Cloud. Pure and simple.
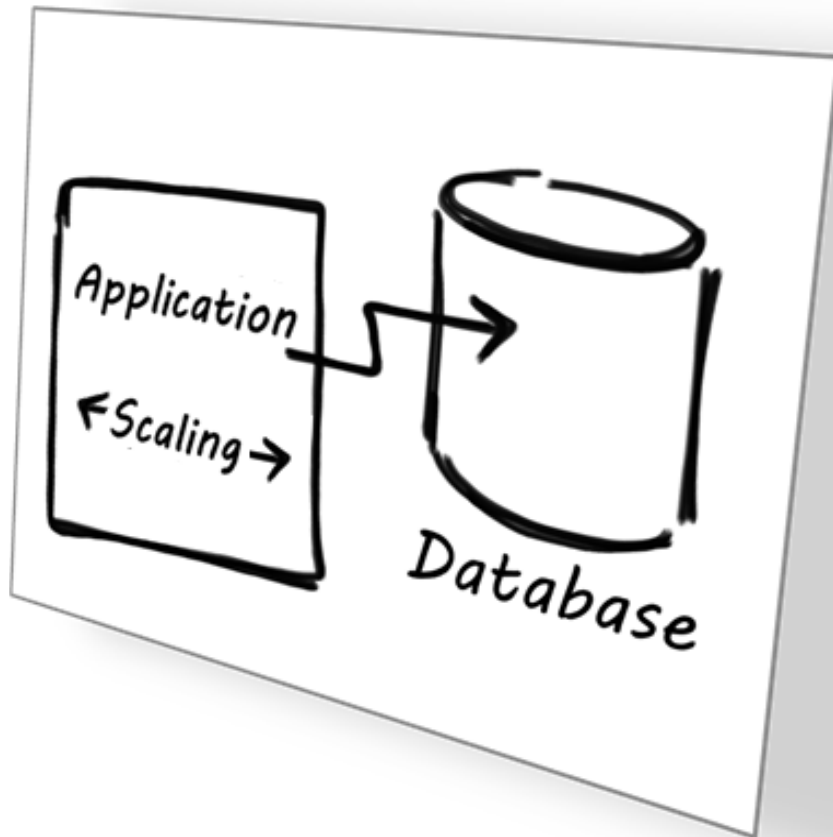
Accelerate application deployment
with Patterns of Expertise
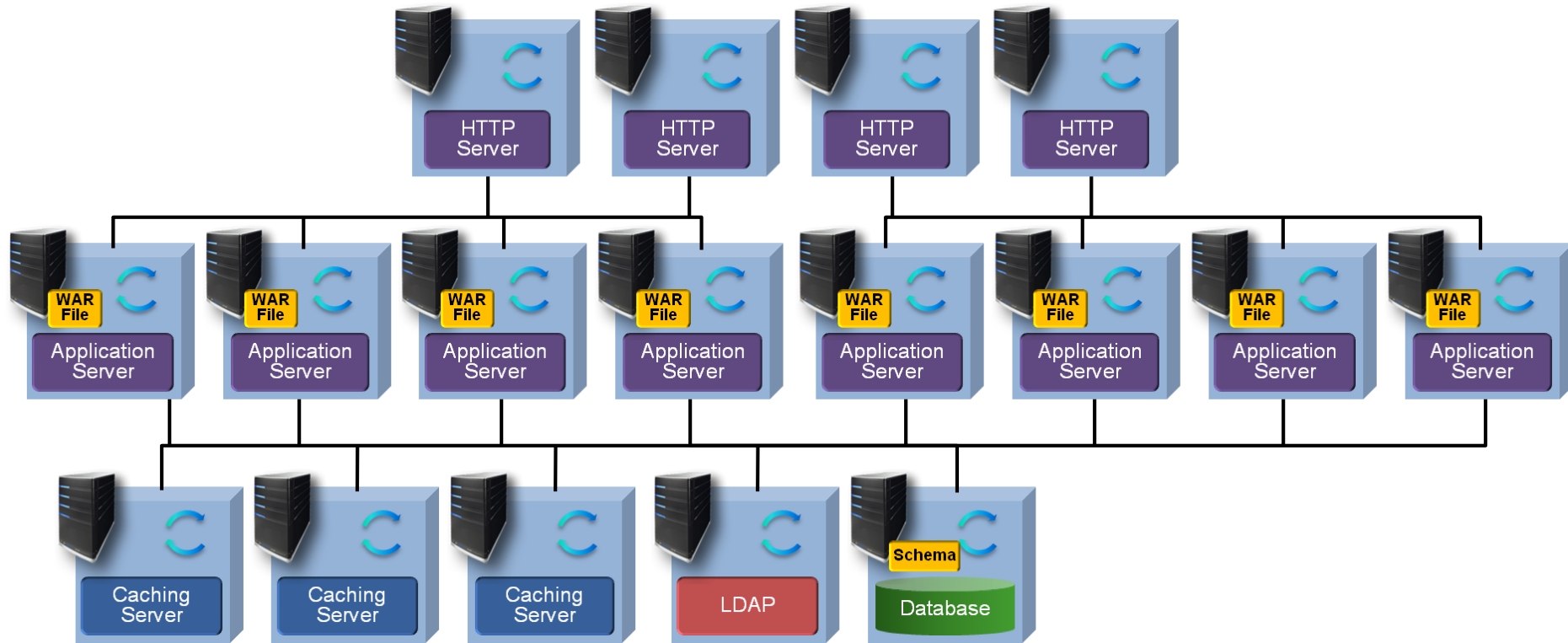
What the business wants…   What's required…

Monitoring Lifecycle Management
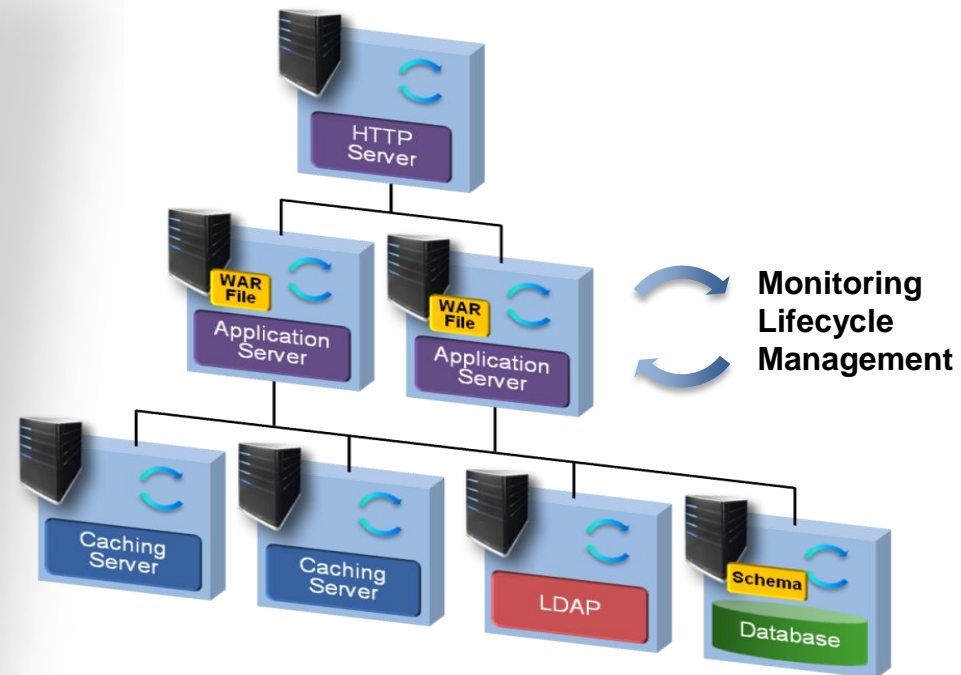
What will be needed tomorrow…

Monitoring
Lifecycle
Management

Manual deployment: inconsistent, labor intensive, and prone to errors
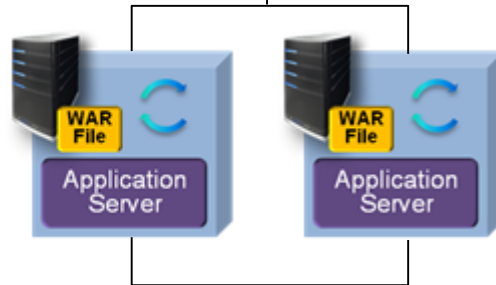
*Example: Simple two-node Web application cluster*

Deployment Administrators

HTTP Server

Install OS and fixes
Install HTTP server
Configure to distribute requests

15 hours for initial deployment **only***

Application Server **Application Server**
WAR File WAR File

Install OS and fixes
Install application server
Create cluster with two members
Connect application servers to the database
Configure session replication to support failover
*Tune cluster for performance*
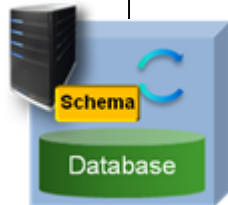
Database
Schema

Install OS and fixes
Install and configure database
Tune database for performance

*Source: Internal CPO study

4

Patterns of Expertise streamline application deployment

What is a pattern?

- A pre-defined architecture for an application

  - Provided in a deployable form, resulting in repeatable deployment with full lifecycle management

- For each component of the solution (e.g. Web server, database, etc.):

  - Pre-installed on an operating system
  - Pre-integrated components
  - Pre-configured and tuned
  - Pre-configured monitoring
  - Pre-configured security
  - Lifecycle management

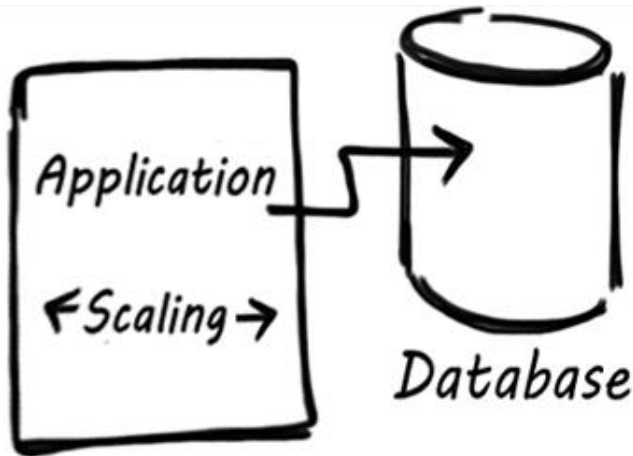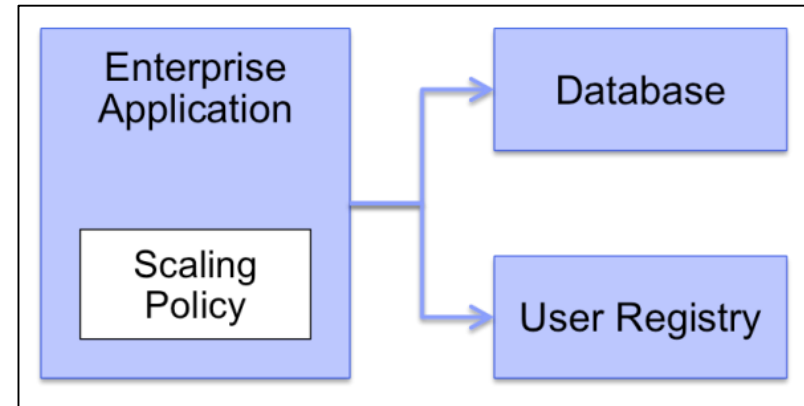- A pattern can be used as-is, extended, or created from scratch
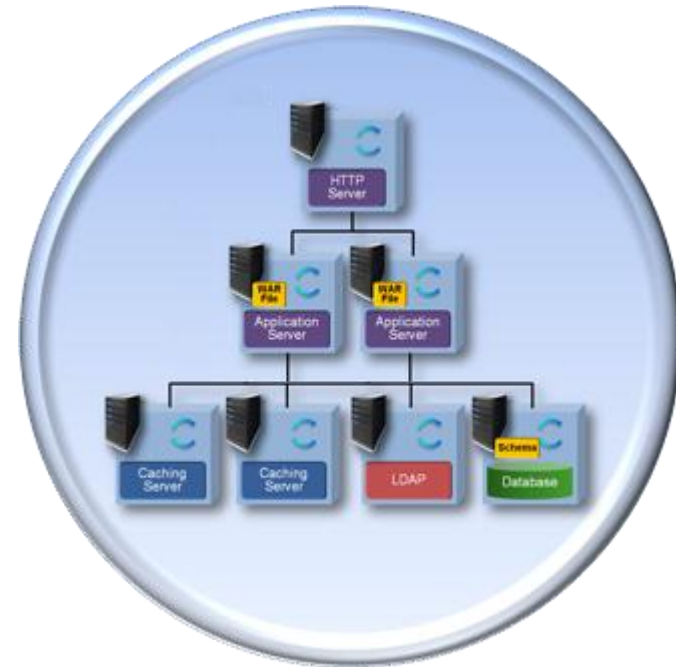
Benefits:
- ✓ **Agility**: faster time to value
- ✓ **Efficiency**: reduce costs and resources
- ✓ **Simplicity**: simpler skills requirements
- ✓ **Control**: lower risk and errors

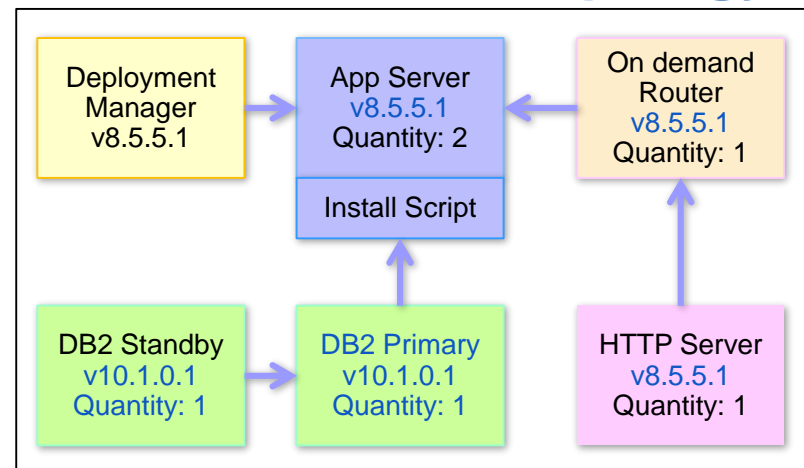# IBM PureApplication System supports flexible pattern options

What the business wants…

**Simpler deployment:
fewer skills needed**

Full control over topology

Simplifying the application deployment process with patterns

Client builds this…
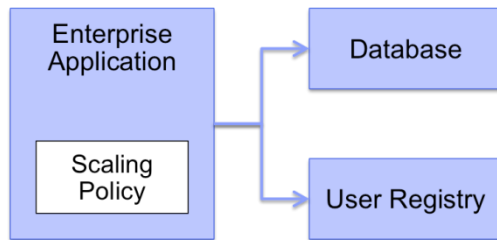
…PureApplication Manager constructs the topology…
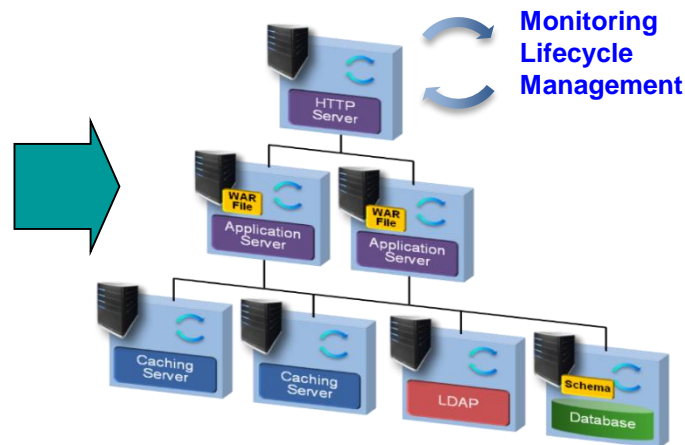
…then deploys and manages the solution automatically
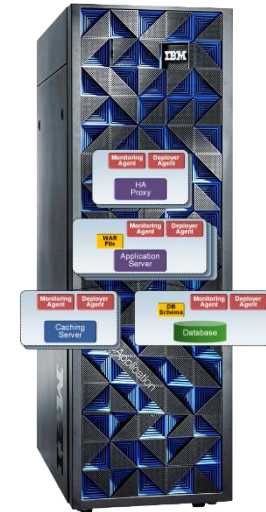
- Describes application via visual tooling
- Uploads application code (.war file), DDL
- Describes runtime behavior via pre-defined policies

- System generates appropriate topology (and corresponding virtual machines) based on client inputs

- Optimizes placement of individual virtual machines onto system hardware based on client inputs

IBM is the only vendor currently offering this capability

DEMO: Fast and easy Web application deployment using patterns

Deploy a Web application using a pattern to simplify creation

- Create a new pattern for TradeLite application and its database
- Deploy the pattern
- Examine running server components
- Show working TradeLite application
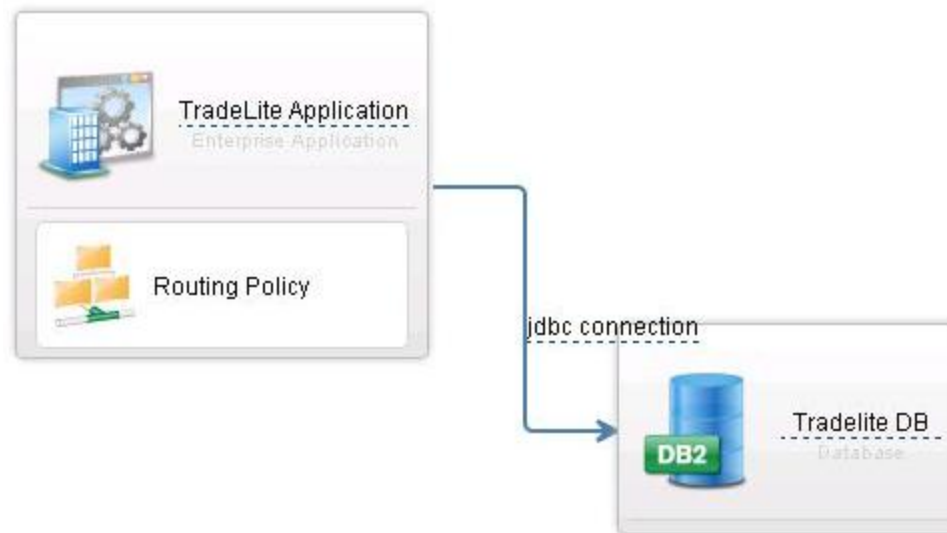
IBM Patterns include built-in workload management support

Full Function
Proxy service, Web cluster with failover, database, data grid, external connections

Load Balancing
Web requests are automatically load balanced across multiple virtual application servers

Monitoring
All components of virtual application environments are monitored by PureApplication System

Auto Scaling
Managed environments scale up and down based upon policies you specify

Resiliency
Failed virtual machines are replaced with new VMs which are configured with the old VM's identity

Security
ACL's for application sharing and management access; LDAP integration for application security

Monitoring Lifecycle Management

HTTP Server

WAR File — Application Server

WAR File — Application Server

Caching Server

Caching Server

LDAP

Schema — Database
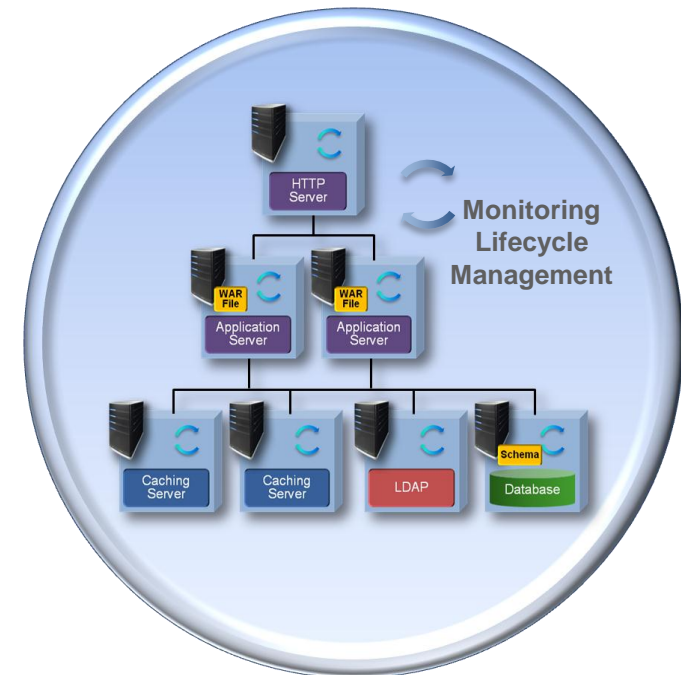
Use policies to manage service levels automatically

- Policies define service goals, such as:
  - Routing Policy
  - Log Policy
  - JVM Policy
  - Scaling Policy

- **Scaling policies** specify response time or CPU usage goals
  - Vertical Scaling adds **more processor capacity** as required
  - Horizontal Scaling creates **additional VM instances** as required, each with their own resources
  - Vertical and Horizontal Scaling are independent, but can be used together

Scaling Policy
Web/Enterprise Application

Enable session caching: ☐
Maximum Session Cache Grid Size:
UNCAPPED

Instance number range of scaling in/out:
1   50
Range: 1 - 2

Maximum vCPU count per virtual machine:
2   8
Value: 2

Maximum memory size per virtual machine (GB) :
4   16
Value:

☐ ▼ CPU Based

When CPU usage exceeds these thresholds (%):
10%   100%
Range: 10% - 100%

* and when thresholds are exceeded for the period (seconds):

then scaling by:
○ add vCPU only
○ add or remove nodes
○ add or remove nodes; add vCPU first and then add nodes

☐ ▸ Response Time Based
☐ ▸ Database Connection Based

Competitors cannot do this!

PureApplication Systems meet performance goals with **Vertical** auto-scaling policies

The administrator can define a scaling policy, specifying upper and lower limits of the acceptable range for **CPU usage.**

Scaling Policy
Web/Enterprise Application

☑ ▼ CPU Based

When CPU usage exceeds these thresholds (%):
10%
65%
Range: 10% - 100%

* and when thresholds are exceeded for the period (seconds):

then scaling by:
● add vCPU only
○ add or remove nodes
○ add or remove nodes; add vCPU first and then add nodes

☐ ▶ Response Time Based

☐ ▶ Database Connection Based

Unacceptable

Upper

Workload increases

Lower

Scaling Policy

ELB Proxy ELB Proxy

WAS Pattern

New vCPU

vCPU Pool

Shared Cache Shared Cache

1. Workload is operating within the acceptable CPU usage range

2. Workload increases; CPU usage exceeds the upper limit

3. PureApplication System adds vCPUs to support increased workload

Competitors cannot do this!

DEMO: Vertical auto-scaling responds to workload demand changes

- Administrator defines a scaling policy based on **CPU Usage**

- The JMeter test tool simulates increasing demand

- As demand increases, vCPUs are added automatically to keep CPU usage in the specified range

PureApplication System also supports **Horizontal** auto-scaling policies

- Administrator defines a policy for response time, specifying upper and lower limits of acceptable range

- PureApplication System automatically adds nodes as required to keep response time in the specified range

Scaling Policy
Web/Enterprise Application

☐ ▸ CPU Based

☑ ▾ Response Time Based

Add or remove nodes when Web response time exceeds these thresholds (ms):

0   10000

Range: 1000 - 5000

* and when thresholds are exceeded for the period (seconds):

120

☐ ▸ Database Connection Based

Lost Business

Max

Response Time Decreases
Increases

ELB Proxy   ELB Proxy

WAS Pattern

Intel Xeon processor

Shared Cache   Shared Cache

Scaling Policy

Elastic Load Balancing Proxy and Shared Cache are PureApplication Services

1. Workload is operating within the acceptable response time

2. Demand increases; workload exceeds the specified threshold

3. PureApplication System creates a new node to support increased demand

4. Demand decreases; workload falls below the specified threshold

5. PureApplication System deletes unneeded nodes

Competitors cannot do this!

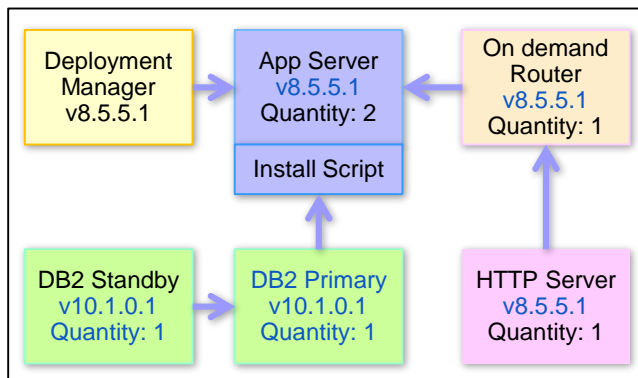I'd like greater control over my application topology when it gets deployed…

You can do this with IBM Patterns, too. Let's take a closer look…

Deployment Manager

IBM

Patterns also allow a custom topology for application deployment

Client builds this…

…then PureApplication Manager deploys the topology automatically
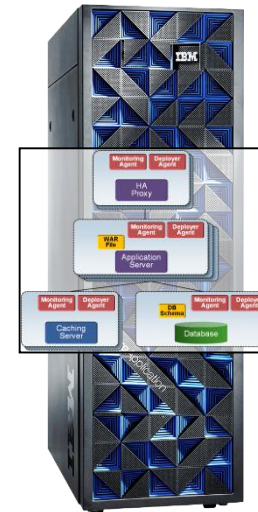
- Client builds out desired solution topology using pre-built patterns, or assembles one from pre-built components using built-in visual tooling

- Drag-and-drop pre-built or custom installation and configuration scripts onto individual components as appropriate

- Automatic optimization of Virtual Machines, placed onto compute resources based on pre-defined user or group profiles

Define multiple solution topologies for a single application

Example: Web Application with Database
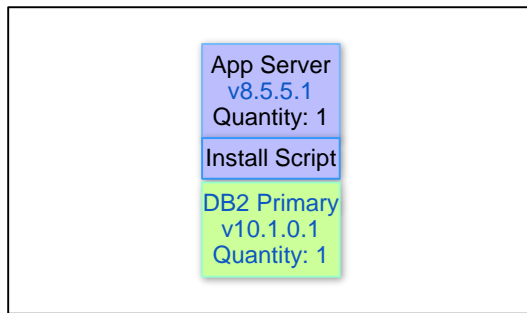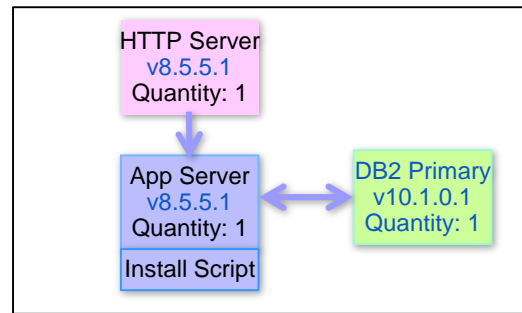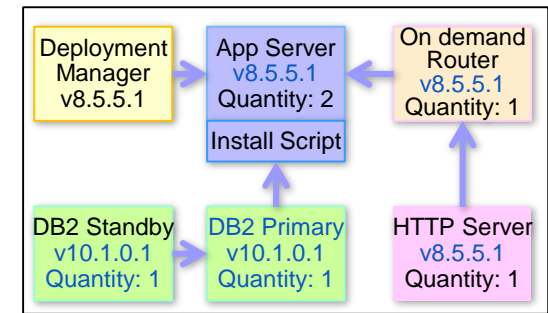

Development

- Single VM with application server and database server

Test

- Separate VMs for application server and database
- Add http server

Production

- Add on-demand router for distributing requests to appropriate node
- Add standby database node for failover

It's easy to deploy the optimal topology for each use case

DEMO: Create a pattern with a custom topology

- Demonstrate the creation of a pattern with custom-built topology

- Examine a complete pattern to see how middleware and scripts were added to it, and how it was configured

- See how to deploy the pattern to start it

- Examine the system display for running components

- See the application running

Can set any number of cluster members

Deployment manager
8.5.5.1

Cluster configuration

Install SOF Application

Custom nodes
8.5.5.1

JVM tuning

IBM HTTP servers
8.5.5.1

restartHTTPServer

DB2 Enterprise
10.1.0.1

Custom script

Pre-built script
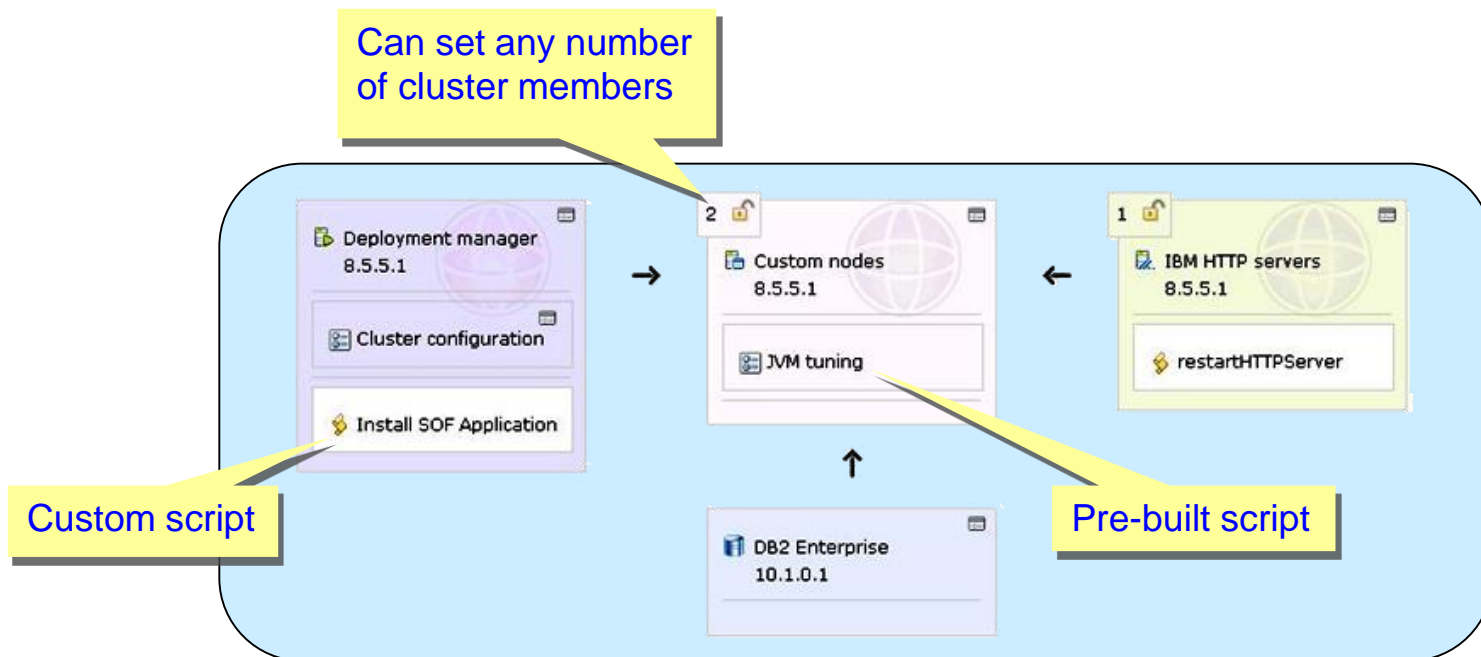
Focus on your application and let PureApplication System handle the rest

Private

Public

Beta[1]

PureApplication
System

Hybrid

PureApplication
Service on **SOFTLAYER**®
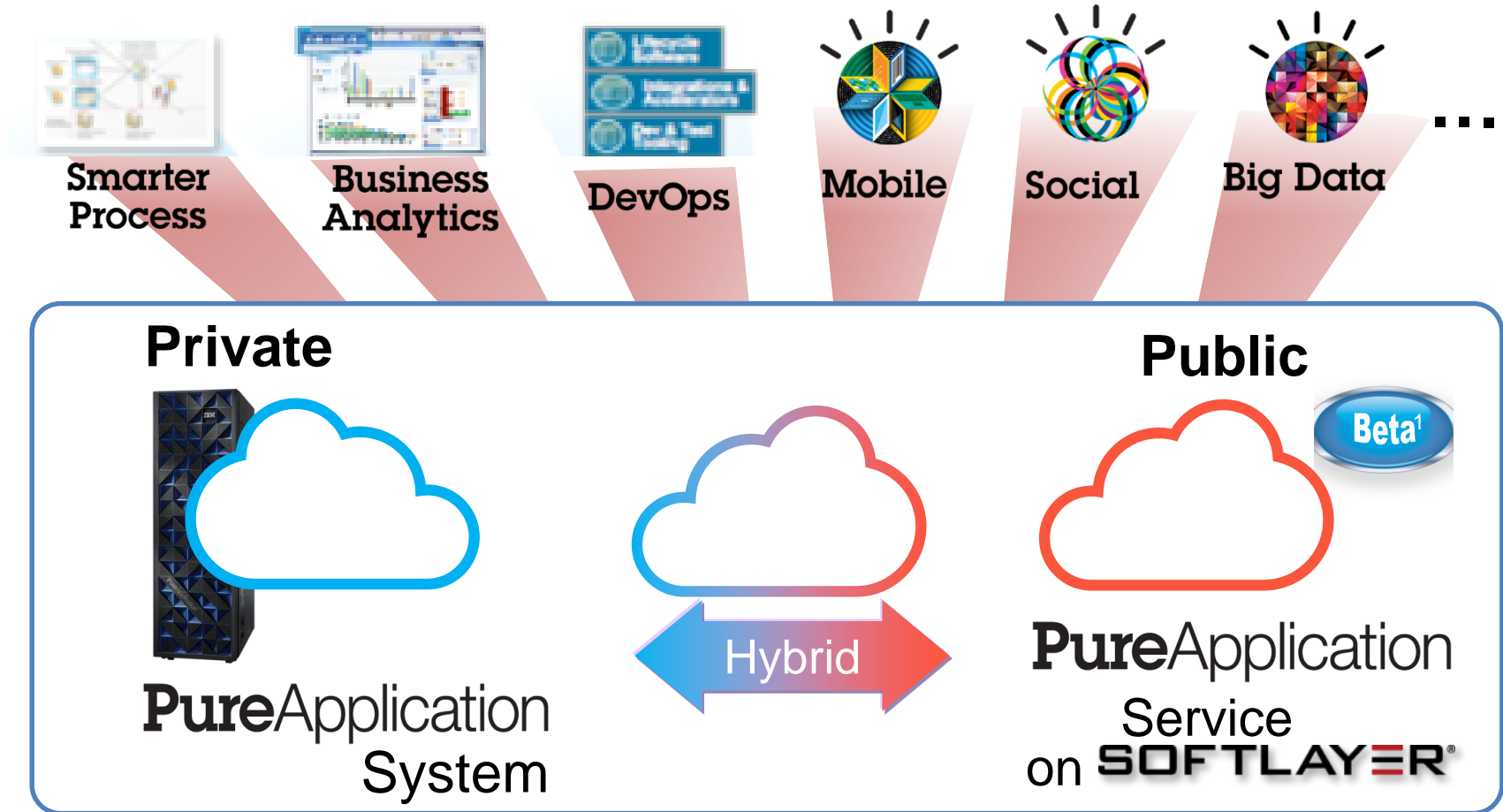
Simplicity, Speed, Lower TCO[2]

[1] PureApplication Service on SoftLayer Beta registration
[2] Based on IBM tests of PureApplication System vs. Do It Yourself

PureApplication Service on SoftLayer

Bringing cloud economics and hybrid cloud to the proven PureApplication platform
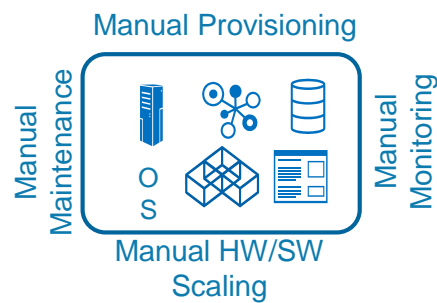
Manual

Deployment Monitoring, Scaling & Maintenance is manual

Manual Provisioning

Manual Maintenance

Manual Monitoring

O S

Manual HW/SW Scaling

Roll Your Own

Manual Provisioning

Manual Maintenance

Manual Monitoring

O S

Automated HW Scaling
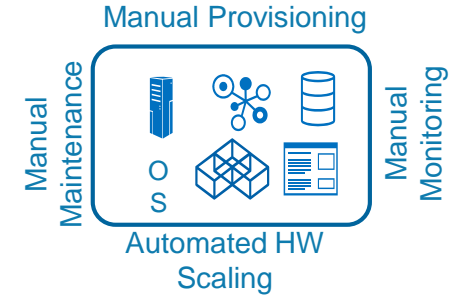
Public Cloud Roll Your Own

Automated

Simplicity, Speed & Lower TCO*

Smarter Process   Business Analytics   DevOps   Mobile   Social   Big Data   ...

Automated Pattern-based Deployment

Automated Maintenance

Automated Monitoring

O S

Automated HW/SW Scaling

Automated Pattern-based Deployment

Automated Maintenance

Automated Monitoring

Automated HW/SW Scaling

Hybrid
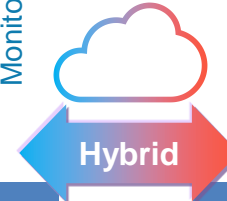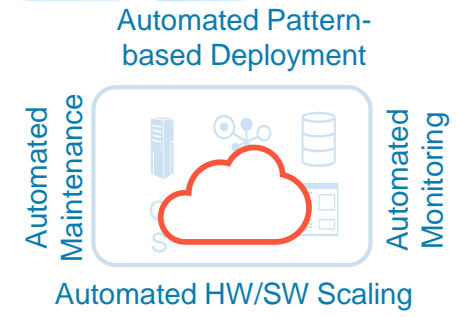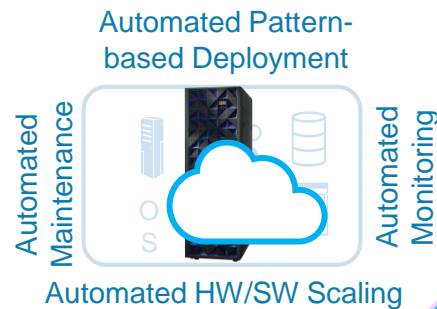
PureApplication System

PureApplication on SoftLayer

* Based on IBM tests of PureApplication System vs. Do It Yourself

19

© 2014 IBM Corporation

Software Patterns on SoftLayer
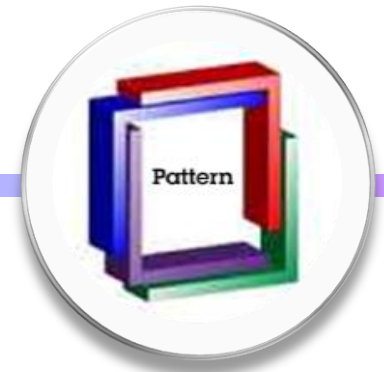
NEW

Defined Patterns Services

Beta

PureApplication
Service
on **SOFTLAYER**
an IBM Company

- 200+ application and middleware patterns available

- Pre-integrated environment optimized for applications

- Accelerates and simplifies running existing applications on the cloud

Totally unique, providing an extra deployment option based on your business decision points

Using private and public Cloud together strategically

Use Cases:

Private

Public

- SMBs growing to large enterprise
- Dev/Test moving to production
- LoB moving to Corporate IT
- Disaster Recovery as a service
- Offloading tier 2 workload
- Cloud Bursting

VCE Vblock lacks support for pattern-based deployments out of the box

Vblock is infrastructure, not a cloud application platform
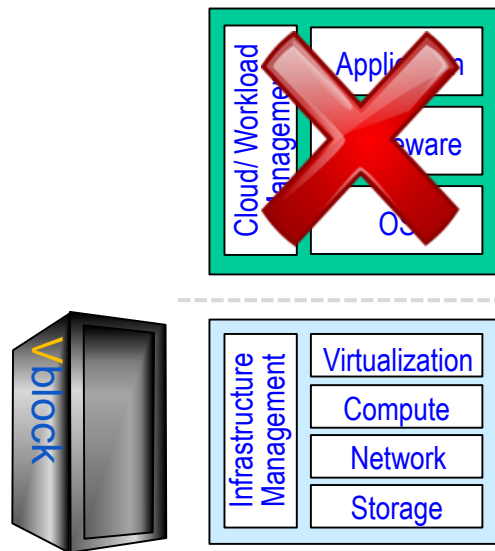
Customer must acquire, install, configure, integrate and maintain cloud application infrastructure separately

- Middleware
- Cloud management
- Workload management

Deployment options limited to core vCenter capabilities
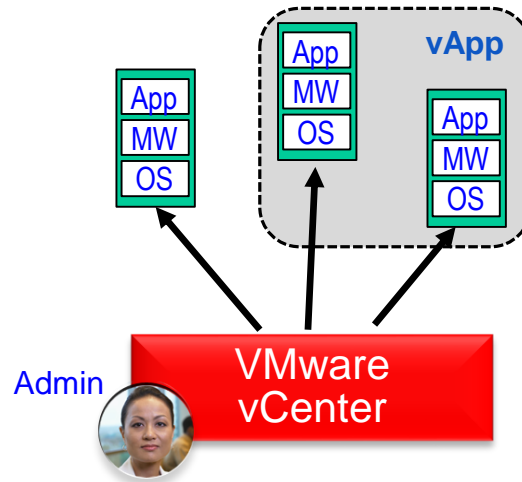
Create and deploy new or existing individual **VM templates,** not complete solution topologies

Logical grouping of related VMs into a vApp (simple metadata definition)

Pattern-like capabilities require expensive 3rd party add-ons

vCloud Application Director facilitates creation of application "Blueprints" via visual tooling

Building patterns with VMware vCloud Application Director requires heavy lifting

- Only supports creation of topology-based patterns ("Blueprints")
  - No pre-built Blueprints included

- No pre-built components available out of the box

- User must first create VMs for desired operating system

- User must have integration skills/knowledge to install and link components together
  - No built-in expertise provided

vCloud Application Director
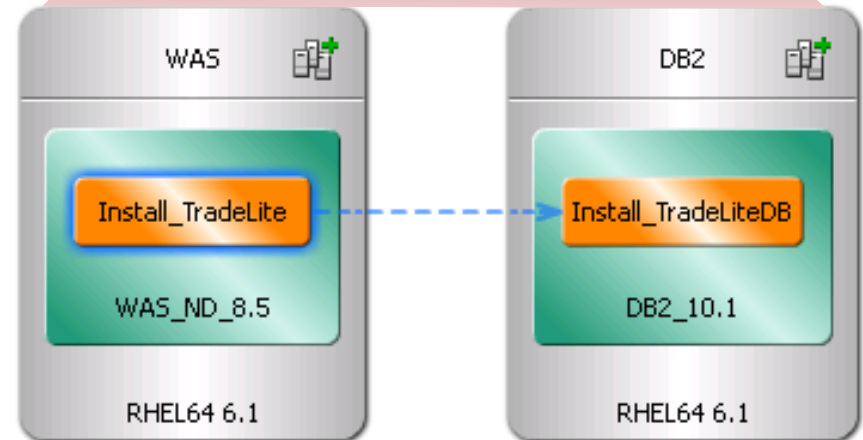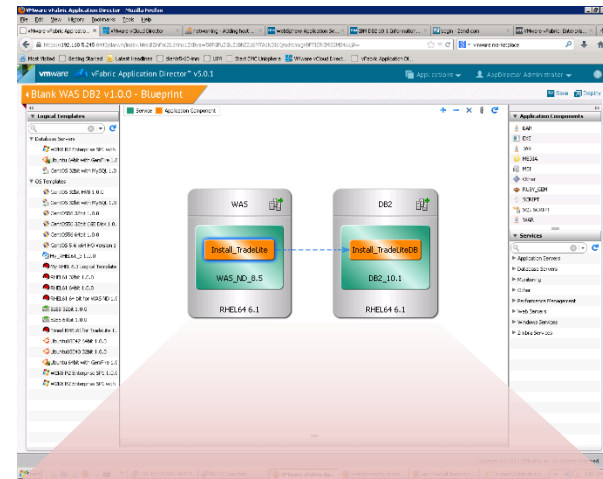
Leading IBM software capabilities have been optimized by capturing Patterns of Expertise

Over 200 PureApplication Patterns

Data Management

Business Analytics & Data Warehousing

Information Integration and Governance

Application Infrastructure

Business Process Management

Connectivity, Integration and SOA

Asset and Facilities Management

Social Collaboration

Mobile Development and Connectivity
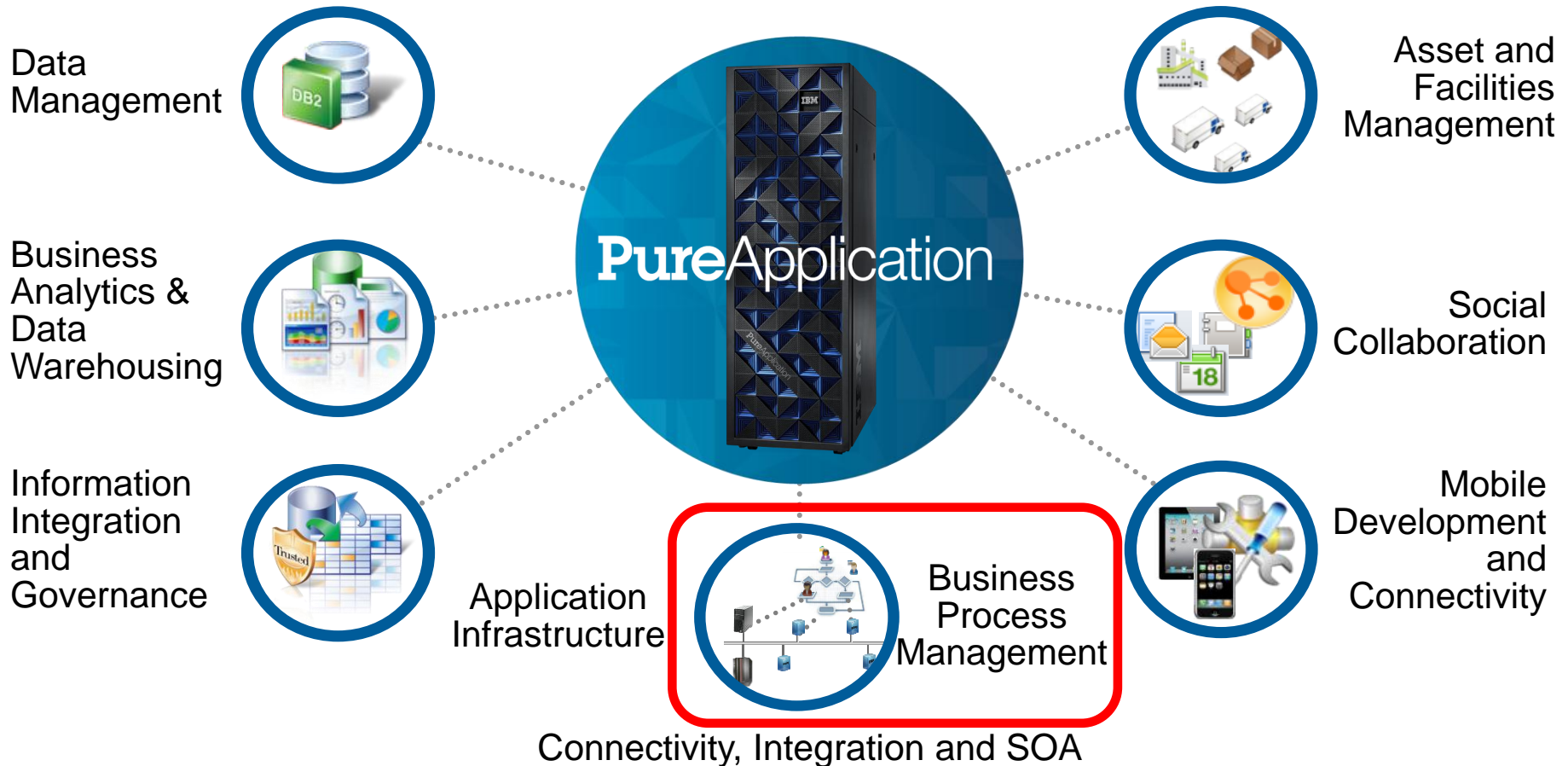
PureApplication

IBM BPM pattern simplifies installation and scalability in the Cloud
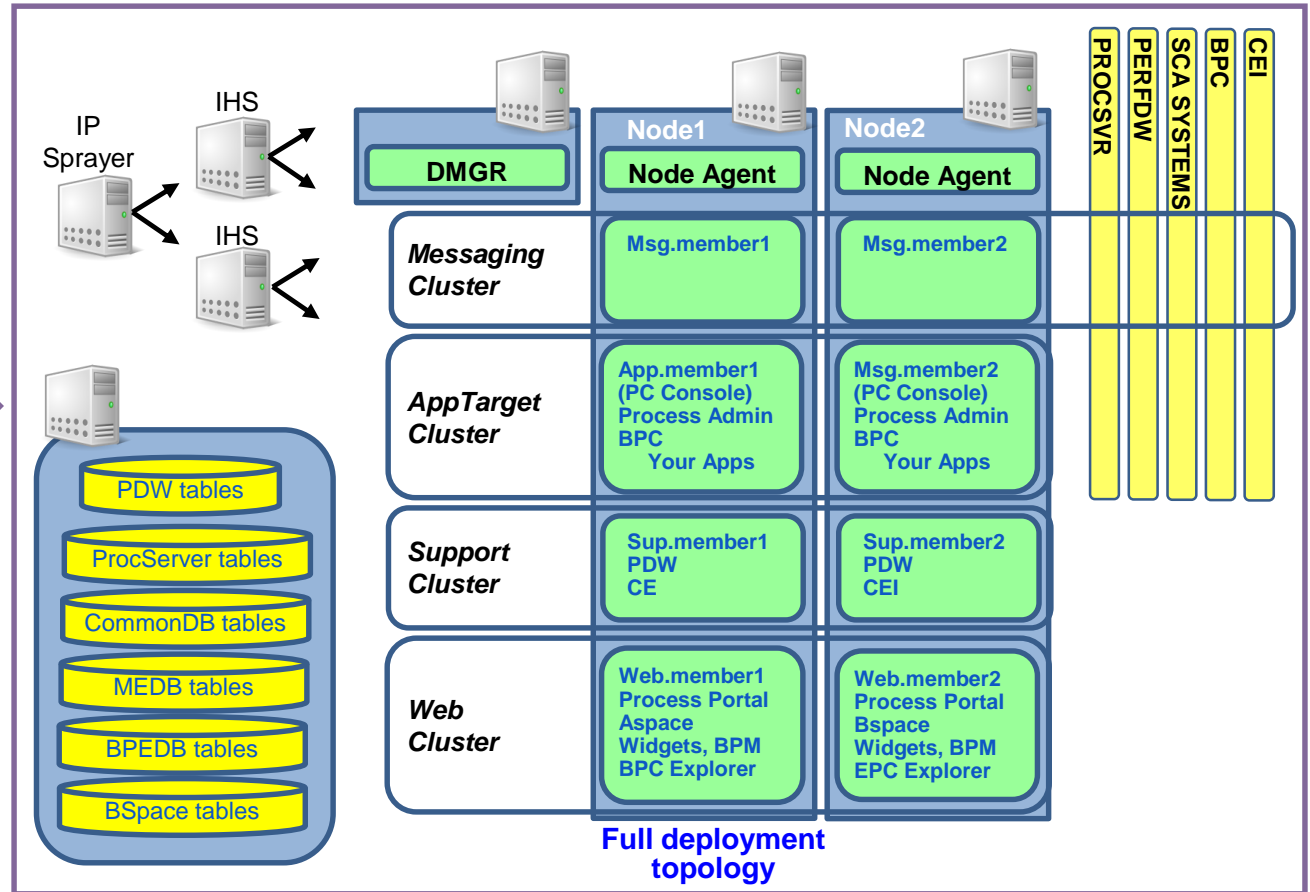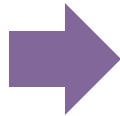
Simple configuration

Automatic, Enterprise-ready deployment

Leverage Patterns to develop and deploy mobile applications quickly

Data Management

Business Analytics & Data Warehousing

Information Integration and Governance

Application Infrastructure

PureApplication

Asset and Facilities Management

Social Collaboration

Mobile Development and Connectivity

Business Process Management

Connectivity, Integration and SOA

IBM Mobile Application Platform Pattern simplifies installation and scalability in the Cloud

Mobile Application Platform Pattern

Simple configuration

Incoming requests from DMZ

- Load Balancer
- Application
  - Worklight Server
  - Worklight Server
  - Worklight Server
  - Worklight Server
- Worklight Cluster
- Worklight Routing Policy
- Worklight Configuration
- Worklight Reports Database
- Worklight Runtime Database
- Other Backend Services
- Credit Card DB Adapter
- Credit Card Database

Automatic, Enterprise-ready deployment

DEMO: Deep integration between mobile app development and deployment

User

Mobile App

IBM PureApp Manager console

Select mobile pattern, upload app, deploy from PureApplication console

OR

Build an app; use Worklight Studio to build and deploy the mobile pattern and app onto PureApplication
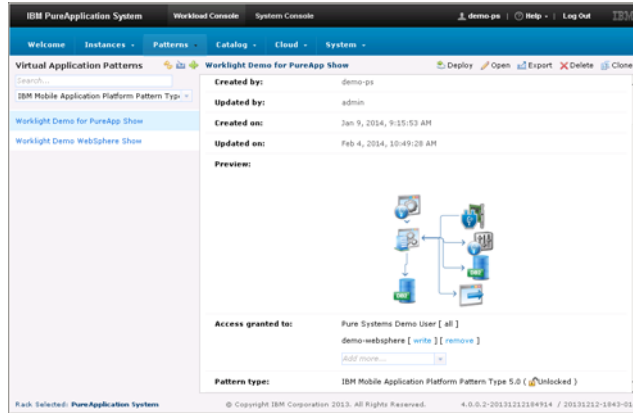
IBM Worklight Studio

Worklight Mobile Browser Simulator

Mobile Application Pattern speeds up deployment time by 9x while reducing risk

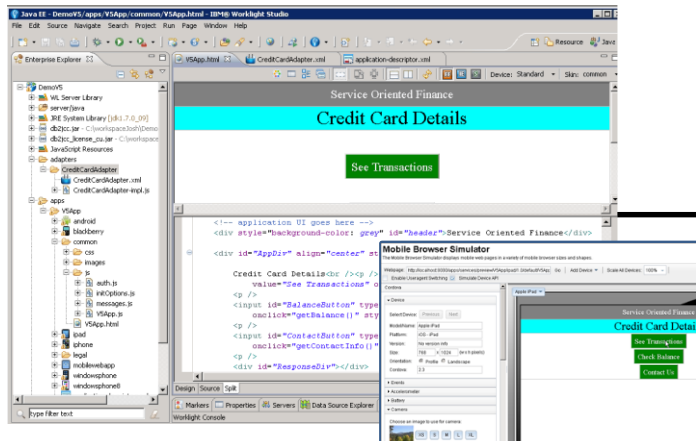Deploy a mobile app to an IBM Worklight high availability production environment

Topology diagram

- Load Balancer
- Deployment Manager
- Worklight Server
- Worklight Server
- Worklight DBs

Time to deploy mobile topology and app

203 min
For a skilled expert

Manual approach:
- System time: 108
- Labor (user) time: 95

9x faster deployment

Pattern approach:
- **21** min
- System time: 15
- Labor: 6

Time in minutes (axis: 0, 50, 100, 150, 200, 250)

- Labor (user) time
- System time
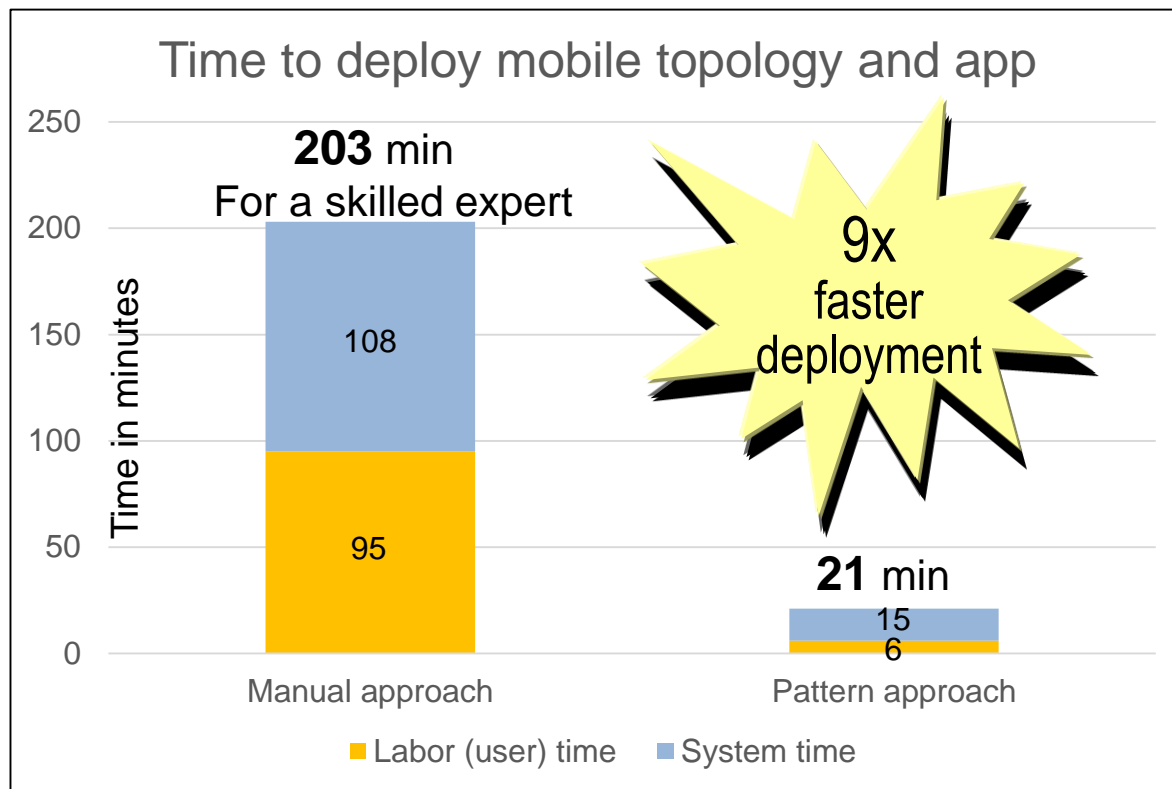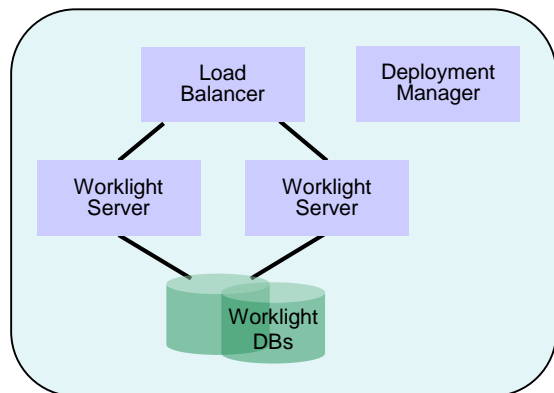
If you didn't have an expert, expect as much as 100x more time needed for manual approach
- Learning time adds significant labor time to the manual work effort
- Coordination between multiple people with deep application server, database, mobile and OS skills
- Testing efforts to ensure each step was done properly
- Risk of errors due to manual labor

Deployment Manager — "We manually deploy different application configurations for dev and test. This work is time-consuming and error prone."

Development Manager — "And delayed releases leave our development and test teams idle and unproductive."

IBM — "UrbanCode adds continuous deployment to PureApplication by automating configuration management. That reduces delivery time."
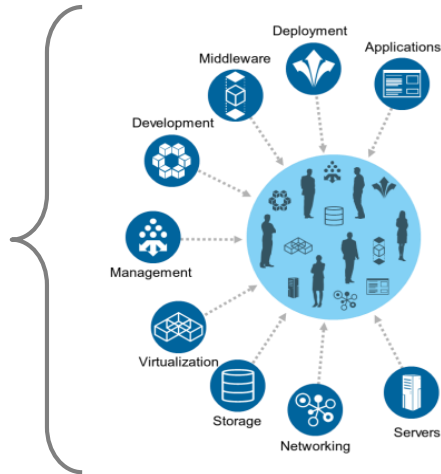
# DevOps for PureApplication System: Today's value proposition

- *PureApplication is a natural delivery vehicle for DevOps*
- *DevOps accelerates PureApplication time to value and increases ROI*

What PureApplication provides

- **Patterns-based, virtualized delivery model** ensures rapid deployment of environments with consistency and accuracy across SDLC phases

- **Expert, integrated system** with unified management, and maintenance of hardware, networking and software stack

- **Built-in monitoring** of workloads including load balancing and fault tolerance / disaster recovery
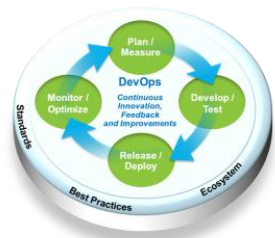
Value DevOps adds

Continuous Business Planning

Collaborative Development

Continuous Testing

Continuous Release and Deployment

Continuous Monitoring

Continuous Customer Feedback and Optimization

- **Automated Provisioning** of patterns-based Cloud environments on PureApp

- **Continuous Deployment** of application workloads on provisioned environments (UCD V6.0)

- **Continuous Testing** triggered right after deployment

- **Continuous Delivery** of applications into the hands of intended users (UCR V6.0)

IBM UrbanCode supports continuous deployment on IBM PureApplication System

Pull changes

SCM → Build Automation

Manage source code for apps under development

Publish builds

Artifact Library

Application | Resource Template

IBM UrbanCode Deploy

Execute provisioning with configuration settings
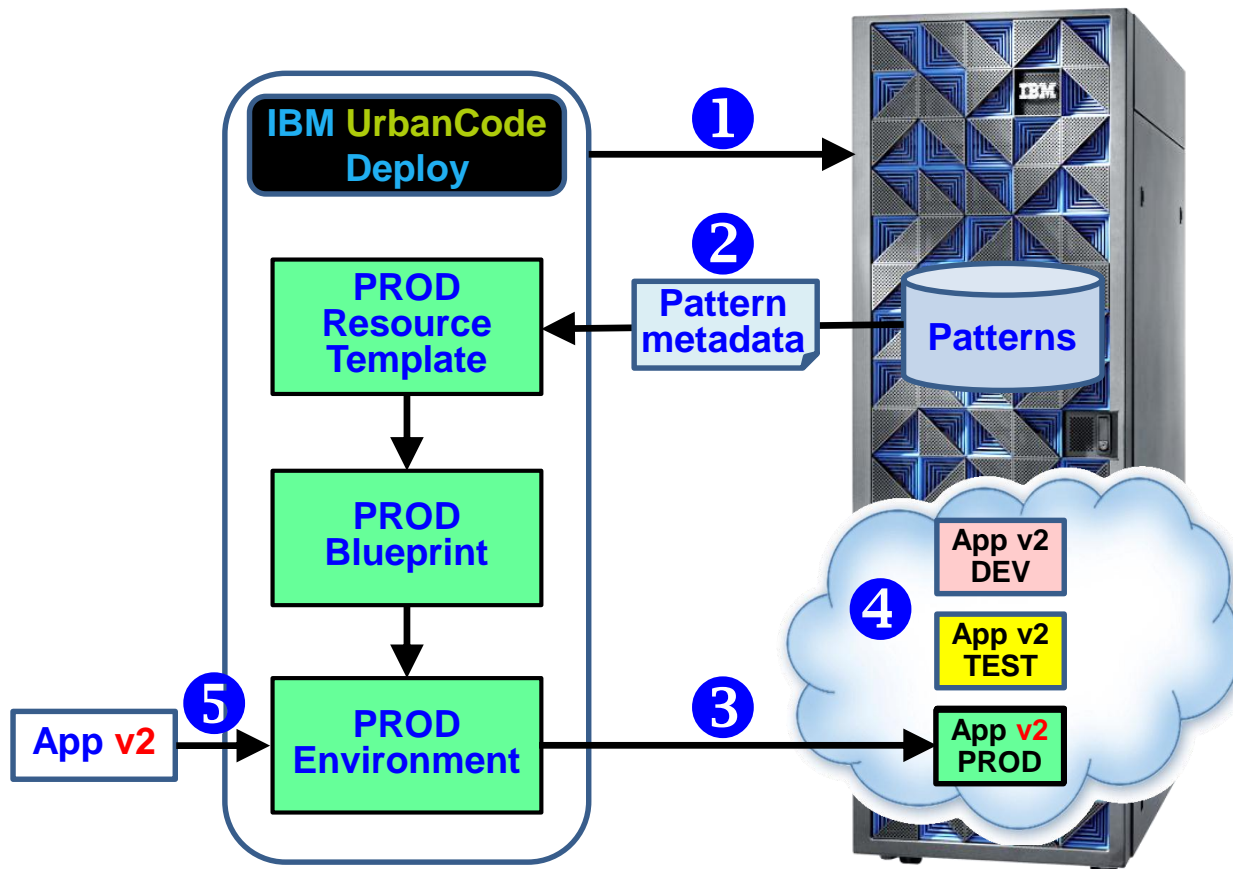
IBM PureApplication System

Execute application deployment and manage settings across environments

Provision infrastructure

○ *Application binaries (versioned)*

⬡ *Environment configurations (versioned)*

DEV | QA | PROD

- **Automate provisioning of environments as part of the end-to-end delivery process –** Establish and automate deployment of Application Blueprints with resource templates imported from Cloud patterns.
- **Deploy early and often to ensure high quality and faster releases using repeatable, reliable, and managed automation.**

37

UrbanCode Deploy integrated with PureApplication System makes DevOps easier

1. **Query** to find the pattern for PROD environment

2. UrbanCode Deploy **converts** pattern metadata to new environment for PROD

3. **Deploy** new, empty PROD environment to PureApplication System

4. Later, we have App v1 in production, and a new App v2 has been developed and tested

5. **Deploy** App v2 to PROD environment

IBM has more than the basics with 200+ pre-built patterns from IBM and our trusted partners!

Oracle does not have any pre-built assemblies available and they only have 5 Oracle apps only available as VM templates[1]

[1] Oracle VM templates for Exalogic

IBM provides patterns for popular third-party software

- Patterns automate system configuration at deploy time

- Uses "Bring Your Own License" and "Bring Your Own Binary" models for the products

- Patterns can be customized to meet the exact needs of the customer through configuration

- These patterns are service offerings from IBM with annual or multi-year subscription purchase options
  - Unlimited usage across any number of PureApplication Systems and all customer sites

RDS service offering pattern	Platform	Supported OS	Availability
Microsoft Dynamics (CRM), v2011	W1500 (Intel)	Win2k8 R2*	Now
Microsoft Exchange, v2013	W1500 (Intel)	Win2k8 R2*	Now
Microsoft SharePoint, v2010	W1500 (Intel)	Win2k8 R2*	Now
Microsoft SQL Server, v2008	W1500 (Intel)	Win2k8 R2*	Now
Oracle Database Enterprise Edition, v11g R2	W1500 (Intel)	RHEL v6.4	Now
Oracle Database Enterprise Edition, v11g R2	W1700 (Power)	AIX 7.1 TL2 SP2	Now
Oracle Weblogic, v11.0	W1500 (Intel)	RHEL v6.4	3/2014

* All editions of Windows 2008 are supported

ISVs are achieving dramatic productivity gains with IBM PureApplication System

Silvermoon Business Systems is already seeing performance results by reducing the typical deployment time of their application from two weeks to 18 minutes with PureApplication System.

OneTree Solutions optimized their PriceLenz solution on the IBM PureApplication System to increase performance & slash deployment time from 3 weeks to 8 minutes

The Innovation Group estimates a 96 percent reduction in deployment time, from 13 hours to 30 minutes, decreasing the company's internal costs.

QR Retail Automation created a Virtual System Pattern for their Silverlake Retail Merchandizing (PROFIT™) solution and typical deployment time dropped from 48 hours to 45 minutes.

PureApplication accelerates application deployment with Patterns of Expertise

✔ Fast and easy deployment of workloads using patterns of expertise

✔ Simple policy-based patterns include monitoring for lifecycle management

✔ Other patterns offer more control and flexibility of the deployable topology

✔ 200+ patterns available such as IBM BPM, Mobile, SAP, Oracle, Microsoft and many others, enable faster deployment and many choices for customers

✔ PureApp is ideal platform making DevOps easier