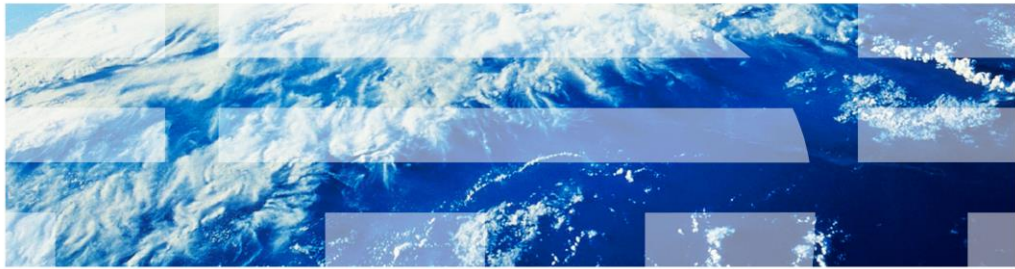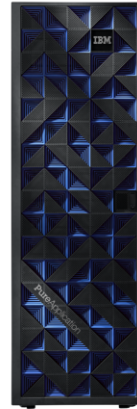# IBM PureApplication System

Overview

This presentation will introduce the key concepts and features of IBM PureApplication™ System.

Table of contents

- Current IT challenges
- Introducing IBM PureApplication System
  - Pre-entitled software
  - Non-entitled software
- Deployment models
- Integrated monitoring and management
  - Integrated console
  - Monitoring
  - License management
  - Maintenance
  - Problem determination
- Summary

This presentation begins by discussing several of the information technology challenges faced by modern organizations. It will then introduce you to IBM PureApplication System, which is designed to address those challenges. Deployment models supported by the system are covered, followed by a discussion of several of the system's integrated monitoring and management features.

Section

Current IT challenges

This section will address some of the information technology challenges that businesses are currently facing.
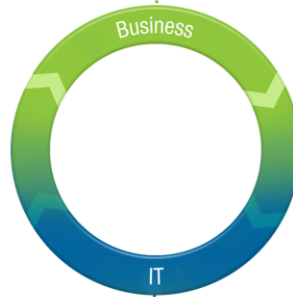
Aligning IT and business goals

Business goals
Grow top and bottom line by:

- Driving business innovation
- Make new markets
- Respond to competitive threats
- Enhance the customer experience

Typical results:
- 34% of new IT projects (US) deploy late
- 55% experience application downtime for major infrastructure upgrades once deployed

IT reality

Getting up and running
- 2-3 months to specify and procure
- 2-3 months to integrate, configure and deploy

Development operations
- 3-6 months to go from development to production

Ongoing effort
- 1-3 months to troubleshoot and tune
- Ongoing effort and downtime to maintain, scale and upgrade

From a commissioned study conducted by Forrester Consulting on behalf of IBM

4   IBM PureApplication Sytem - Overview   © 2012 IBM Corporation

Businesses want to grow, and they have goals they need to achieve. Businesses prefer to invest in innovation and new technologies, but the reality today is that IT departments are significantly constrained by the traditional computing model where the time, effort and money spent across the IT life cycle is too high to meet business needs. The time and cost required to acquire, configure and deploy systems can add up to several months, even to provision a test environment.
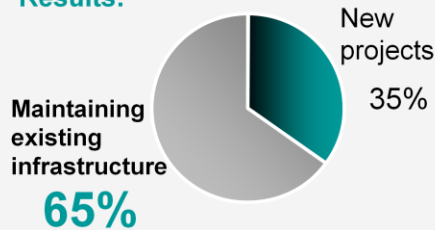
Only 1 in 5 can allocate more than half their IT budget to innovation

Least efficient data centers

Use of new technology:

43% adopt new technology quickly
1% move virtual machines to meet desired outcomes
21% use storage virtualization
3% use a storage service catalog (tiered storage)

Results:

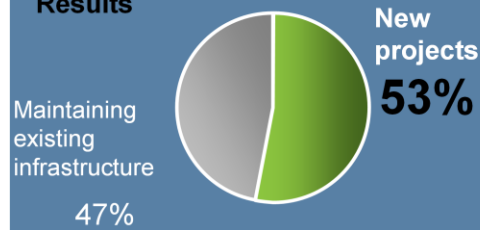New projects 35%

Maintaining existing infrastructure **65%**

Most efficient data centers

Use of new technology:

86% adopt new technology quickly
58% move virtual machines to meet desired outcomes
93% use storage virtualization
87% use a storage service catalog (tiered storage)

Results

New projects 53%

Maintaining existing infrastructure 47%

Source: 2012 IBM Data Center Study
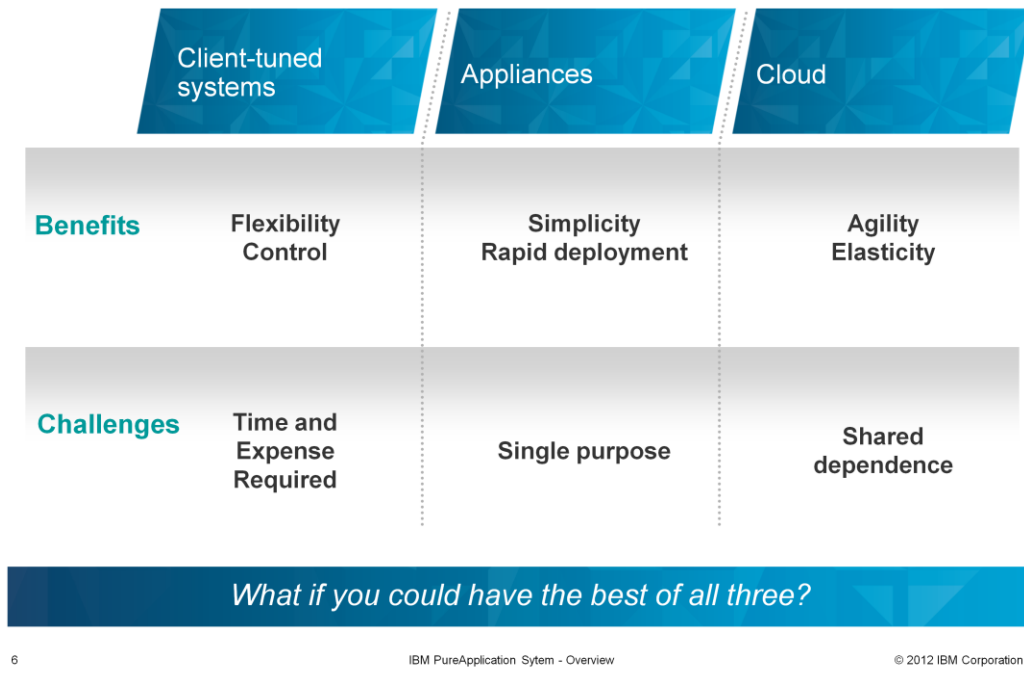
5   IBM PureApplication Sytem - Overview   © 2012 IBM Corporation

A 2012 study looked into the effectiveness of IT datacenters and discovered some interesting differences between the least and most efficient ones. On the left, the least efficient data centers were slow to adopt technology and make limited use of things like dynamic virtual machines, storage virtualization and tiered storage. On the right, the most efficient datacenters are marked differently. They are heavy early adopters of technology and the items just mentioned.

You can see what it means to the business in these ways:

On the left, the least efficient datacenters have to spend about 2/3 of their IT budgets maintaining their existing infrastructure and can only dedicate about a third to new innovation. On the right, the main difference from the most efficient data center is, they can apply over half of the their IT budgets to new innovation.

Approaches to close the gap

	Client-tuned systems	Appliances	Cloud
Benefits	Flexibility Control	Simplicity Rapid deployment	Agility Elasticity
Challenges	Time and Expense Required	Single purpose	Shared dependence

What if you could have the best of all three?

Multiple approaches have already emerged as businesses begin this shift. Businesses are tuning their own systems – using the flexibility of general purpose systems to optimize them for their business environment. However, the time and effort to do this can be very significant.

Other approaches have emerged as well. Many businesses are taking advantage of the simplicity of appliances, but are challenged by their limited flexibility. The elasticity offered by clouds is a newer approach – with its own issues around shared resources.

A new class of systems is introduced to get all three of these business options: systems with integrated expertise and built for cloud environments that combine the flexibility of general purpose systems, the elasticity of the cloud and the simplicity of an appliance.

Expert integrated systems will fundamentally change both the experience and economics of IT.

Expert integrated systems are more than a static stack of self-tuned components—a server here, some database software there, serving a fixed application at the top. Instead, these systems have three truly unique attributes.

The first is built-in expertise. Think of expert integrated systems as representing the collective knowledge of thousands of deployments, established best practices, innovative thinking, IT industry leadership, and the distilled expertise of business partners and solution providers. This is all captured into the system in a deployable form from the base system infrastructure through the application.

The second is that expert integrated systems are integrated by design. All the hardware and software components are deeply integrated and tuned in the lab and packaged in the factory into a single ready-to-go system that is optimized for the workloads it will run. All of the integration is done for you at the factory, by experts.

The third is that the entire experience is much simpler – from the moment you start designing what you need to the time you purchase – to setting up the system – to operating, maintaining and upgrading it over time. Management of the entire system of physical and virtual resources is integrated. And all this is done in an open manner enabling participation by a broad ecosystem of partners to bring their industry optimized solutions to bear.

Section

IBM PureSystems family and IBM PureApplication System

IBM PureApplication Sytem - Overview

© 2012 IBM Corporation

This section will introduce the IBM PureSystems™ family of products and IBM PureApplication System.

In April 2012 IBM introduced PureSystems with the first two family members, PureFlex™ System and PureApplication System. In November 2012, the PureData System joined the PureSystems family. Now joins the family – an expert integrated system that is optimized exclusively for delivering data services.

IBM PureFlex System integrates computing, storage, networking resources and system management to simplify and accelerate the delivery of infrastructure services. It is ideal for those clients who want to accelerate deployment and simplify management of infrastructure for building custom application platforms and application stacks.

IBM PureApplication System is a platform system designed and tuned specifically for transactional web and database applications. It's workload-aware, flexible platform is designed to be easy to deploy, customize, safeguard and manage.

IBM PureData is a perfect fit for when clients want an integrated and optimized data platform. This system contains compute and storage resources as well as data management middleware and comes in different models optimized for different transactional, analytics data workloads.

PureApplication System

PureApplication

Built-in expertise
Patterns *of expertise built from decades of experience extend business value*

Integration by design
Resource and workload optimized with complete platform-as-a-service cloud capabilities built-in

Simplified experience
An open, integrated system enabling business model and ecosystem flexibility with a single pane of glass to manage both the infrastructure and application platform

IBM PureApplication System is a workload optimized integrated hardware and software solution designed to dramatically simplify the development, provisioning, and management of applications in a private cloud environment. It features integrated management capabilities, allowing self-service provisioning of elastic applications, databases, and other workloads.

With PureApplication System, IBM has rethought some key data center concepts. The hardware and software are deeply integrated, providing an unprecedented degree of automation, performance, and simplicity. To best put this power to use for your business, carefully consider your application portfolio with an eye towards how you will take advantage of these characteristics.

Integration by design
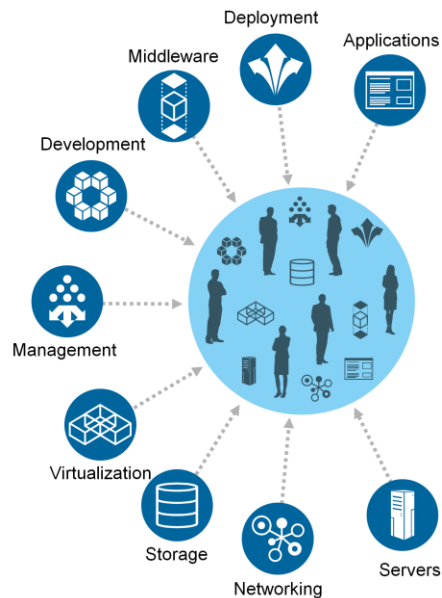
Optimizes the complete solution stack:

- All hardware and software components factory integrated and optimized
- Virtualized across the stack for efficiency
- Unified management, monitoring and maintenance
- Integrated and elastic application and data runtimes
- Application patterns allocate system and application resources for optimal performance, security and reliability

PureApplication System is integrated by design. IBM has taken the collective knowledge of integrating and tuning servers, storage, networking, virtualization and management and used it to design the system from the ground up in an optimized fashion. With PureApplication System, the middleware, development and deployment expertise is also factory integrated and optimized.

Design matters: open ecosystem on an integrated platform

Patterns of expertise
- 100+ ISV business applications
- Business intelligence
- Business process management
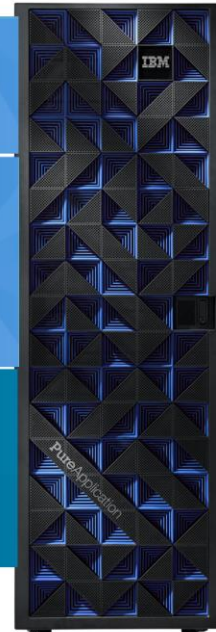- Web experience

Application patterns from IBM and partners

Application platform
- Application optimization
- System wide management
- Automation and scaling
- Caching and elasticity
- Application-centric provisioning
- Usage metering
- Security
- Monitoring
- Life cycle management
- License management
- Self-service
- Data management

Integrates an application platform optimized for enterprise applications

System infrastructure
- Integrated server, storage, network
- Power management
- Storage and VM optimization
- Virtualization
- Integrated system management
- Provisioning
- Security
- Monitoring
- Life cycle management
- System design

Inherits the capabilities of PureFlex System

IBM PureApplication Sytem - Overview

© 2012 IBM Corporation

PureApplication System inherits the capabilities of PureFlex System and builds on them. A complete application platform is integrated with the system, and patterns of expertise build decades of experience and best practices directly into the system.

Workload-optimized systems

Virtualized workloads
- Integrated middleware
- Elastic data
- Application-aware workload management

Scalable infrastructure
- Workload optimized hardware
- Virtualized storage
- Optimized networking

Integrated delivery
- Factory built and wired
- Optimized and tuned
- Simplified management

WebSphere.

IBM Workload Deployer functionality

Compute nodes

Storage

Tivoli software
Built-in monitoring and management

13   IBM PureApplication Sytem - Overview   © 2012 IBM Corporation

PureApplication System is delivered fully assembled, with compute nodes, storage, and networking hardware already installed, cabled, and tuned. It also includes integrated and optimized IBM middleware that is easy to manage and monitor using built-in tools.
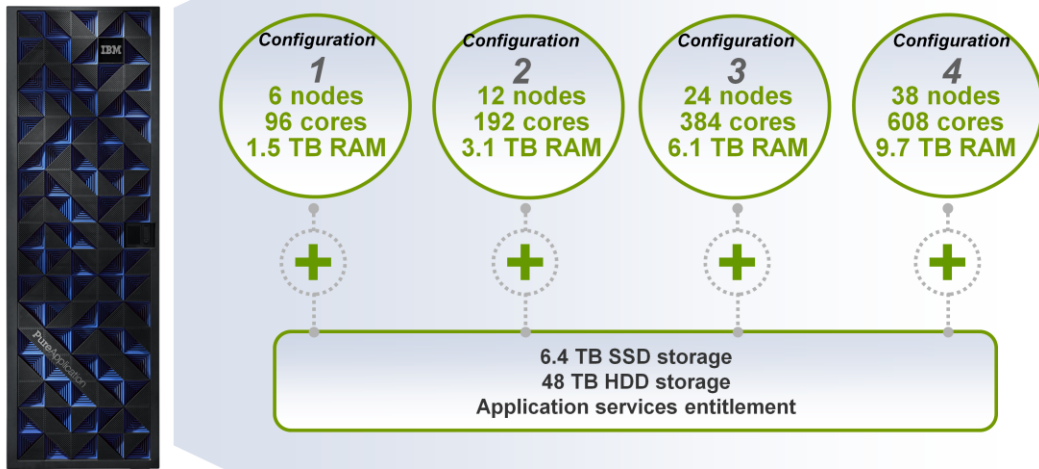
There are four available configurations of PureApplication System. All four configurations include the same storage and networking components, in addition to the same middleware patterns and management capabilities. Each configuration includes 48 terabytes of hard disk storage and 6.4 terabytes of solid-state storage. The configurations vary by the number of included compute nodes. Each compute node consists of 16 physical cores and 256 gigabytes of memory. The smallest configuration includes six compute nodes, and the largest includes 38. Upgrades to a larger system can be ordered and installed without any downtime for existing workloads.

Pre-entitled software included with PureApplication System

- Virtual system images
  - IBM OS Image for Red Hat Systems 2.0.0.1 (includes Red Hat V6.2)
  - IBM WebSphere® Application Server V7 – includes Intelligent Management Pack
  - IBM WebSphere Application Server V8 – includes Intelligent Management Pack
  - IBM WebSphere Application Server V8.5 – includes Intelligent Management Pack
  - DB2® Enterprise V9.7
  - DB2 Enterprise V10.1
  - Advanced Middleware Configuration V1.0

- Virtual application patterns:
  - Application Pattern for Java Pattern 1.0.0.1
  - IBM Web Application Pattern 1.0.0.5 (based on WebSphere Application Server V7)
  - IBM Web Application Pattern 2.0.0.2 (based on WebSphere Application Server V8)
  - IBM Transactional Database Pattern 1.1.0.3
  - IBM Data Mart Pattern 1.1.0.3

- Additional tools
  - Image Construction and Composition Tool
  - Plug-in development kit

• **Included in PureApplication System**
• **No upper limit on usage within the system**
• **Refer to Information Center for updated list**

IBM PureApplication Sytem - Overview   © 2012 IBM Corporation

This slide shows the list of pre-entitled software included with PureApplication System. The system includes IBM middleware patterns that use WebSphere Application Server and DB2 Enterprise. It also includes the Advanced Middleware Configuration tool for application on-boarding, and the Image Construction and Composition Tool for building custom virtual images for use with PureApplication System. There is no license usage limit on this included software for usage within PureApplication System. See the Information Center for a current list of pre-entitled software.

Non-entitled software optimized for PureApplication System

- Virtual system images – based on RedHat Enterprise Linux® 6.2
  - WebSphere MQ
  - WebSphere Message Broker
  - IBM Business Process Management
  - WebSphere Operational Decision Management (iLog, WebSphere Business Events)
  - WebSphere Business Monitor
  - Informix®
  - WebSphere Portal
  - WebSphere Transformation Extender
  - Predictive Enterprise
  - SOA Policy, SOA Policy Gateway
- Virtual application patterns
  - IBM Business Intelligence Pattern for Cloud (Cognos®)
  - IBM Messaging Pattern
  - WebSphere Commerce
  - Mobile Pattern
  - C++

• **Shipped separately**
• **Need entitlement**
• **Availability dates vary**
• **See the PureSystems Centre for current list**

16 · IBM PureApplication Sytem - Overview · © 2012 IBM Corporation

Many other software products have also been built and optimized for use with PureApplication System, but do not come included with the system. These products can be purchased and loaded onto PureApplication system through the PureSystems Centre, a repository of products built for the PureSystems family. PureApplication System includes license management capabilities, so you can keep track of license usage and availability for non-entitled software products. Availability dates for some of these products are later than the general availability date for PureApplication System. See the PureSystems Centre for a current list of available products.

Section

Deployment models

IBM PureApplication Sytem - Overview
© 2012 IBM Corporation

This section will introduce you to deployment models in IBM PureApplication System.

Patterns of expertise

- A pattern is pre-defined architecture of an application

- For each component of the application:
    - Pre-installation on an operating system
    - Pre-integration across components
    - Pre-configured and tuned
    - Pre-configured monitoring
    - Pre-configured security integration
    - Life cycle management

- Everything a deployable form
    - Repeatable deployment with full life cycle management

- Delivering superior results:
    - Agility: Faster time-to-value
    - Efficiency: Reduced costs and resources
    - Simplicity: Simpler skills requirements
    - Control: Lower risk and errors

IBM uniquely builds expertise into PureApplication System with patterns of expertise. Patterns of expertise are proven best practices and expertise for complex tasks learned from decades of client and partner engagements that are captured, lab tested, optimized and then built into the system. This isn't just a blueprint or set of instructions–the expertise is built in and inherently usable. Patterns deliver faster time to value by taking out manual steps and automating delivery. Patterns improve efficiency and simplicity by reducing costs and resources, and reducing the amount of in-house expertise required for deployment of solutions. Patterns also increase control: repeatable, optimized deployments reduce the risk of human error.

IBM delivers patterns of expertise in two different models, known as "virtual systems" and "virtual applications." Virtual systems provide an automated model for deploying middleware topology patterns. They allow you to quickly deploy traditional workloads in a virtualized environment in a repeatable fashion. Products deployed using the virtual systems model are managed using the existing management tools provided by those products. Virtual applications provide a highly automated, policy-based deployment model in which you define application components and policies that specify the needs of the application. The virtual application model is application-centric, whereas the virtual system model is middleware topology-centric. The virtual application model has a highly simplified administrative model, exposing fewer administrative functions than the virtual system model. PureApplication System also supports the "virtual appliance" deployment model, which allows you to run custom software images of your choosing within the system, though virtual appliances do not feature the robust management and monitoring features available for virtual systems and virtual applications.

Section

Virtual application patterns

This section will discuss the virtual application deployment model.

Virtual application web application pattern

- A collection of application components, behavioral policies and their relationships
  - Core components of the pattern include web applications, databases, queues, connections to existing resources, business process models, batch jobs, mediations, and more
  - Core policies of the pattern include high availability, SLAs, security, multi-tenancy, isolation, and more
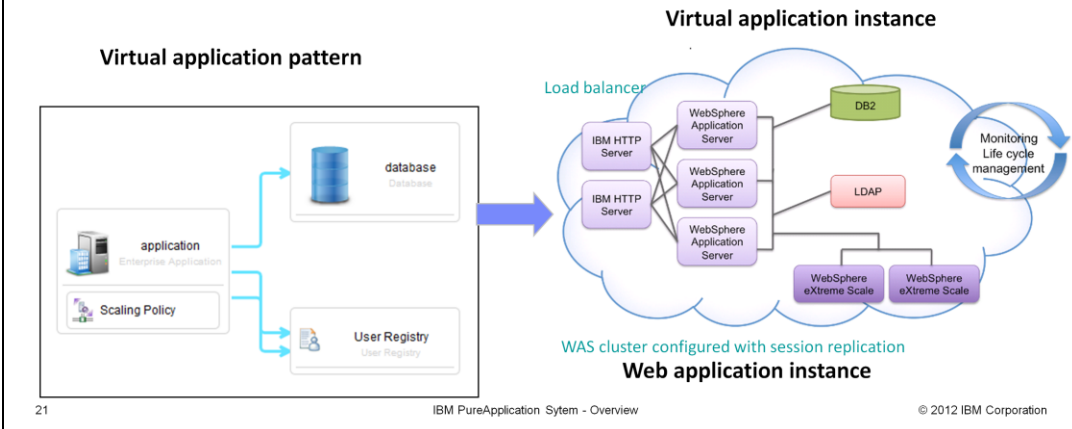
Virtual applications represent a platform-as-a-service in which your application is the focal point. You start with your application and define requirements, such as what services it requires and the qualities of service that should be applied. Based on the assets defined in your virtual application pattern, PureApplication System will automatically deploy and configure the appropriate middleware components to run your application. This simplifies the end-to-end process of creating, deploying and configuring the middleware components for your applications. PureApplication System handles all of those tasks for you.

PureApplication System support the most common transactional web application types through the virtual application deployment model.

Virtual application pattern types

- Pattern for web applications consists of application support based on
  - WebSphere Application Server
  - Tivoli® Directory Server
  - WebSphere eXtreme Scale
  - Connectors to remote systems
    - WebSphere MQ, DB2, DB2/z, CICS®, LDAP, and others

- Patterns for database provides support for DB2 in a database-as-a-service model
  - Transactional database pattern
  - Data mart pattern

- Pattern for Java applications
  - Quickly allows you to provision and run Java apps.

- Plug-in development kit available to create custom pattern and plug-ins for custom virtual applications

IBM PureApplication Sytem - Overview   © 2012 IBM Corporation

IBM PureApplication System includes several pre-installed pattern types. The pattern for web applications is a transactional web application platform built on WebSphere Application Server, Tivoli Directory Server, and WebSphere eXtreme Scale. The pattern for database applications is a database-as-a-service platform built on DB2, and can be used in concert with the pattern for web applications. The pattern for Java applications provides a rapidly deployable pattern for provisioning standard Java applications. All virtual application patterns support integrated monitoring, logging, scaling, and failure recovery capabilities.

Virtual application builder

- Graphically assemble your virtual application patterns
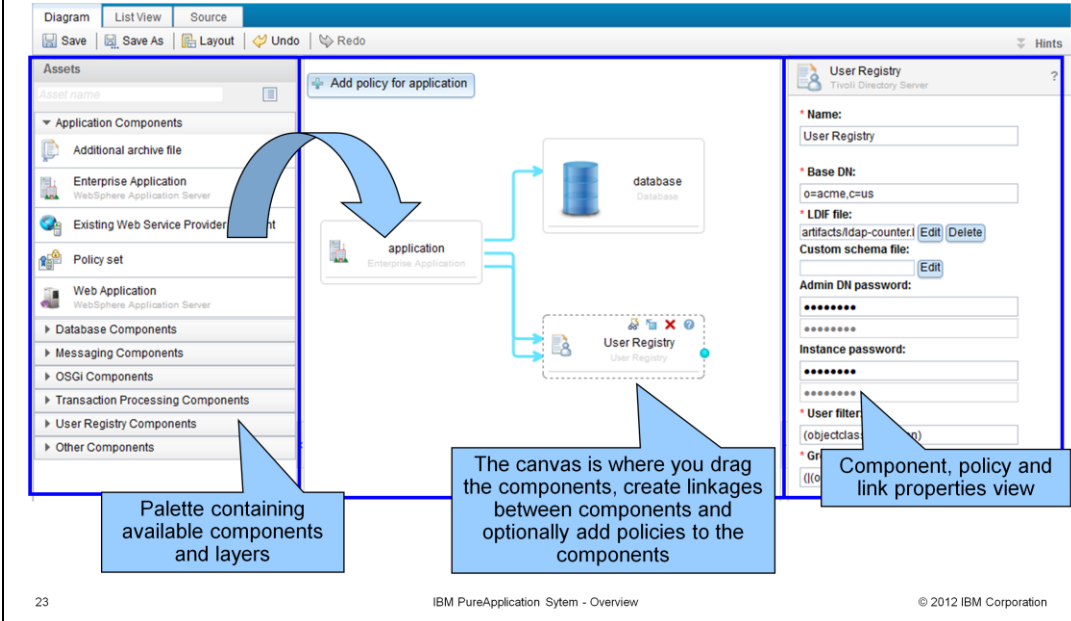
The virtual application builder allows you to graphically assemble and configure your virtual application. There are three main parts to the builder interface. The palette on the left contains application components that can be used in your pattern. Drag a component into the canvas in the middle to add it to your application. The properties panel, to the far right, enables you to edit the properties of components on the canvas. In the image shown here, the user registry component is selected on the canvas, and the properties panel displays fields for editing the registry's name, distinguished name, LDIF file, and database schema.
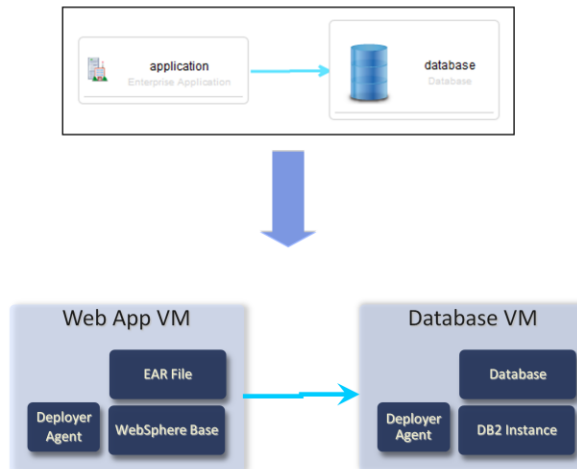
Consider a simple virtual application pattern that consists of an enterprise application component and a database component. When deployed, PureApplication System instantiates two virtual machines to implement this pattern. One virtual machine includes an instance of WebSphere Application Server running the EAR file that you uploaded into the virtual application builder interface. The other virtual machine includes an instance of DB2 running the database defined by the DDL file that you uploaded into the virtual application builder interface. Both virtual machines also include IBM agents that interact with PureApplication System's built-in monitoring and logging infrastructure.
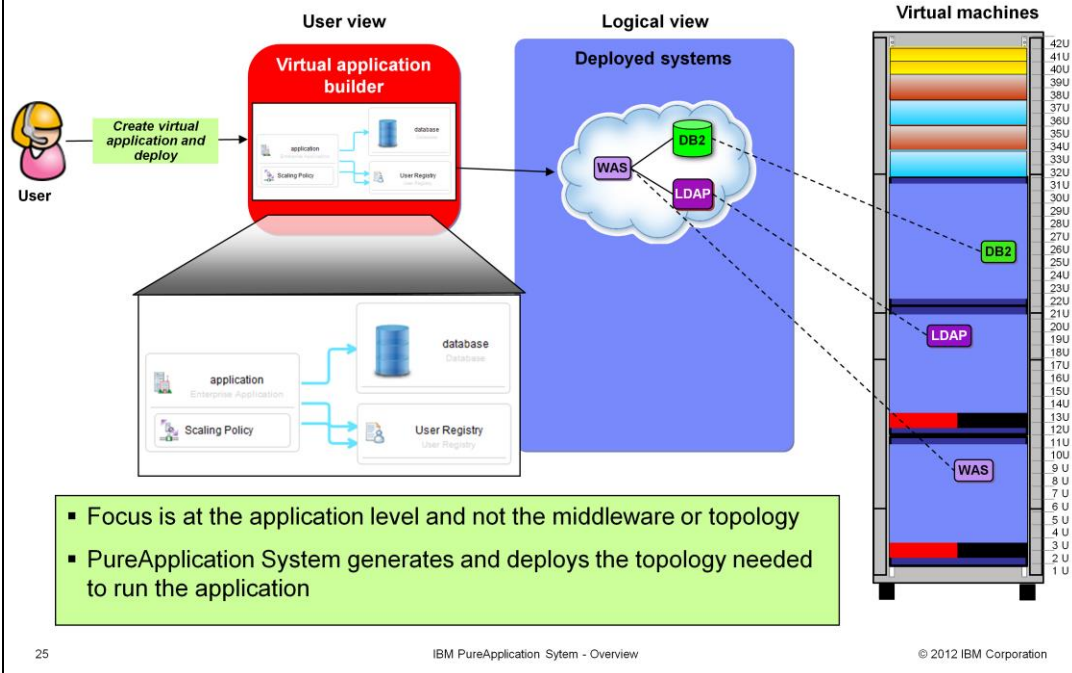
Since the focus of the virtual application model is on the application and not on the middleware, you only define application components and policies in the virtual application builder—there is no mention of middleware products or topologies. When the virtual application is deployed, PureApplication system generates a logical topology built from the required middleware products, which is in turn deployed in virtual machine instances running as guests on the compute node hardware.

Virtual application database pattern

- Dramatic simplification of databases
  - Deployment agility (self-service front end, hibernate/wakeup, etc)
  - Implicit feature enablement
  - Improve the "field quality" of database applications by enforcing best practices implementations

- Industrialization of database hosting
  - Automated operations
  - Standards
  - Isolation

- Improve speed of adoption
  - Make it trivial to get a new database
  - Easy import of existing databases
  - Oracle compatibility mode

　　　IBM PureApplication Sytem - Overview　　　© 2012 IBM Corporation

The virtual application pattern for databases provides a database-as-a-service platform designed to dramatically reduce the time and cost necessary to deploy and use databases for your applications. The virtual application pattern for databases makes it simple for you to provision and deploy databases in a self-service fashion in a matter of minutes, rather than having to provision specific hardware, and enlisting a database administrator to create and configure the database. The virtual application pattern for databases is pre-tuned and pre-integrated with PureApplication System's monitoring and management capabilities. The pattern is implemented by IBM DB2 middleware and is compatible with both DB2 and Oracle databases.

Shared services for web applications

- Built-in support for shared cloud services
    - Life cycle management of the service itself
    - Support for programmatic access to service resources
    - Automated wiring of patterns into service capabilities

- Services offered
    - Caching service
        - Based on WebSphere eXtreme Scale (WXS) caching technology
        - Configured for HTTP session replication
    - Proxy service
        - Based on secure Java proxy technology
        - Support for dynamic registration of new endpoints
        - Automatically connected to web applications
    - Monitoring services for monitoring hardware, OS and middleware

　　　IBM PureApplication Sytem - Overview　　　

PureApplication System also includes shared services that can be used by virtual applications. The system manages the life cycle of these services, and they can be easily used as part of a virtual application pattern, by adding policies to the pattern. The caching service is based on WebSphere eXtreme Scale technology, and provides a simple cache that can be used by virtual applications. In the included web application pattern type, the caching service is pre-configured to be used for replicating HTTP sessions across servers. The proxy service is based on IBM's secure Java proxy server technology, and is used to dynamically route incoming requests to application server endpoints in virtual applications. It is automatically connected to web applications when a scaling policy is defined. The included monitoring service is a part of all provided virtual application patterns, and provides integrated monitoring for virtual applications at the hardware, operating system, and middleware levels.

Custom patterns/plug-ins for virtual applications

- Available with Plug-in Development Kit (PDK)
  - Available for download from IBM Workload Deployer/IBM PureApplication System
  - Extend or augment existing capabilities with new pattern types and plug-ins
    - Deployable as virtual applications

28   IBM PureApplication Sytem - Overview   © 2012 IBM Corporation
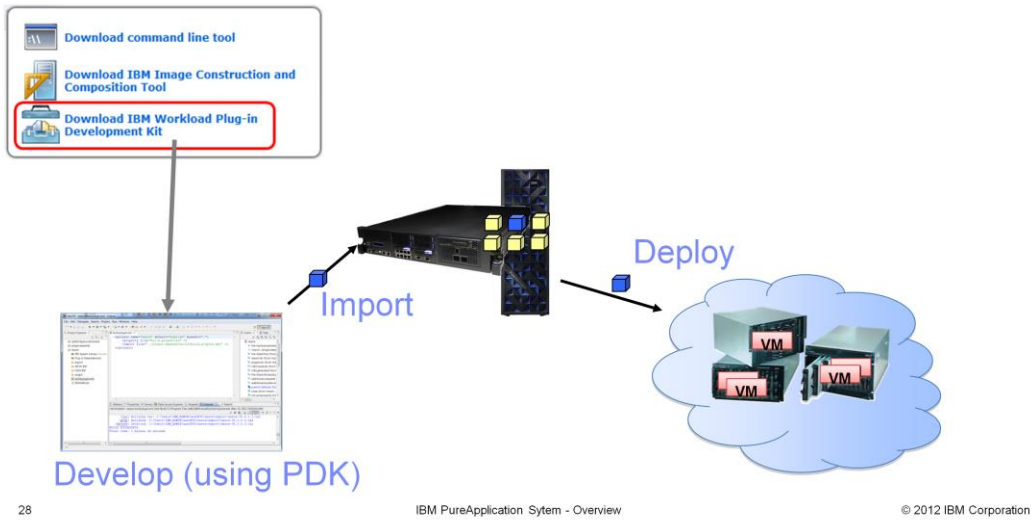
With IBM Workload Deployer and IBM PureApplication System, you are able to configure each as a Cloud Provider in the IBM Image Construction and Composition Tool. Once your cloud provider is set up, the Image Construction and Composition Tool is able to display and import VMware and AIX® images from the image catalog. The Image Construction and Composition Tool allows you to extend these images with Image Construction and Composition Tool bundles, and synchronize /capture those images in the cloud provider. Finally, IBM Workload Deployer and IBM PureApplication System can deploy these images to either a VMware or a PowerVM hypervisor (IWD only).

Virtual system patterns

IBM PureApplication Sytem - Overview

© 2012 IBM Corporation

This section will cover the virtual system deployment model.

Virtual systems overview

- Virtual systems patterns are a combination (logical grouping) of virtual image parts
  - Combined to create a specific topology for a given deployment need
  - Example: "WebSphere Application Server cluster" pattern
    - Deployment manager, one or more custom nodes, an IBM HTTP server and configuration scripts for installing enterprise applications
- Virtual system topologies contain:
  - One or more parts from IBM-provided hypervisor edition images of IBM middleware products or custom hypervisor images
  - Add-ons
  - Script packages
- PureApplication System includes pre-loaded virtual system patterns based on years of expertise
  - Create custom virtual system patterns from scratch or extend existing patterns
  - Full administrative access to the deployed topology is available

IBM PureApplication Sytem - Overview

Virtual system patterns are a collection of middleware parts that are connected to build a topology for a particular type of deployment. For example, a "WebSphere Application Server cluster" pattern can contain a deployment manager, one or more custom nodes that are members of the cell, an IBM HTTP server, and configuration scripts that are used to install and configure enterprise applications. The middleware parts that are used to build these patterns are known as "virtual images." IBM provides many virtual images that contain IBM middleware products that are designed to run in virtual machine environments. You can also include custom virtual images in your virtual system patterns. The focus of a virtual system pattern is on the middleware topology, as opposed to virtual application patterns, which focus on application components and policies. In a deployed virtual system instance, you have full access to administrative tools, such as the WebSphere Application Server administrative console. This differs from virtual application instances, with which you can only interact through the PureApplication System workload console.

Virtual system pattern editor
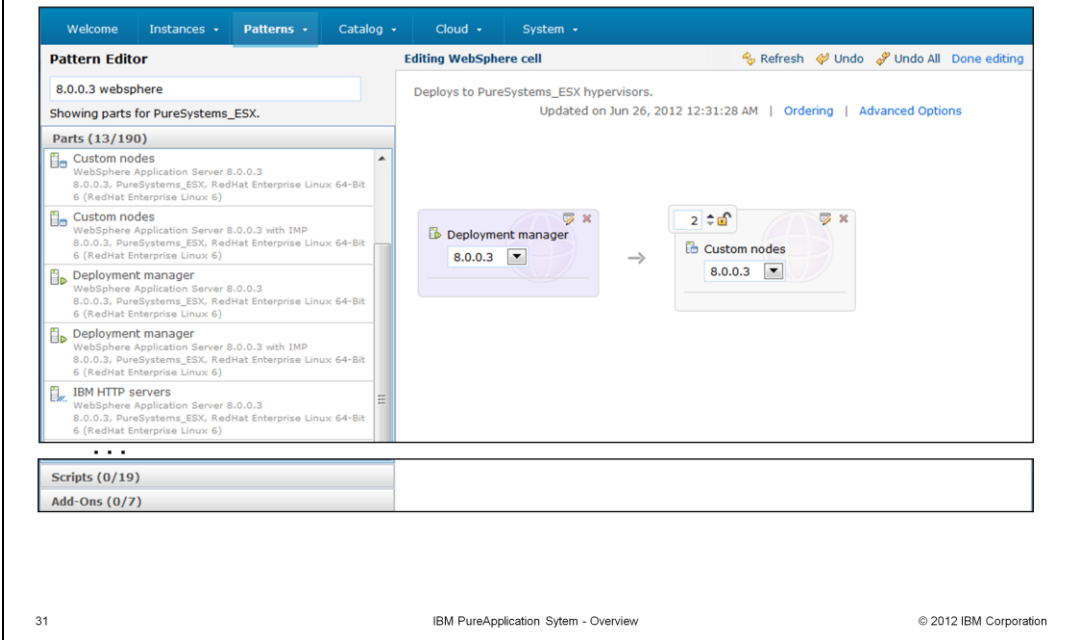
Here you see the virtual system pattern editor, which can be used to build new virtual system patterns and modify existing ones. The palette on the left includes all of the virtual images, script packages, and add-ons that are available on your system. Dragging items from the palette to the canvas on the left adds them to your virtual system pattern. In this example you see a virtual system pattern that includes a WebSphere Application Server V8.0.0.3 deployment manager and two WebSphere Application Server V8.0.0.3 custom nodes. Note that the number at the top left of the "custom node" element is used to change the number of custom nodes in the cell, and the version of the product can be chosen using the menu in the middle of the element.

Virtual systems: logical and physical views
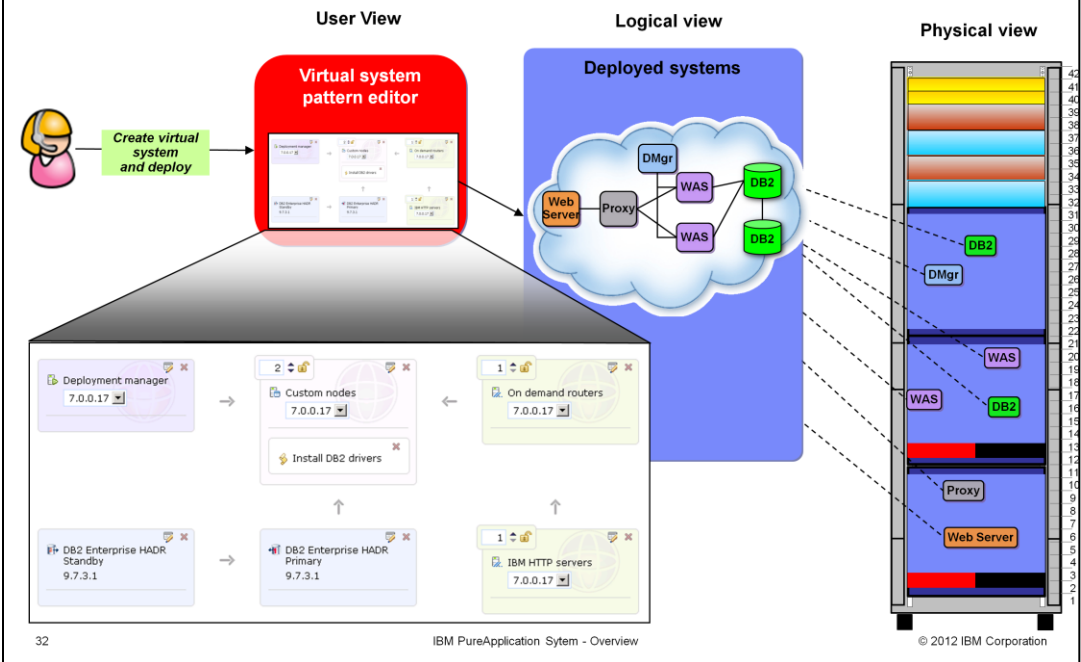
When creating a virtual system pattern in the pattern editor, you create a logical representation of the environment that you want to deploy, including middleware products and configuration scripts. When you deploy the virtual system, PureApplication System instantiates virtual machines running on the compute nodes inside the rack to implement each of the parts in your pattern.

Section

Custom virtual system images

This section will discuss custom images for use in virtual system patterns.

Creating custom images

- PureApplication System 'extend and capture' function
    - Quickly allows you to extend any image in the catalog to add your own customization
    - Select image, extend it, customize the image and capture it back in the catalog as a new image

- IBM Image Construction and Composition Tool (ICCT)
    - Create your own operating system image
    - Create images with any software content you want
    - Add content to IBM supplied images
    - Deploy your custom images as part of virtual system pattern deployments
    - Create images for multiple clouds and virtualization platforms using the same tool

　　IBM PureApplication Sytem - Overview　　

PureApplication System also supports virtual system patterns that contain custom images that you have built or modified. For example, you might use a custom image if your pattern requires a software product from another vendor, or corporate standards require that all deployed instances contain a particular operating system component. There are two supported ways to create custom images. The "extend and capture" function allows you to choose an existing image, customize it, and then "capture" it back into the catalog to save your changes as a new image. IBM also provides the image construction and composition tool, which allows you to build your own custom images, including the operating system and middleware of your choice.
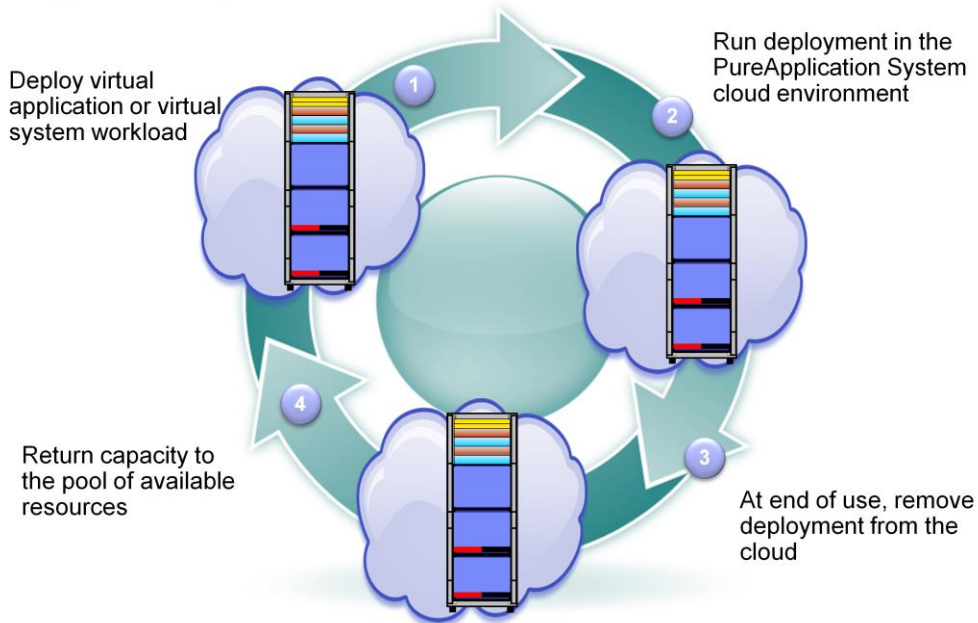
Once you have the PureApplication System in place, with your patterns defined for standardized, automated deployments of virtualized environments, you have the ability to control how you organize and use your cloud resources. You can deploy your patterns quickly and easily and run your virtualized images and workloads in your private cloud. Run the deployment as long as it is needed, then remove it from the cloud when no longer needed. This allows you to return the capacity to the general cloud pool of available resources so that it is available to host new deployments.

Using the rapid, repeatable deployment model provided by PureApplication System, you no longer have to worry about keeping environments around "just in case" they are needed again. If you do need an environment, such as a system for running specific tests, back after it has been removed, all you need to do is re-deploy the pattern, and a new copy of the environment is ready to use in minutes.

Section

Management and monitoring

This section will cover using the integrated console for PureApplication System management and monitoring.

Integrated console for unified management

Multi-user, role-based interface for managing workloads , configuring hardware , monitoring, and other functions

Both the system console and the workload console have welcome screens that provide quick links to commonly used functions, and links to download tools that can be run on your workstation. This slide shows the welcome screen for workload console and quick links for working with Virtual Applications.

PureApplication System includes patterns to deploy IBM Image Construction and Composition tool as a workload in your cloud environment. The download link shown here gives you the option to run the tool outside of PureApplication System.

PureApplication System management

- Management for:
  - Software and firmware patches
  - Hardware
  - Network virtualization
  - Storage provisioning
  - Licenses for workloads provisioned
  - Auditing
  - Security
  - Monitoring of hardware and workloads

IBM PureApplication Sytem - Overview © 2012 IBM Corporation

PureApplication System provides a unified "single pane of glass" for managing the entire system. The integrated console provides monitoring and management interfaces for system hardware, interfaces for working with virtualized storage and networking, license usage monitoring, user auditing, and security configuration. All of these system management functions are provided through the same interface used for monitoring and management of your workloads.

PureApplication System monitoring

Runs on…

Products that run on PureApplication System can be monitored through "expanded monitoring" or by integrating with existing monitoring products

- WebSphere MQ
- WebSphere Message Broker
- SAP
- Oracle

Expanded monitoring capabilities

Included in…

PureApplication System comes with monitoring for everything that is entitled in the System purchase

- Hardware
- OS (RHEL)
- Hypervisor
- WebSphere Application Server
- DB2 Enterprise
- Java pattern
- Transactional database pattern
- Data mart pattern
- Web application pattern

Included monitoring capabilities

IBM PureApplication Sytem - Overview © 2012 IBM Corporation

PureApplication System includes pre-configured monitoring capabilities for monitoring the hardware components of the system itself in addition to workload types that are provided with the system. Workload monitoring capabilities include monitoring agents for the hypervisors, the operating system, and the included middleware products, such as WebSphere Application Server and DB2 Enterprise. In addition to the included monitoring capabilities, PureApplication System also supports monitoring for additional workload types, including WebSphere MQ and WebSphere Message Broker, though they are not included with PureApplication System. These expanded monitoring capabilities must be purchased separately.

PureApplication System's monitoring capabilities are designed to provide you with high-level information in a simple top-level interface, from which you can then drill down to access finer grained information about the components that interest you. Users with administrative privileges can monitor the entire system, while regular users can drill down to get additional information for only their own deployments.

License management

Total available licenses:

WebSphere Message Broker: 4000 PVUs (Processor Value Units)

WebSphere MQ: 3000 PVUs

300 PVUs
WebSphere MQ

600 PVUs
WebSphere Message Broker

2000 PVUs
WebSphere MQ

I need 600 PVUs of WebSphere MQ. Are they available?
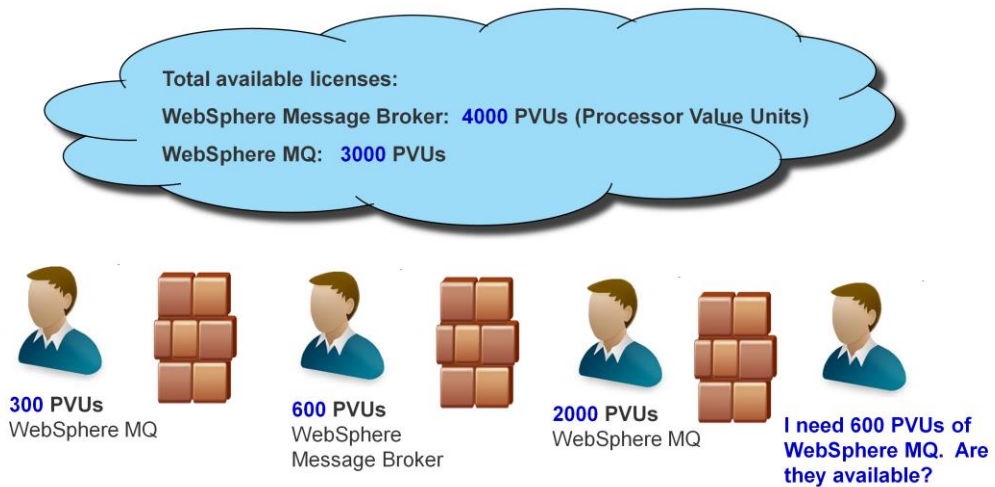
Without license management, no single person knows the current license usage in a shared, virtualized environment

41   IBM PureApplication Sytem - Overview   © 2012 IBM Corporation

PureApplication system includes easy-to-use tools for managing software license usage within the system. While PureApplication System includes unlimited usage licenses for WebSphere Application Server and DB2 Enterprise Server Edition, other software products can also be licensed for use within the system. For instance, if an organization owns licenses for WebSphere Message Broker and WebSphere MQ, the administrator can enter the total number of licenses owned into the integrated console. PureApplication System will then keep track of the licenses used for that product in real time, as virtual machines are created and destroyed, so that individual users don't have to know how many licenses are in use by other users. License usage can be monitored on a per-server basis or by using the processor value unit model, depending on which type of software license you have purchased.

In addition to monitoring and optionally enforcing license usage limits, PureApplication System also supports exporting historical license usage information for use in spreadsheets or other tools that you might use to analyze license usage over time.

## Facilities for migrating applications to PureApplication System

1 Includes Advanced Middleware Configuration tool for physical-to-virtual migration of web applications

2 Whitepaper and assessment checklist for determining whether to use virtual applications or virtual systems

PureApplication System is designed to be able to run most of your existing enterprise applications. The Advanced Middleware Configuration tool is provided with PureApplication System to help you automate the process of migrating an application from your existing infrastructure into a virtual system pattern within PureApplication system. IBM also provides a whitepaper and application assessment checklist to help you determine if your applications are best suited to be deployed in virtual systems or virtual applications.

IBM PureApplication System - maintenance types
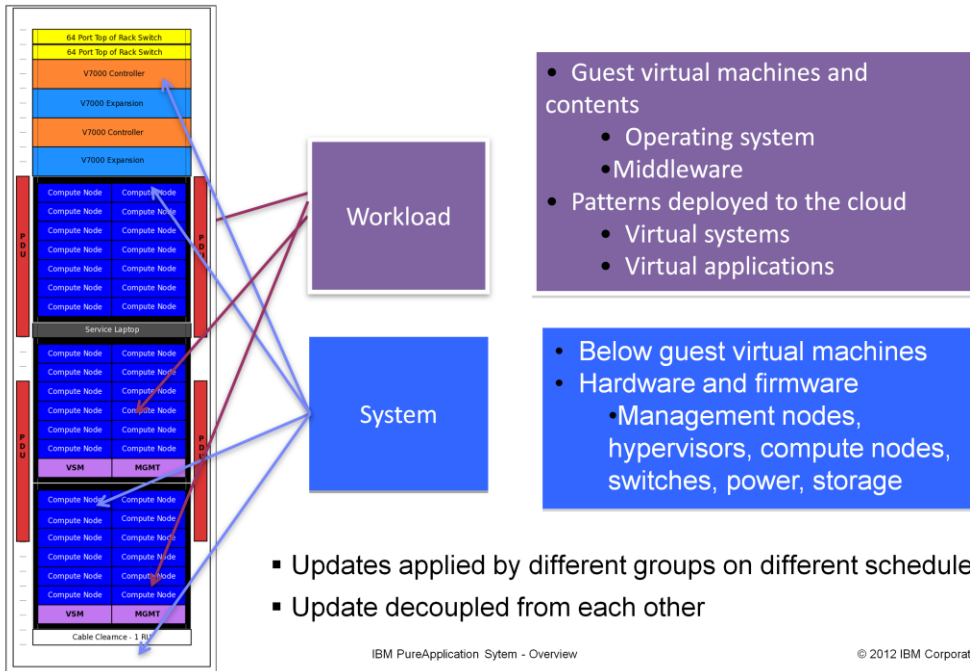
PureApplication System maintenance is divided into two categories. System maintenance includes updates for components that are part of the system itself: the hardware components, hypervisor software, and management software. Workload updates, conversely, include updates to everything contained within the virtual machines that run workloads on the system: operating system updates, middleware updates, and updates to virtual system and virtual application patterns. The two types of updates can be applied independently, since they are likely to be applied by different teams and on different schedules.

Problem determination facilities

- PureApplication System facilities to assist troubleshooting
  - Logs created from PureApplication System and deployed workloads
    - System logs and workload logs are separate
  - Events from underlying system hardware and software
  - Hardware map in the console to graphically show hardware status

PureApplication System includes several capabilities to assist with troubleshooting. System logs track actions performed by the system components, and you also have access to all of the logs created by your workloads, such as WebSphere Application Server or DB2 logs. In addition to the log data, the system also collects and notifies you of events generated by the system hardware or software. The integrated console also provides a tool called the "hardware infrastructure map," which provides a graphical view of all of the system hardware, making it easy to identify possible hardware issues and drill down to gather more information.

Events

- Events with different severity shown in the system console

Here is an example of the event notification panel in the system console, which allows you to view events by severity, type, status, and time, among other criteria.

Hardware infrastructure map

Infrastructure Map (Graphics View)   🔄 Refresh   ⬚ Switch to Tree View

Default | Status | LED | Temperature | Performance | Show Component Name ON

Legend
- All
- ☒ Critical
- ☒ Warning
- ☒ CPU utilization
- ☒ Memory utilization
- ☒ Storage utilization
- ☒ Network utilization
- ☒ Virtual machines
- ☒ Volumes

Display overlay options

System: PureApplication System

Top of Rack Switch
Top of Rack Switch
Storage Node Expansion
Storage Node
Storage Node Expansion
Storage Node

Compute Node
Compute Node
Virtualization System Manager

System hardware components

Compute Node
Compute Node
Virtualization System Manager
Compute Node

Storage Expansion 78N027A

▼ Summary

Status: ▶ Available
Type: Storage Expansion
Firmware:
Capacity: 12.36 TB
Free Capacity:

▼ Default

Critical: 0
Warning: 0
CPU utilization:
Memory utilization:
Storage utilization:
Network utilization: 37.0%
Virtual machines:
Volumes:

Attributes of selected component

▼ Detail

Bay	State	Capacity
1	▶	558.411 GB Hard drive disk
2	▶	558.411 GB Hard drive disk
3	▶	558.411 GB Hard drive disk
4	▶	558.411 GB Hard drive disk
5	▶	558.411 GB Hard drive disk
6	▶	558.411 GB Hard drive disk
7	▶	558.411 GB Hard drive disk
8	▶	558.411 GB Hard drive disk
9	▶	558.411 GB Hard drive disk
10	▶	558.411 GB Hard drive disk
11	▶	558.411 GB Hard drive disk
12	▶	558.411 GB Hard drive disk
13	▶	558.411 GB Hard drive disk

47   IBM PureApplication Sytem - Overview   © 2012 IBM Corporation

Here is a sample display of the hardware infrastructure map. It displays data for all of the hardware components in the system, including overall status, graphical representations of hardware LEDs, utilization, temperature, and performance data. As shown, the entire system and basic status are displayed by default. If there are errors or warnings for any of the hardware components, they are shown directly in this default view. Clicking on any component in the map will display more detailed information about the component. In the example shown, a storage expansion unit has been selected, and the panel on the right displays basic information about the expansion unit as a whole, such as errors, warnings, and utilization statistics. It also displays the current state of each of the individual disk drives contained in the storage expansion unit.

Section

Summary

IBM PureApplication Sytem - Overview

© 2012 IBM Corporation

This section will summarize the presentation.

Summary

- IBM PureApplication System is a game changer
- PureApplication System provides a powerful and easy to deploy private cloud
  - Pre-assembled rack provides integrated hardware and software
- Integrated hardware and software system designed to dramatically simplify the development, provisioning, and management of applications
- Includes integrated management capabilities, allowing self-service provisioning of elastic workloads
- Supports multiple deployment models to cater to variety of needs
- Optimized for IBM middleware, support for other software

IBM PureApplication Sytem - Overview

IBM PureApplication System is a game-changing product that provides a powerful and easy to use private cloud that is delivered to your data center already assembled, integrated, and optimized. It builds decades of hardware and software expertise into an easy-to-manage system that dramatically simplifies the development, provisioning, and management of applications in a virtualized private cloud environment. The integrated management tools enable self-service provisioning of elastic workloads, including enterprise applications and databases. The virtual application deployment model provides a simplified, application-centric model for deploying and managing workloads in a highly automated fashion. The virtual system deployment model provides a more flexible, topology-centric model for deploying complex applications in a virtualized environment. The system is optimized for workloads based on IBM middleware, and supports the deployment of custom images containing software from other vendors.

Trademarks, disclaimer, and copyright information