby, Node, Erlang, PHP, C# | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Multi-framework: Spring, Grails, Express, Rails, Lift, MochiWeb, .NET | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Multiple services: MySQL, Postgres, MongoDB, Redis, RabbitMQ, Microsoft SQL Server, File Service | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Web apps run unmodified | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Auto-wiring of apps for data services | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| App deployment in minutes | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| No configuration of OS required | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Team collaboration for managing and publishing apps | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Command line interface | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Web management console | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Extensions for Visual Studio | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Windows Management Client | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Repository of pre-packaged apps for immediate deployment (e.g. Wordpress, Magento, SugarCRM) | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Runs on private networks | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
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| .NET apps can access Open Source services | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Open Source apps can access .NET | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Apps hosted on time-tested native OSes (Linux for Open Source, Windows for .NET) | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Easy registration and authentication with popular IDs (Gmail, Facebook, Yahoo, or Live IDs) | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Live for immediate hosting of apps | - | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Licensing for selling accounts | - | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png |
| Licensing for use by single organization | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | - | - |
| Billing integration | - | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | - |
| Hypervisor agnostic | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | http://uhurusoftware.com/wp-content/themes/Karma/truethemes_framework/extended/pricing-tables/images/checkbox.png | - |

# Iron Cloud

These components include the .NET fork of the Cloud Foundry code base, an updated Droplet Execution Agent (DEA) that can leverage Microsoft’s IIS web servers, and a Cloud Foundry Explorer tool that can be used by itself or as an add-in to Visual Studio.  Developers using Iron Foundry can take advantage of some of the same application services that Cloud Foundry supports such as MongoDB, Redis and MySQL, as well as a new application service for Microsoft SQL Server.

In the .NET ecosystem, NET and SQL go together like bread and butter. We felt that Iron Foundry could not happen without having SQL server support.   I believe as Cloud Foundry grows, its Database as a Service offering will have to support SQL server in order to support .NET.

The first challenge of getting a.NET application to work in Cloud Foundry environment was enabling Windows Server and making sure that all the operations were ported over from a Linux environment. The second, and probably the biggest, was the tool set as .NET developers had limited resources for deploying and configuring Cloud Foundry. We solved that by adding a Windows version of Cloud Foundry Explorer and a Visual Studio add in for Cloud Foundry.

While there were some minor changes, the beauty of Cloud Foundry is that it is a very extensible system that allows for other services and applications to be added with little to no issues. The biggest challenge again was enabling the interaction of Windows and IIS as stated above.

Iron Foundry forked the Cloud Foundry code and made addition to the cloud controller and NATS so that a .NET web app can be recognized.  We have built a Ruby on Windows version of the DEA so that we can orchestrate on IIS.  We will be subsequently replacing the Ruby+Windows with a C# port.  Given that it is a fork, one can run up a Ruby on Rails app without any issues as we are officially supporting .NET.  We ported VMC to a .NET version which is in beta as we have all the "important" items ported but not 100% coverage.

#### What is Iron Foundry?

Iron Foundry is an open source project that extends Cloud Foundry™ to the .NET ecosystem by providing services, installers, and developer tools.

[↑ back to top](http://ironfoundry.org/faq#0)

#### What is Iron Foundry's relationship with Cloud Foundry?

Iron Foundry is a fork of Cloud Foundry with .NET support. The Iron Foundry team is working with the Cloud Foundry community to enable .NET with changes in the core code base and developer tools. While we are collaborating closely with the Cloud Foundry team to ensure that Iron Foundry stays in synch with the core Cloud Foundry offering, as of today we are a stand-alone fork while Pivotal Initiative decides its direction for .NET support in Cloud Foundry.

[↑ back to top](http://ironfoundry.org/faq#0)

#### How can I use Iron Foundry?

Developers can run their own instances of Iron Foundry in-house or with any service provider who supports it, finally giving them a truly open, interoperable .NET PaaS solution that can be run inside and outside the firewall. Because you can run your own instances of Iron Foundry, it’s easy to leverage it for a full dev, test/ QA, and staging environment before pushing to production. Operations teams now have the freedom to choose among a variety of service providers providing the same PaaS used in their development environments, enabling them to pick the one that meets their specific needs in areas such as security, compliance, availability, location, etc.

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#### What does Iron Foundry Include?

There are multiple projects that make up the Iron Foundry offering:

**Cloud Foundry Core Integration**: A fork of the Cloud Foundry (VCAP) code base that modifies the code to support the ASP.NET framework. This code will be submitted back to the main project long term.

**Cloud Foundry Explorer for Windows**: This is the Windows -based cloud foundry explorer which we’ve open sourced today. It will held in the Iron Foundry repository.

**Cloud Foundry Visual Studio Add-in**: The Windows-based Cloud Foundry visual studio add-in that is open sourced and held in the Iron Foundry repository.

**Cloud Foundry Windows DEA**: .NET DEA for enabling and managing application on windows with IIS inside the cloud foundry environment.

**Cloud Foundry Windows VMC**: The future replacement for the Ruby VMC on Windows to enable a more supportable environment for developers on Windows. This code is live on Iron Foundry and we encourage beta testers to use it.

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#### Why is Tier 3 making Iron Foundry available as open source software?

At Tier 3, we’ve been big supporters of Cloud Foundry—the Pivotal Initiative-led, open-source PaaS framework—from the beginning. That said, we’re a .NET shop and many of our customers’ most critical applications are .NET-based. So today we’ve decided to contribute Iron Foundry, our own .NET fork of Cloud Foundry, back to the community as an open-source project. (This project includes both the primary framework as well as both a Windows version of Cloud Foundry Explorer and a Visual Studio Plugin for Cloud Foundry.)

[↑ back to top](http://ironfoundry.org/faq#0)

#### How can I start using Iron Foundry?

You have two choices for leveraging Iron Foundry immediately. First, you can take advantage of the “try it now” test bed environment available here on IronFoundry.org consisting of web and database instances per developer. The test bed is powered by Tier 3’s enterprise-class cloud platform and requires only email address, password, and acceptance of the Tier 3 PaaS EULA.

You can also run Iron Foundry in your own environment – simply download the code from GitHub under the Apache 2 license.

[↑ back to top](http://ironfoundry.org/faq#0)

#### How can I start contributing to the Iron Foundry open source project?

Just like with Cloud Foundry, contributors are encouraged to follow the best practice of forking the code on GitHub, work on improvements and then submit a pull request. Tier 3 will lead as project maintainers; pull requests can be submitted to the project maintainers to review and evaluate the proposed changes.

[↑ back to top](http://ironfoundry.org/faq#0)

#### Where can I learn more about Cloud Foundry?

You can learn more about Cloud Foundry by going to www.cloudfoundry.org. There you will see FAQ, Forums, and a awesome community dedicated to helping each other out.

[↑ back to top](http://ironfoundry.org/faq#0)

#### Does this project compete with .NET PaaS providers already in the market?

Iron Foundry is an open source project and not a service provider. We believe companies already offering a .NET PaaS solution in the end will work to integrate Iron Foundry into their system and enhance their offering for the developer community.