



COMCAST - 2007 RED HAT INNOVATION AWARD WINNER

FAST FACTS

Category	Emerging and Leading Edge Technologies
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OVERVIEW

Selected for their use of Red Hat Enterprise Linux 5 virtualisation capabilities to create a cost-effective, highly efficient testing and certification environment to support the corporate IPv6 initiative.

PLEASE DESCRIBE YOUR COMPANY. (NUMBER OF EMPLOYEES, PRIVATE/PUBLIC, INDUSTRY, ETC.)

A public company with 87,000 employees, Comcast Corporation is the nation's leading provider of cable, entertainment, and communications products and services. The company primarily develops, manages, and operates broadband cable networks and delivers programming content. Comcast currently serves 24.1 million cable subscribers, 11 million high-speed Internet users, and 2.1 million voice customers throughout the US.

PLEASE DESCRIBE THE BUSINESS AND/OR TECHNICAL CHALLENGES YOU FACED IN THIS PROJECT.

As Comcast continues to expand existing offerings, add new services, and grow its subscriber base at rapid rates, the company faces an increased demand for IP address space. To accommodate this demand, Comcast has decided to adopt IPv6. IPv6 provides a nearly infinite IP address space it, however, IPv4 and IPv6 are fundamentally different protocols. In order to ensure that the adoption of IPv6 is seamless Comcast's Back Office Architecture group within the Systems Engineering organisation needed to create cost effective and

flexible laboratory environments to support the wide range of activities related to the adoption of IPv6. Being able to easily and reliably support the development and testing of essential applications and systems is paramount. Furthermore, virtualised environments can further be leveraged to facilitate cost effective simulation of various events and activities related to the adoption of IPv6. The creation of the Back Office Architecture laboratory environment had to be cost-effective while providing the flexibility and scalability required in an ever-changing test and proof of concept environment.

WHAT WAS THE DESIRED SOLUTION?

Comcast's Systems Engineering Back Office Architecture team required a solution that could be used to satisfy a wide range of requirements related to the adoption of IPv6 particularly those related to systems and the underlying infrastructure. The goal was to create a live environment where internal developers, as well as third-party vendors and partners, could take various applications and make them IPv6 ready. Many of the company's third-party vendors did not have the resources to create their own development environments, so the ability to provide contained engineering and testing areas within the larger laboratory was important. Additionally, a comprehensive development and testing environment offered the flexibility required to support and rapidly determine the state of efforts related to the adoption of IPv6.

PLEASE DESCRIBE YOUR VENDOR SELECTION PROCESS AND WHY YOU CHOSE RED HAT IN THE END.

Comcast's Architect and Principle Engineer, John Brzozowski, had worked with competing products in the past. He decided to perform a side-by-side evaluation of other solutions and Red Hat Enterprise Linux 5. Because RHEL5 provides built-in virtualisation at the operating system level, the solution worked instantly right out of the box. It also enabled Brzozowski to build an unlimited number of guests without having to buy subscriptions for each one. Alternate solutions on the other hand, required learning a separate virtualisation solution and were significantly more expensive. Brzozowski chose RHEL 5 because of the enormous cost-savings, ease-of-use, and flexibility it provided.

WHAT ROLE DID RED HAT AND/OR JBOSS PRODUCTS PLAY IN THE FINAL SOLUTION?

Comcast's Back Office Architecture team implemented RHEL5 to create a cost-effective, highly efficient engineering and testing environment. Leveraging existing hardware, this team was able to use RHEL5 virtualisation capabilities to test different operating systems, applications, and devices utilising existing resources. Through the use of virtualisation a wide variety of operating systems can seamlessly be created in a networked environment. Outside vendors as well as internal developers have secure access to separate virtual machines specific to their objectives, ensuring their products and applications are IPv6 ready and able to support Comcast's adoption of IPv6.

Brzozowski uses RHEL5 to change his testing environment quickly and easily as needed. He decides whether to create a small number of virtual machines that require greater resources or a higher number of lower end virtual machines. Starting, stopping, and modifying the machines facilitates different testing scenarios. Because RHEL's para-virtualisation capability supports a large number of high-performing guests, Brzozowski was able to utilise lower-end servers for testing.

WHAT WAS THE OVERALL IMPACT OF THE PROJECT ON YOUR BUSINESS? (E.G. IMPROVED ROI, INCREASED COMPETITIVE ADVANTAGE, BETTER TIME TO MARKET, ETC.)

An IPv6 environment using RHEL5 virtualisation is able to react and change rapidly to the demands associated with adopting IPv6. Creating an agile, flexible infrastructure expedites the development and testing processes, which is a critical element to the overall IPv6 initiative.

WHAT VALUE DID YOU GAIN FROM IMPLEMENTING RED HAT SOLUTIONS? IF A GAIN IN EFFICIENCY, HOW WERE THOSE ADDITIONAL RESOURCES ALLOCATED WITHIN YOUR COMPANY?

Comcast's Systems Engineering Back Office Architecture team gained a higher return on investment by using RHEL5 to create its lab environment. Without the built-in virtualisation capabilities, the company would have had to purchase a significant amount of additional servers. The use of competing virtualisation solutions would have required a significantly higher investment. Instead, every dollar saved on subscriptions and physical servers can be better applied to the IPv6 initiative, ensuring thorough testing and rollout of the technology.

The flexibility of RHEL5 also empowered Brzozowski to create the resources he needs on demand. The solution makes it possible to add or subtract virtual machines and guests quickly and easily, building new systems on the fly as the testing environment and requirement change.

Additional benefits Comcast experienced from implementing RHEL5:

- * power-savings, resolving a challenge that normally arises from the installation of many nodes
- * maximum ease-of-use, flexibility to use both graphical and command line interfaces



PLEASE PROVIDE A TECHNICAL DESCRIPTION OF IMPLEMENTATION, INCLUDING THE SIZE OF DEPLOYMENT. (I.E. HARDWARE SPECS, APPLICATIONS, O/S, DATABASES, ETC.)

Two HP DL380 servers running RHEL5. Each server currently supports the virtualisation of a variety of Intel based operating systems.

Comcast's Systems Engineering Back Office Architecture team is planning to transition to higher-performing Intel servers and to increase its virtualisation capabilities specifically the number of guests per server. The company intends to test both Windows and RHEL applications and guests to ensure compliance with IPv6. Other Linux or BSD style operating systems will also be virtualised in this environment.

DID YOU LEVERAGE RED HAT SUPPORT SERVICES, TRAINING, OR CONSULTING? IF SO, PLEASE DESCRIBE YOUR EXPERIENCE?

Red Hat Support Services played an important role in the creation of the IPv6 testing environment described above. Brzozowski has completed Red Hat Certified Engineer Training, but working one-on-one with the Red Hat sales engineering team helped him implement virtualisation in his IPv6 laboratory environment successfully.

DO YOU HAVE ADVICE FOR OTHER COMPANIES FACING A SIMILAR BUSINESS CHALLENGE?

Virtualisation capabilities are powerful, saving money and increasing efficiencies, but each organisation has to determine its goals and what the added possibilities mean for them. Requirements will differ from organisation to organisation and even from project to project. Adopters of virtualisation must first identify their objectives then determine how virtualisation can benefit them.

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