Enterprise Ready Hybrid Cloud

IBM South Bank - 23rd March 2015

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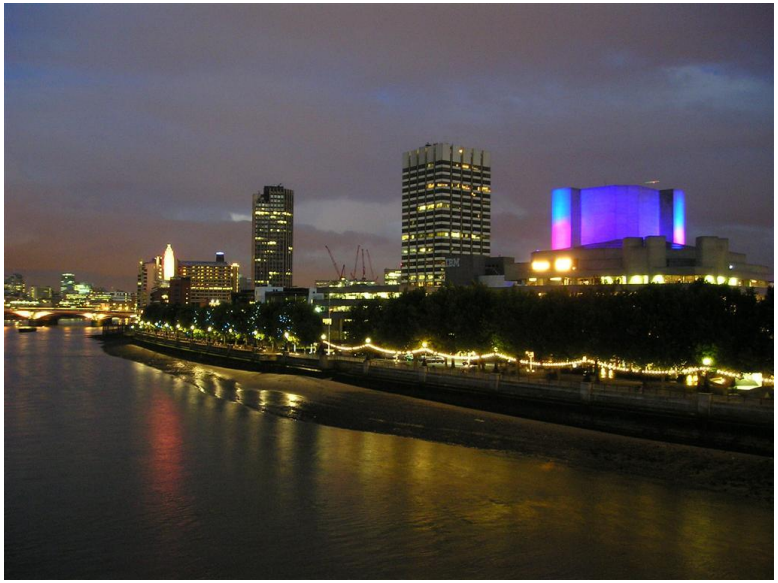
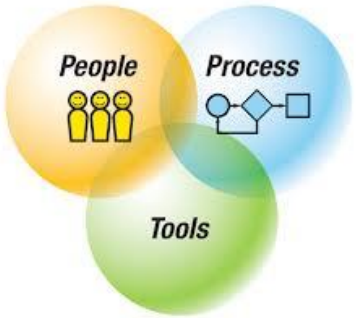


Why do people want to use Cloud in the First Place?

Vocabulary – Months to Minutes

Mindset– Heroics simply don't scale



Approach– Automate everything!

Some questions …

Where are you on your cloud journey?

What are your plans for PaaS rather than IaaS?

How will you run enterprise workloads in the cloud?

Do you have the resource to manage your infrastructure and enterprise workload on the cloud?

Have you experienced a production rollback or major outage with newly deployed workload?

Do you have a continuous delivery model?

How automated is the Ops in your DevOps?

How quickly can you deliver requirements to your business units?

Does IT enable competitive differentiation? Is it a commodity?

What is PureApplication?

Seamlessly deploy & move workloads between on & off-premises without change:
- **PureApplication System**
- **PureApplication Service**
- **PureApplication Software**

A **hybrid cloud** app platform

for easily deploying **applications and middleware**

with **enterprise grade qualities of service**

- Automated elasticity
- Multi-site deployment
- High availability & disaster recovery
- Monitoring
- License management
- Intelligent placement
- Centralized logging
- Security

Over 200 patterns including:

- Portal
- BPM
- Cognos
- DataPower
- Mobile
- WAS
- DB2
- Oracle
- MQ
- IIB

+ any Red Hat/AIX/Windows software

PureApplication

A hybrid cloud application platform for cloud enabling applications and middleware with enterprise grade qualities of service

heat

docker NEW

CHEF

On a Pre-Integrated System

POWER or x86

PureApplication System

On-Premises

On SoftLayer

Available in SoftLayer data centers worldwide

PureApplication Service

Off-Premises

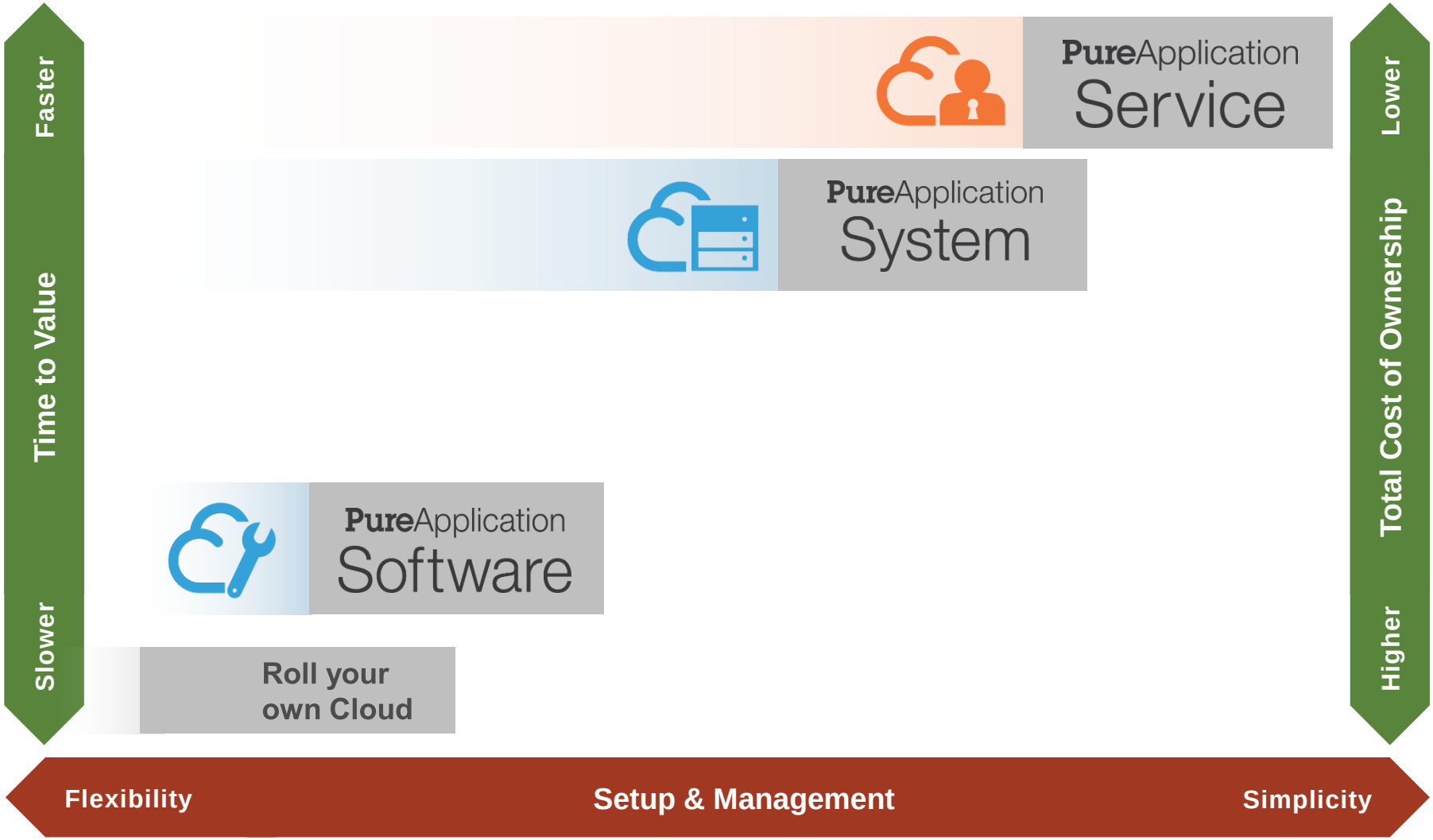
On Your Own Infrastructure

Bring your own hardware

PureApplication Software

On-Premises NEW

Deployment options



Application Portability and a Cloud-ready Platform

Automate the complexity of deploying and managing applications in the cloud

AXA Belgium: Underwriting Innovation in the Cloud

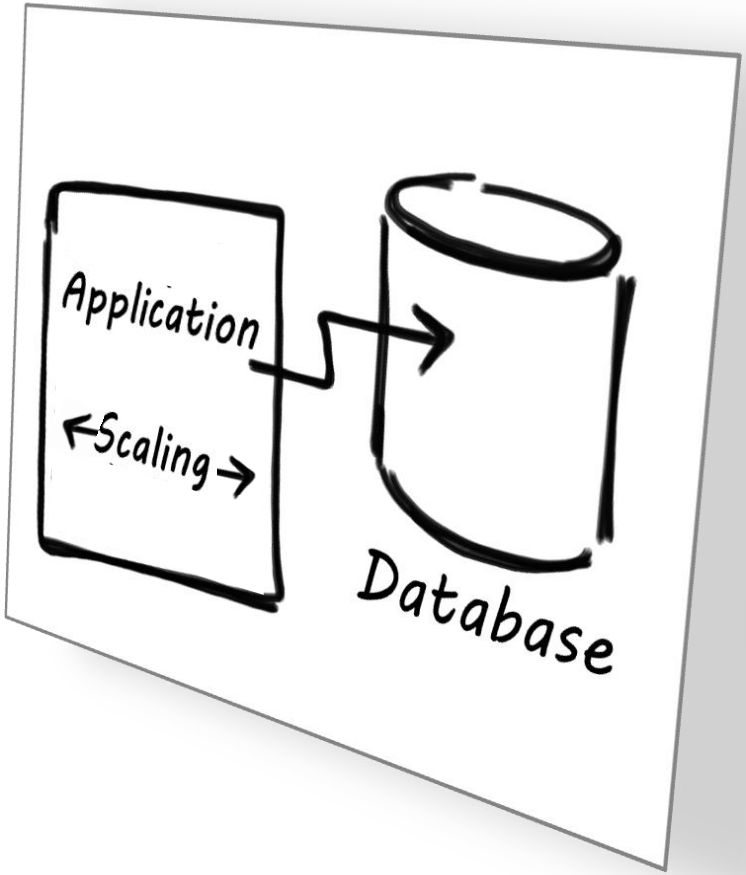
- Business Challenge:
  - AXA Belgium needed to take it's life Insurance underwriting application to the Cloud
- Business Solution
  - AXA deployed IBM PureApplication Service on SoftLayer (PaaS) and patterns for Operational Decision Manager (ODM) software
- Smarter Insurance
  - AXA uses ODM to create and maintain complete sets of insurance rules
  - **Abilility to promote rule changes in PRD every week instead of 4 times a year**

Solution Components:

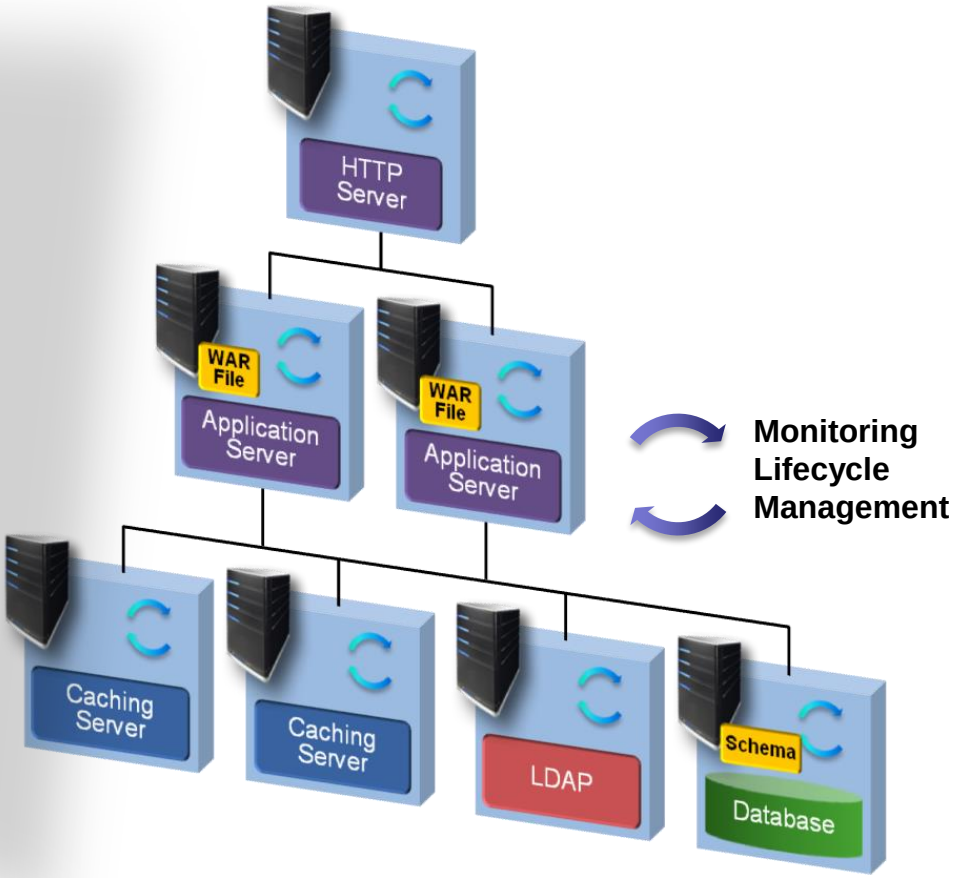
- IBM ODM 8.5.1
- IBM ODM Virtual Application Pattern
- Pure Application Service on SoftLayer

What are patterns?

What the business wants…



What's required…

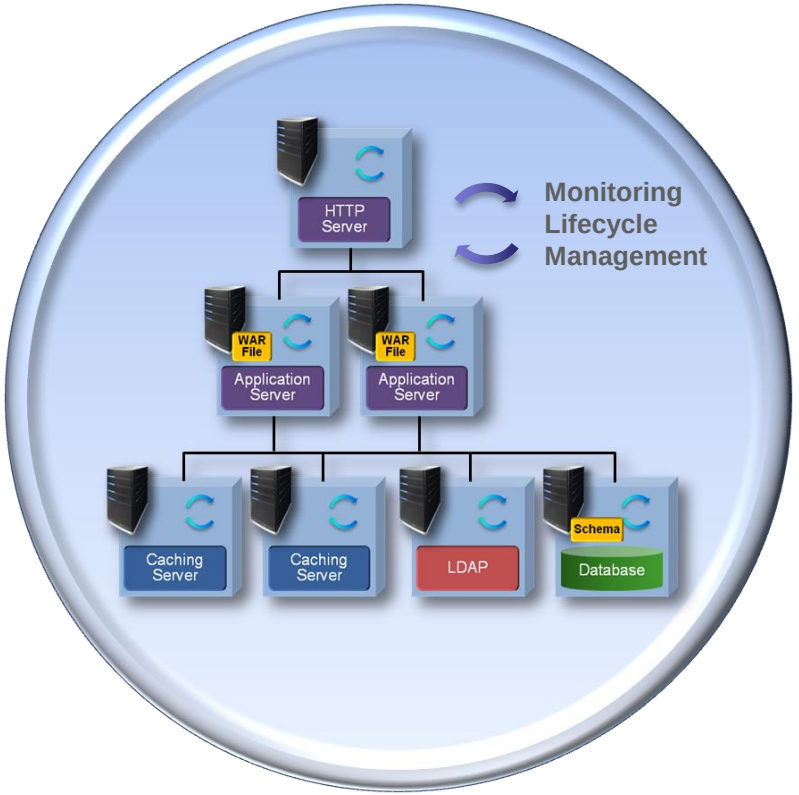


Patterns of Expertise: Proven best practices and expertise for complex tasks learned from decades of client and partner engagements that are captured, lab tested and optimized *into a deployable form*

What is a Pattern?

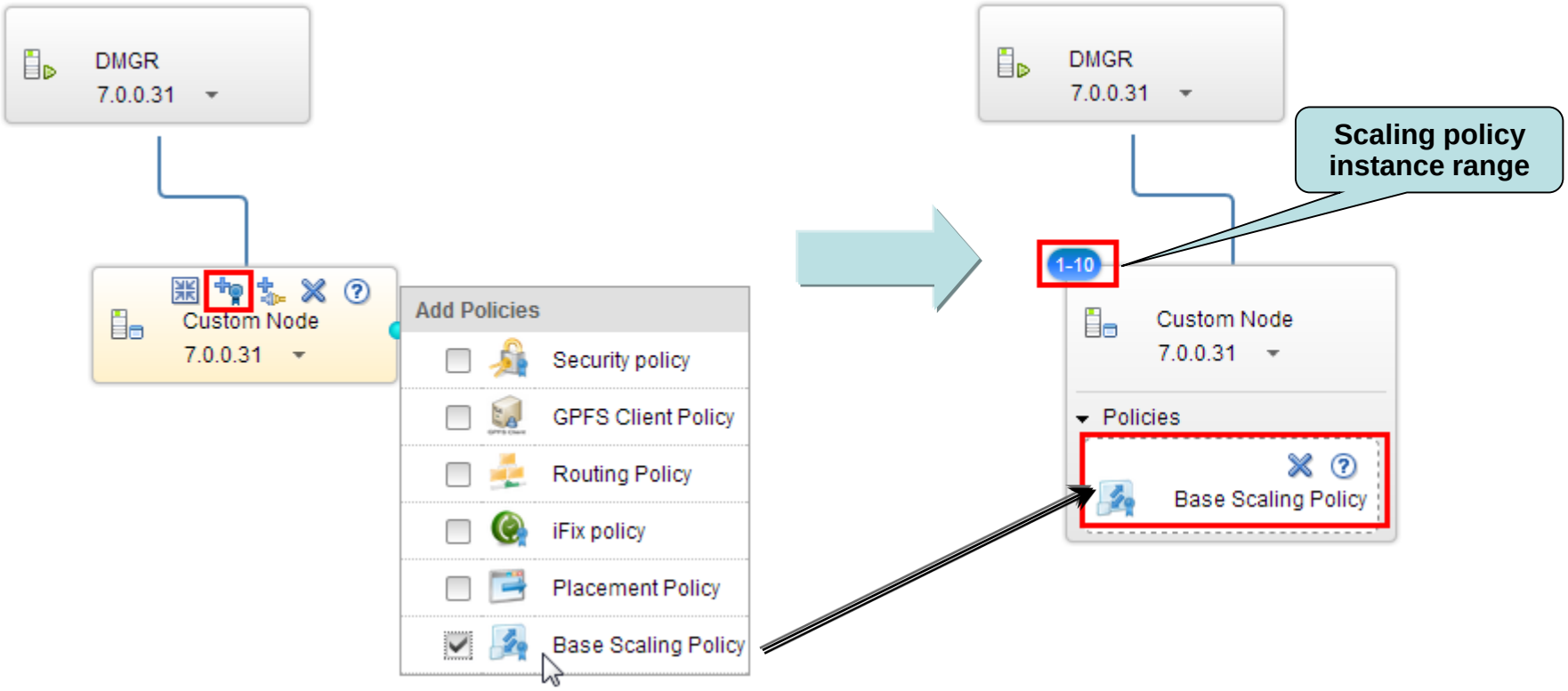
The pre-defined architecture of an application:

- For each component of the application (i.e. database, web server, etc)
  - Pre-installation on an operating system
  - Pre-integration across components
  - Pre-configured & tuned
  - Pre-configured Monitoring
  - Pre-configured Security
  - Lifecycle Management
- In a deployable form, resulting in repeatable deployment with full lifecycle management
- Delivering superior results:
  - Agility: Faster time-to-value
  - Efficiency: Reduced costs and resources
  - Simplicity: Simpler skills requirements
  - Control: Lower risk and errors



VSP Builder – Policy Sources

- Several policies are now available for VSPs in pop-up lists on the component



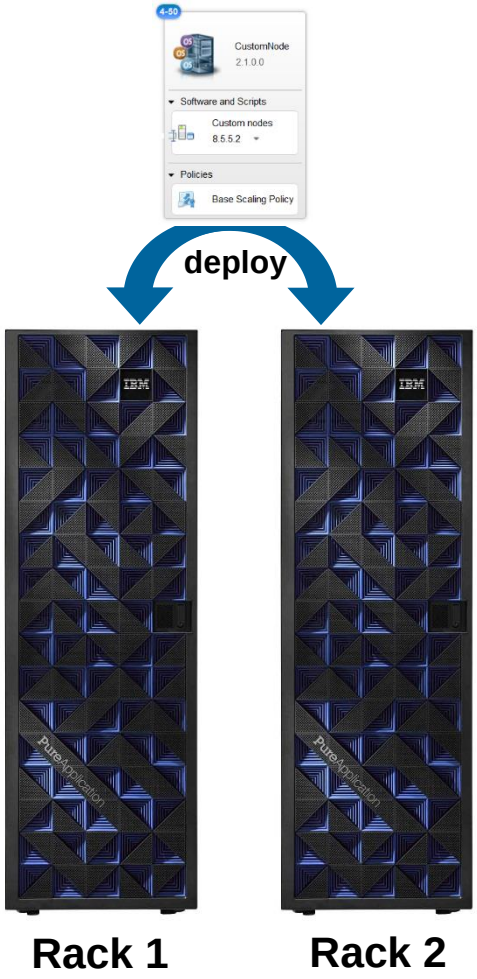
On a Pre-Integrated System

POWER or x86

PureApplication System

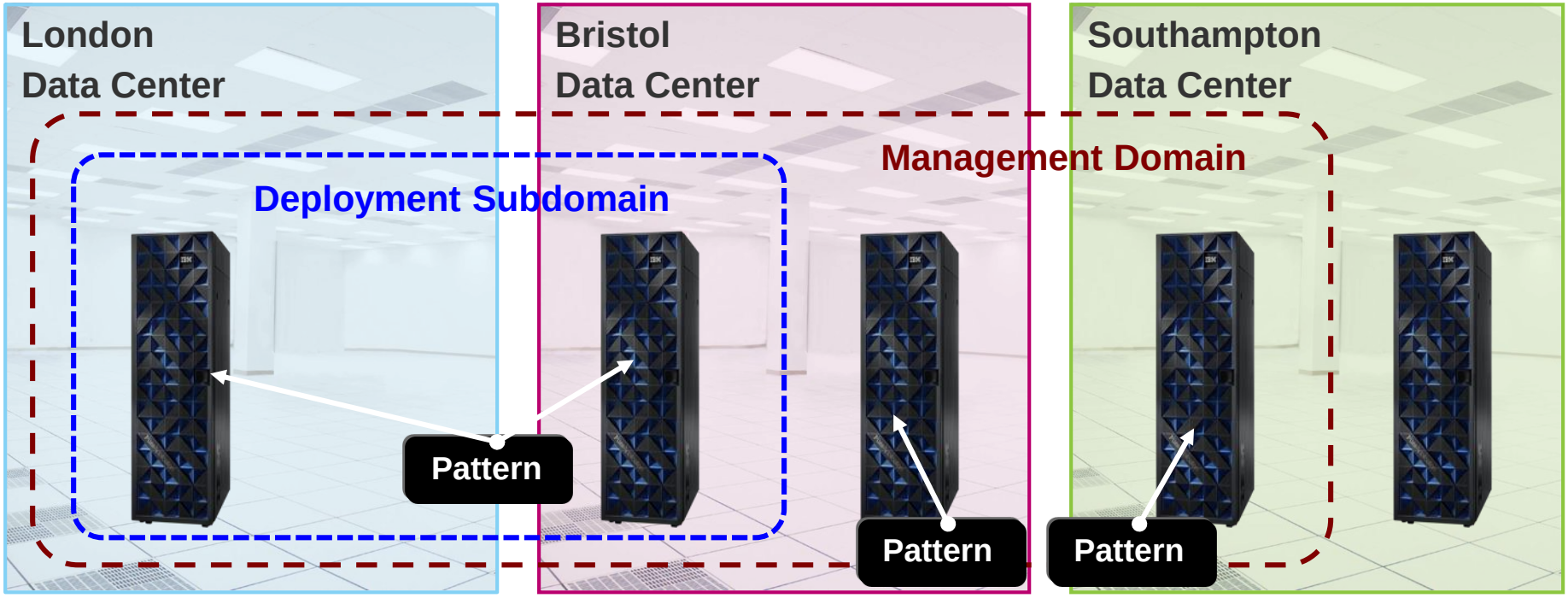
On-Premises

Achieve **high availability** for key applications by deploying **across multiple systems**



1. Build a pattern on any rack
2. Deploy the pattern across the racks, choosing where each image within the pattern should run
3. Consolidated view of pattern artifacts across the racks
4. A single view to monitor the status of the deployed pattern across the racks
5. Greater cost efficiency through finer grained replication on a workload by workload basis

PureApplication System multi-target deployment:
Management domains & deployment subdomains



Systems in a Management Domain can share catalog content through a single console.

Racks within a domain can span any distance.

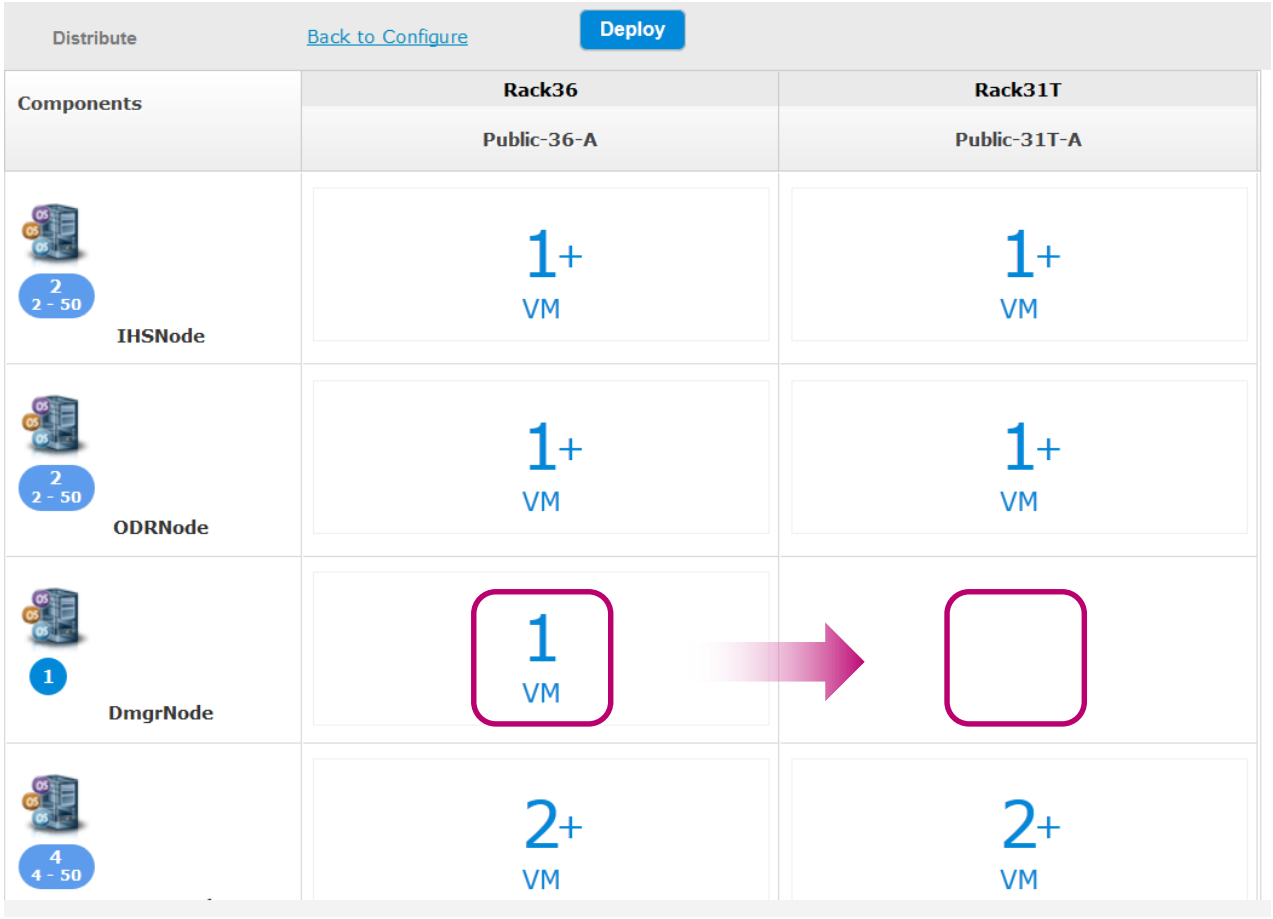
Systems within a domain can be grouped into Deployment Subdomains. A pattern can be deployed across multiple racks within a subdomain.

Subdomains assume a low latency connection between the systems.

A rack can also be standalone and not belong to any domain or subdomain.

Deploying across multiple systems in a subdomain

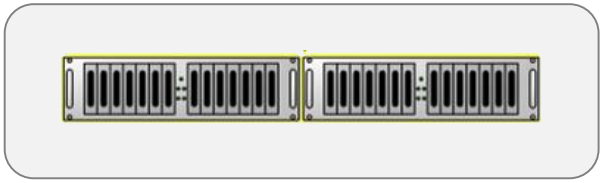
Drag and drop virtual machine instances to place them across cloud groups and systems



External storage support via fiber channel

IBM SAN Volume Controller (SVC)

Fiber Channel



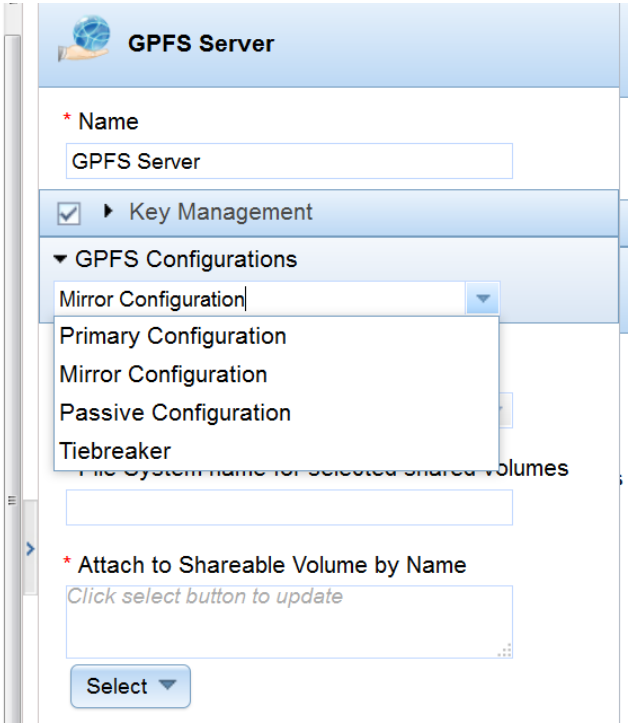
Existing external SAN

- **Leverage pre-existing storage infrastructure – EMC, HP, IBM, etc.**
- **High performance storage (> 1 Million IOPs)**
- **Expandable storage (> 2 Petabytes)**
- **Works with all Gen1 and Gen2 racks**
  - **Gen 1 racks require external mounting of SVC**
  - **Gen 2 racks will allow certain SVC models to be mounted within the rack**
- **PureApp External Storage Enablement Feature code**
  - **Includes on-site integration of external SVC into a PAS rack**
  - **On-going support for External Storage**
- **Block Storage only – No deployment instances or catalog content**
  - **Attach/detach only. All other operations managed externally by storage admin**

Leverage highly available shared storage with GPFS

GPFS server

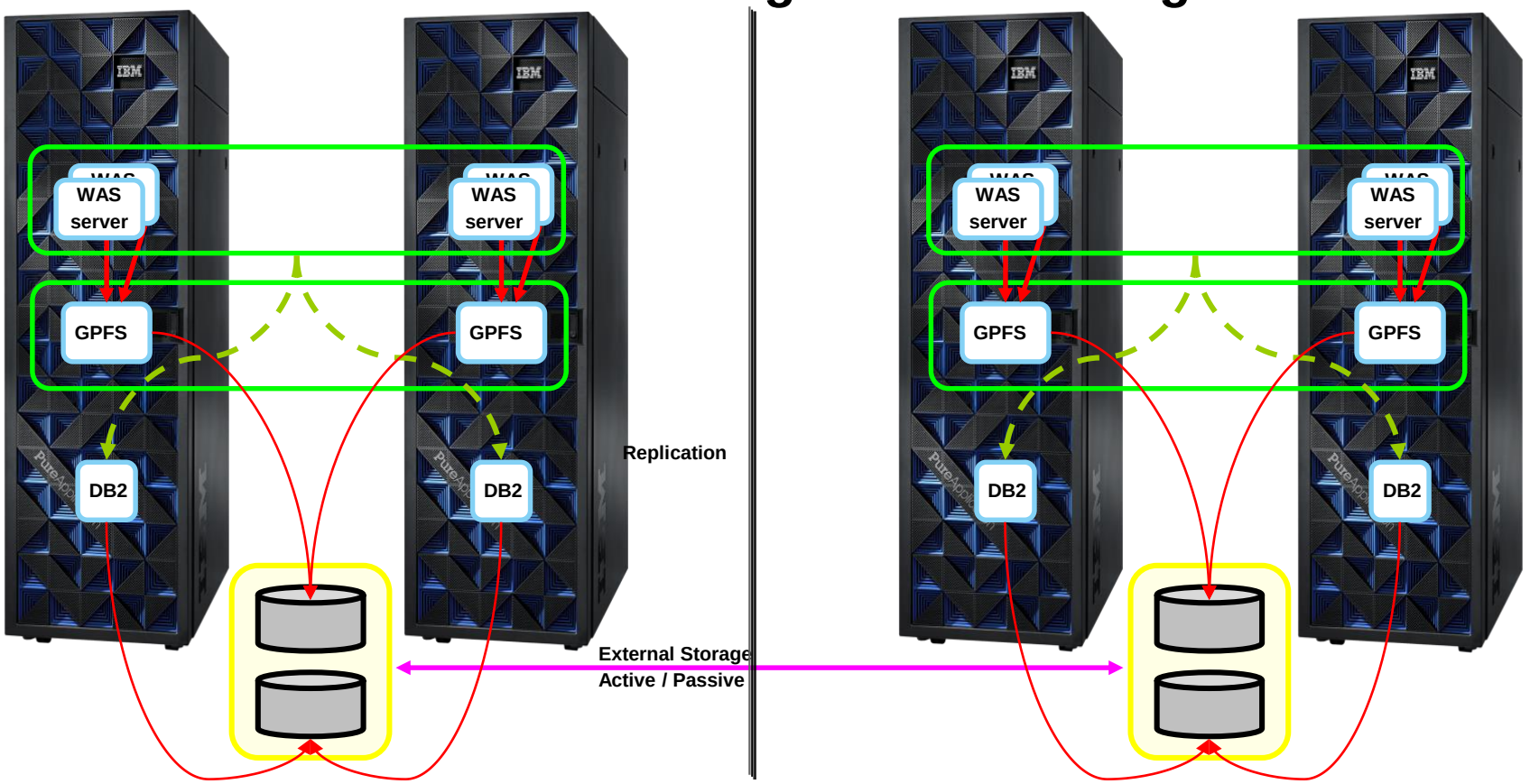
- **Single virtual application**
- **Administrator:**
  - **Creates storage**
  - **Chooses the configuration**
  - **Deploys the pattern**
- **Maintenance and management operations provided by the pattern**



GPFS shared service used to connect to the GPFS server

- **Simplifies client connection**

Sample Topology: WAS/BPM w/DB2 – Active within same DC and passive across another D.C. using external storage



- Split WAS cell across rack in DC-1
- Same cell replicated in DC2 – must have same host name for transaction recovery
- GPFS used for WAS tran logs
- Consistency group around Tran log and Database BS

Docker and Patterns: Better Together

Enterprise Strength Docker

1. Build, deploy and run Patterns with Docker containers on PureApplication System, Service and Software
2. PureApplication brings Enterprise-grade lifecycle management to Docker
3. Included private Docker registry Pattern deployable as a shared service

Improved Performance

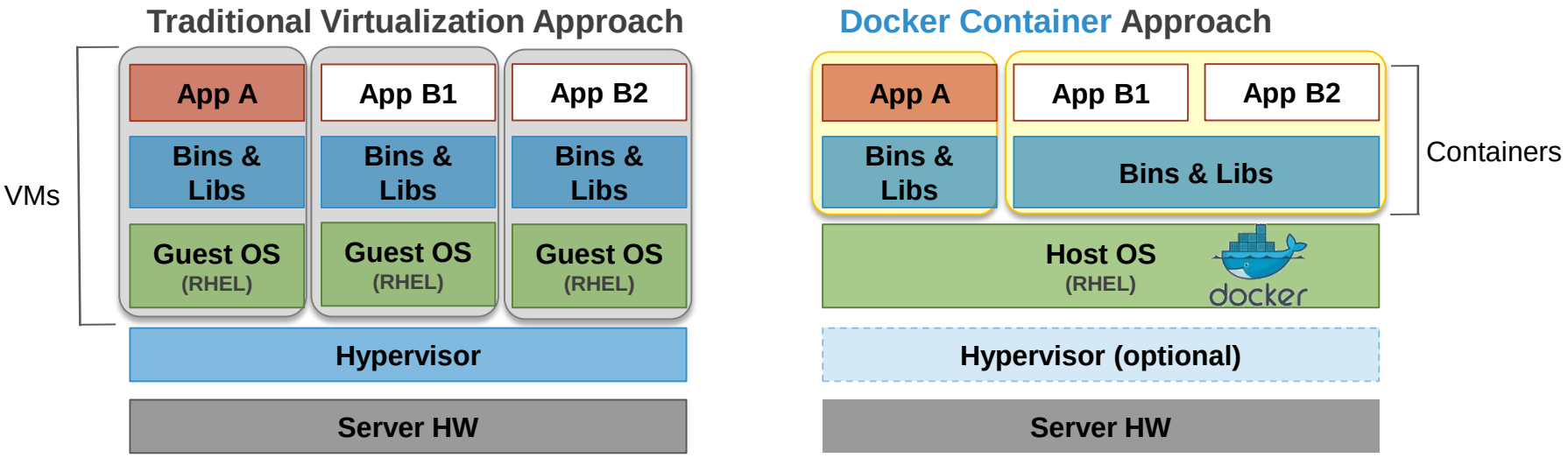
- Faster application deployment, start-up and scaling ← **92% faster vs. VM deploy**
- Higher density deployments ← **7.8X more containers vs. VMs on same HW**
- Vmware provides capabilities currently lacking in Docker (e.g. vMotion)

Portability, Hybrid Cloud, Open ecosystem, Productivity

- More seamless workload movement in hybrid & borderless cloud scenarios
- Access thousands of pre-built applications on DockerHub

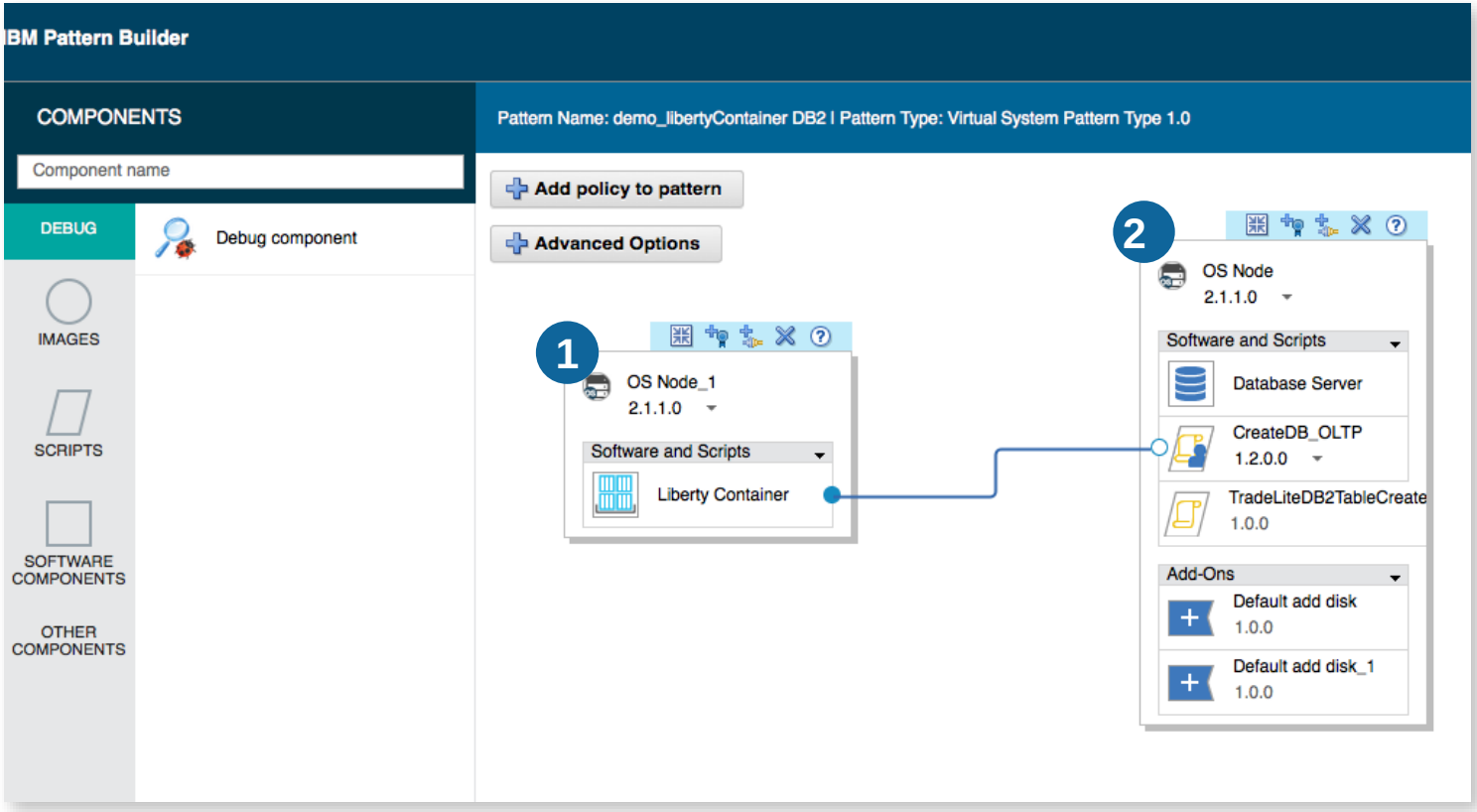
What is a Docker Container?

- A lightweight isolated user space within a running Linux OS
- Containers share Host OS kernel services
- Implemented with Linux cgroups, saved as a file system



Attribute	VM	Container
Start-up time & Performance	Slow (minutes) HV overhead	Fast (seconds) no HV overhead
Footprint	Large (nothing shared)	Small (OS kernel shared)
Resource Constraints	Yes	Yes (CPU, Memory)
Isolation & Security	High	High

Docker & Patterns Example: Liberty Container and DB2 Pattern



Scenario:

1. **Compute node w/ Docker container, containing Liberty, connected to...**
2. **Compute node w/ DB2 Pattern, and several script packages**

Value:

Docker content gets access to PureApp's enterprise-grade lifecycle

Patterns gain ability to run 40,000+ dockerized apps

Integrate with emerging open standards

openstack™ CLOUD SOFTWARE

heat

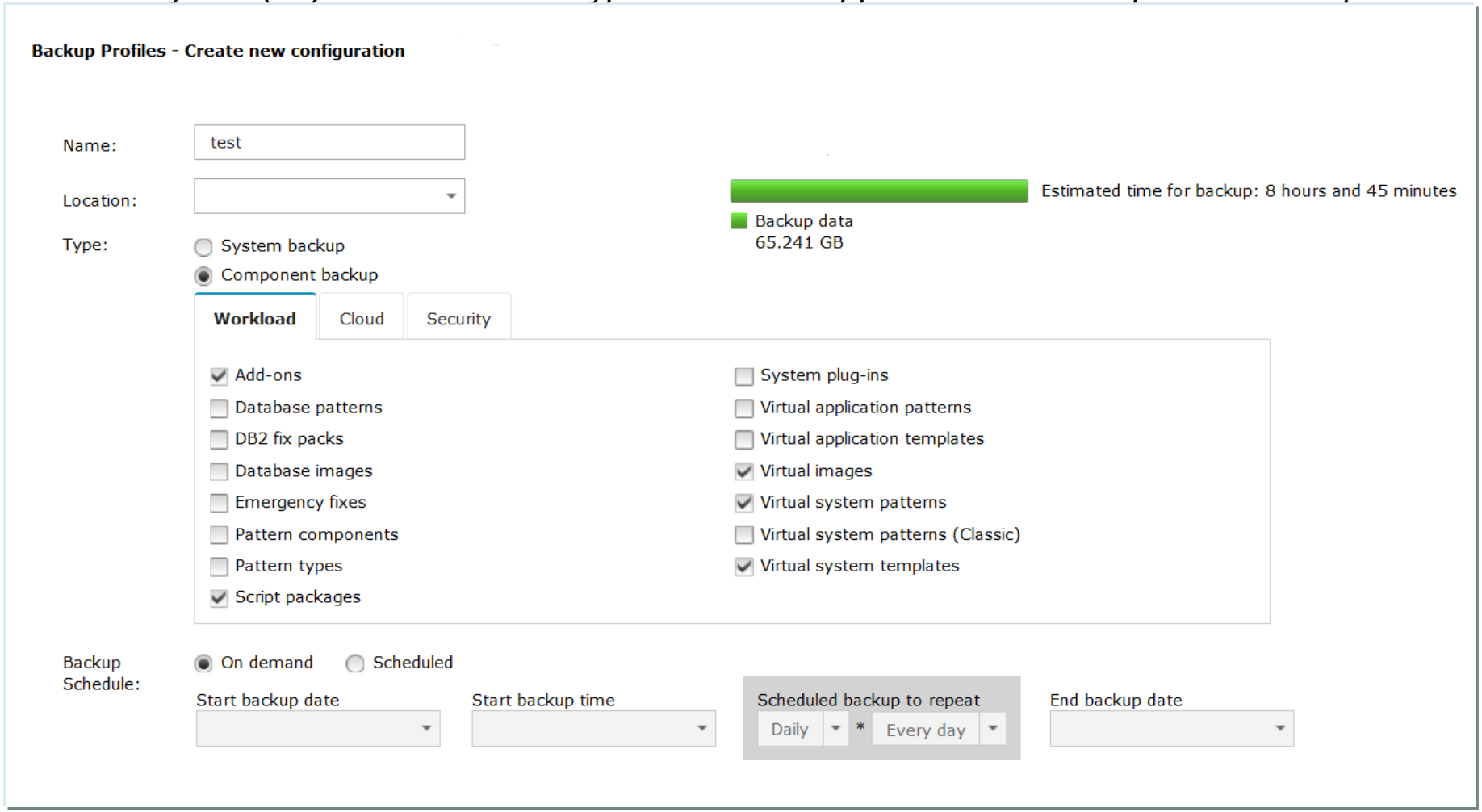
CHEF™

- **Consume and deploy Heat content in PureApplication System**

- **Integrating the pattern engine and Chef**
- **Define, provision, configure application resources with Chef**
- **Reuse Chef assets in patterns**
- **See how -> https://www.youtube.com/watch?v=1xeAkDxBxXY**

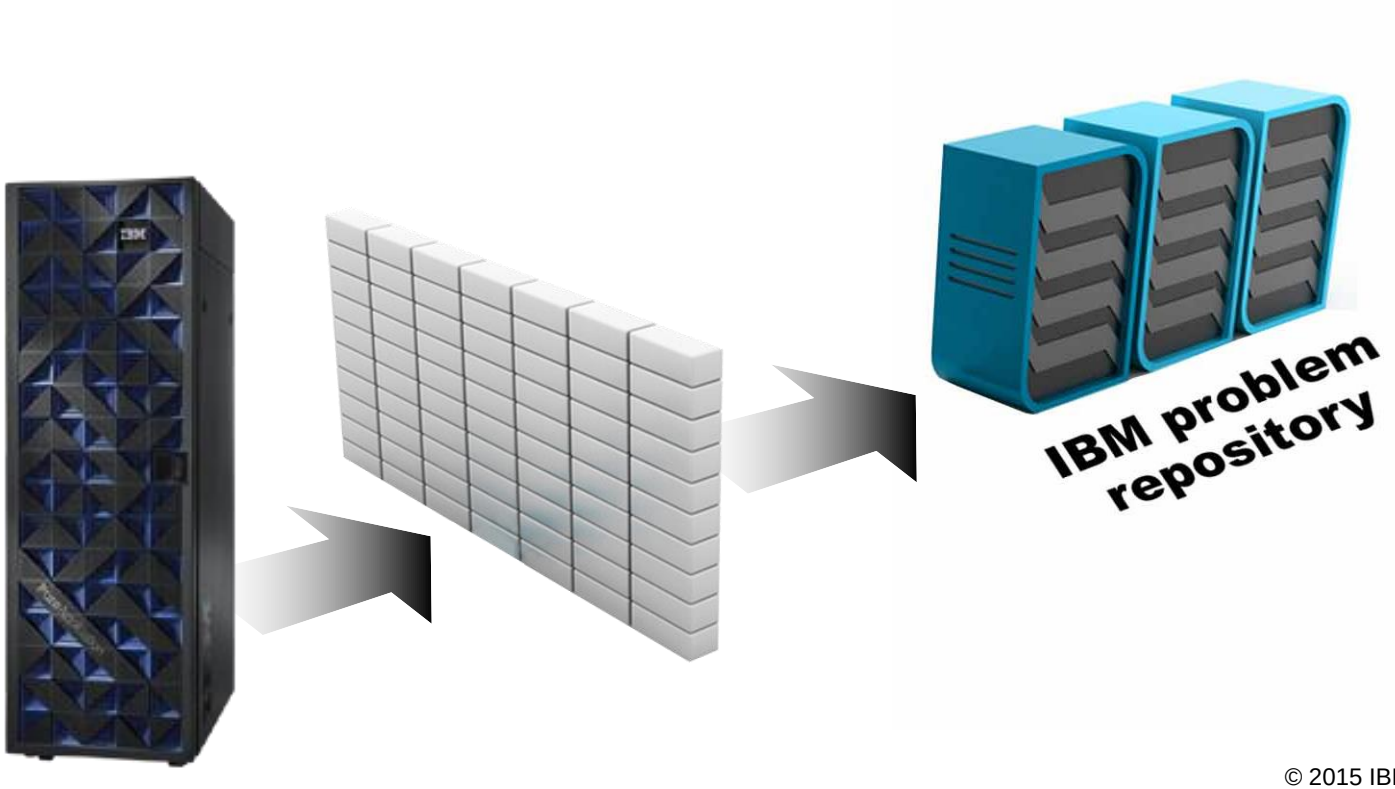
Backup what you need, when you need

Twenty-two (22) different artifact types are now supported in the Component Backup.

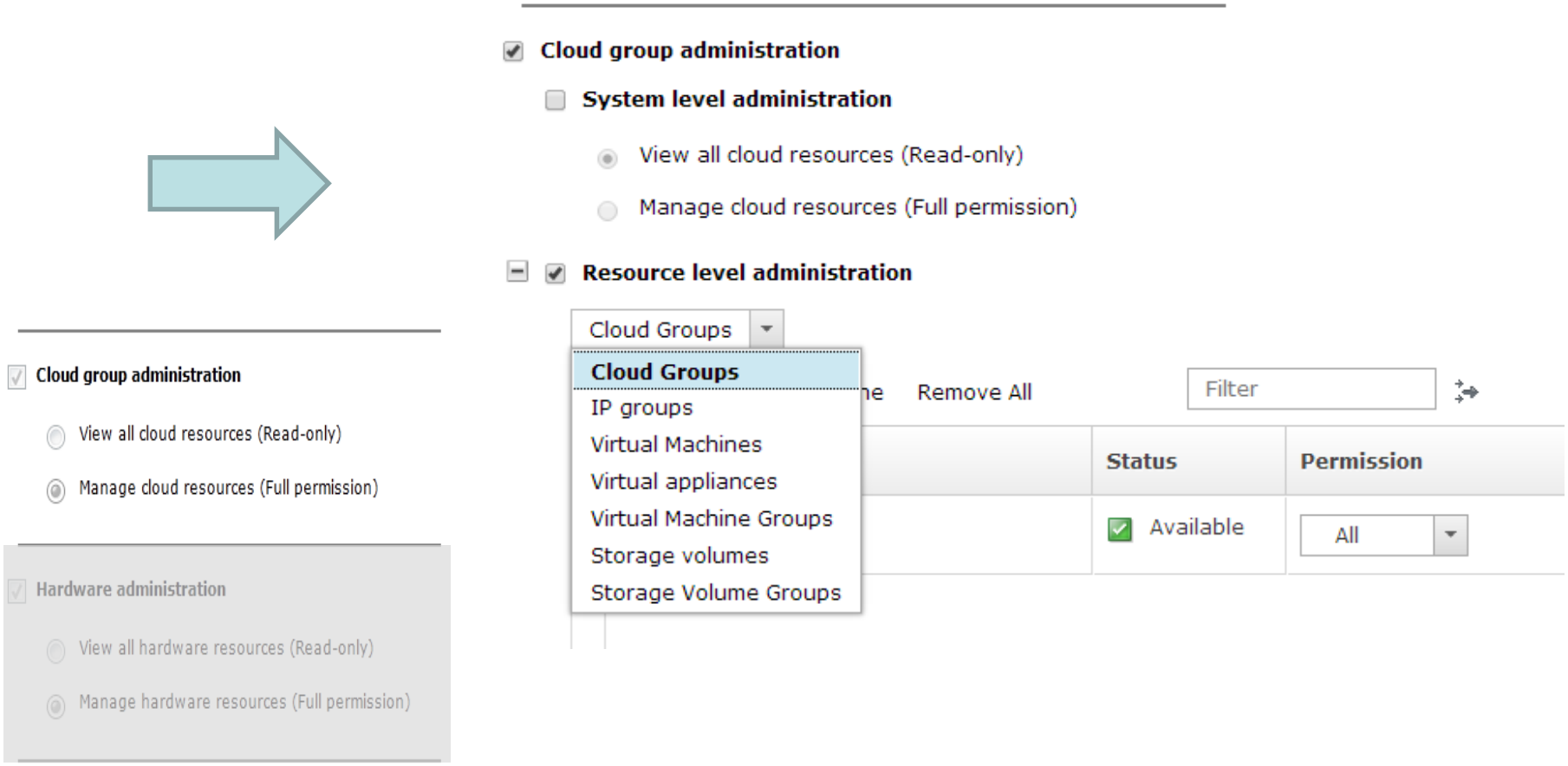


Call-home delivers **simplified system troubleshooting**

- **Problem reporting**
  - **Automatic PMR generation based upon hardware events (compute nodes, network, storage, power & cooling)**
  - **Automatic log collection and upload**
  - **Collection of system configuration information**
  - **Report showing PMRs generated by call-home**



Cloud Group Resource Level Administration



PureApplication Real Time Security Monitor

- The Real Time Security Monitor feature is new to Pure Application System and available in v2.0.0.0
- Current auditing feature provides audit trail information to track the accountability of a user
- One of the issues of analyzing audit trail records is the delay of the response time to any action violating the company security policies
- the real time security monitoring brings in the following values to the customer
  - It provides real time security monitoring data
  - An external SNMP server can be configured, so that traps specific for security monitoring can be sent to it
  - Separation of duties is achieved as only users with Auditing role or Hardware administrator can create or update the SNMP setting and list of security monitoring events to be monitored.

26

On SoftLayer

Available in SoftLayer data centers worldwide

PureApplication Service

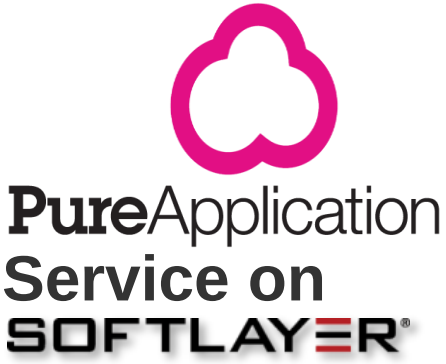
Off-Premises

What is PureApplication Service on SoftLayer?

Run applications *you have*

with the cloud economics *you want*

and the isolation *you need*

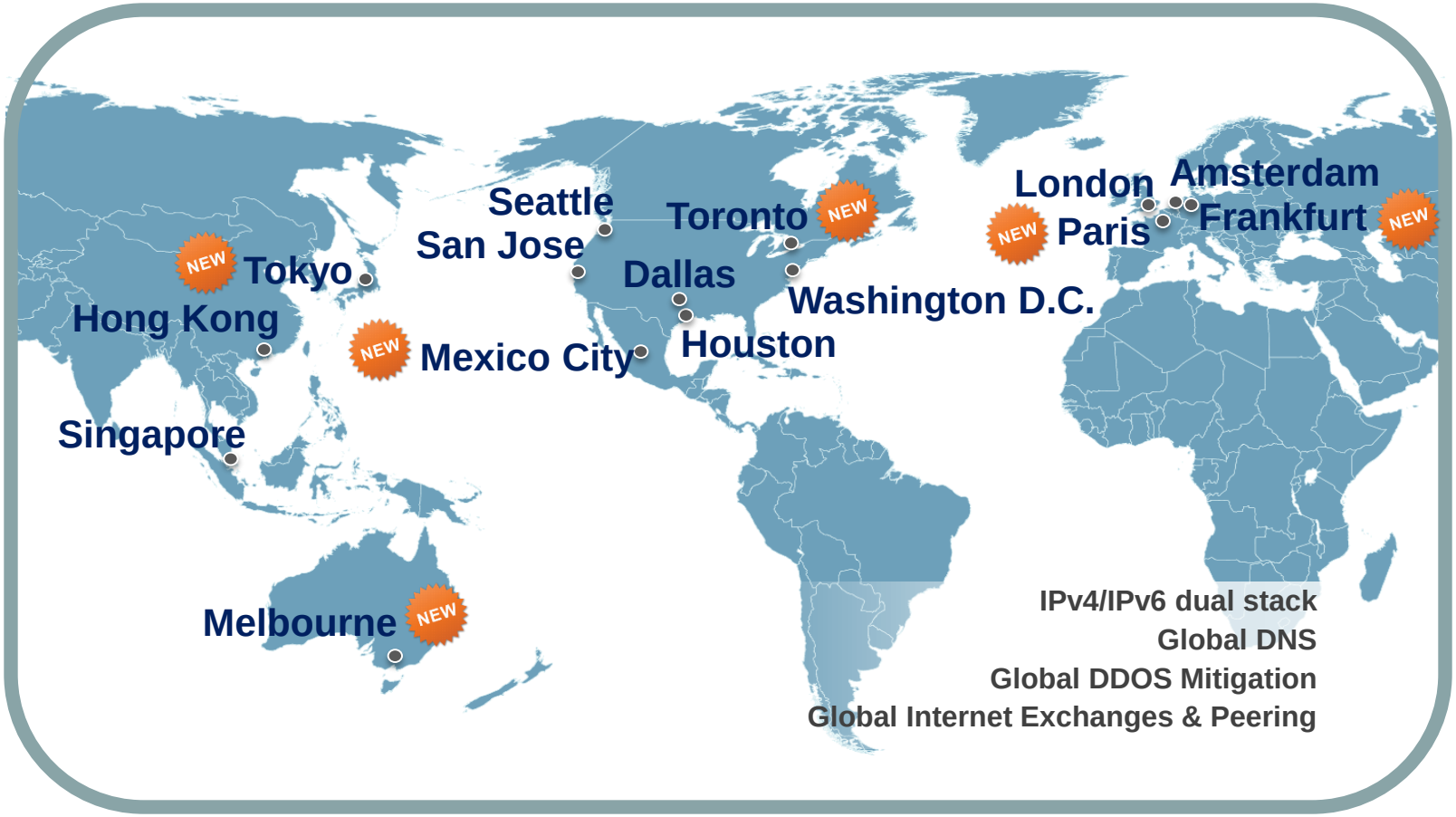


Separate	Built with dedicated SoftLayer hardware to isolate compute, network & storage to keep applications safer off-prem
Simple	Easiest way to run, scale and manage traditional enterprise applications and the underlying infrastructure
Speed	Fastest way to adopt off-prem cloud for traditional enterprise applications via Patterns
Seamless	Portability of traditional enterprise applications across on-prem and off-prem clouds without re-architecting system topology, storage, network designs, etc. via Patterns
Same	Identical interface & experience for developers & operations on-prem & off-prem

PureApplication Service is globally available on SL data centers

SoftLayer has 15 data centers in 11 countries across the globe (as of 1/27/2015)

PureApplication Service is available on all SL data centers based on capacity availability



NOTE: PureApplication Service may not be available on a specific data center due to available capacity

Enhanced Hybrid Enterprise Connectivity

Two ways to connect PureApplication Service to on-premise systems

1

Corporate Office

Secure 2-way VPN Tunnel over internet

PureApplication Service

2

Corporate Office

SoftLayer Point of Presence (PoP options: 1Gbps OR 10Gbps)

PureApplication Service

IBM intends to support PoP capability for PureApplication Service. Subject to change without notice

Enterprise Connectivity

	Secure 2-way VPN tunnel	Point of Presence (PoP) NEW
Technology	Connect PureApp VPN server to an IPSec VPN Server hosted anywhere on the internet	Dedicated connection between client site and PureApp Service in a specific datacenter
Connectivity	Over public internet between 2 VPN servers	Direct connection between client, internet service provider and SoftLayer
Charge	No-charge to client Order VPN tunnel via provisioning form or a PMR	2 orderable part numbers (available by 03/13) PN 1: 1Gbps PN 2: 10Gbps

IBM intends to support PoP capability for PureApplication Service. Subject to change without notice

Security with Out of the Box Traffic Management of Service Protection

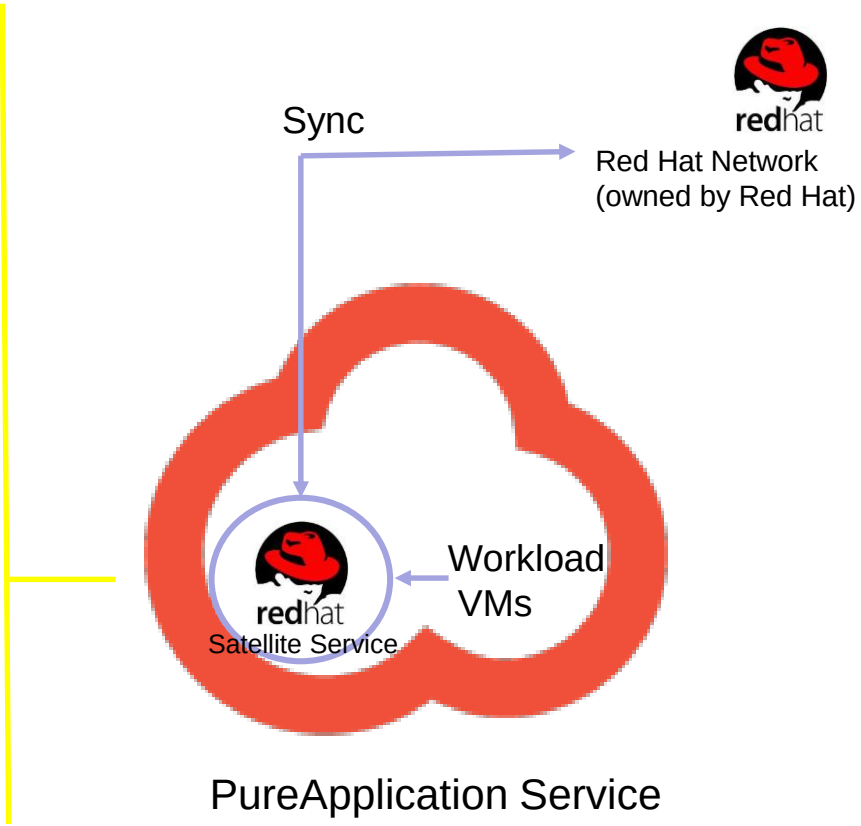
1. Built-in policies for Application security protection for public IPs
2. Customization for specific policy based on client request
3. Application security infrastructure deployed as part of PureApplication Service
4. Powered by IBM DataPower & fully managed by PureApplication Service

IBM intends to **provide Traffic management for Application Security protection** for PureApplication Service. Subject to change without notice

Out-of-the-Box Dedicated Red Hat Satellite Service

- Fully managed & dedicated Red Hat Satellite Service with your PureApplication Service on SoftLayer offering
- Client deploys patterns
- PureApplication Service auto-injects the Satellite Service endpoint in VMs
- Client runs “yum” commands from VM to update OS

```
bash-4.1# yum list
Loaded plugins: product-id, rhui-lb
Installed Packages
BESAgent.x86_64                          9.0.586.0-rhe5             installed
ConsoleKit.x86_64                        0.4.1-3.el6                @anaconda-RedHa
ConsoleKit-libs.x86_64                   0.4.1-3.el6                @anaconda-RedHa
DeviceKit-power.x86_64                   014-3.el6                  @ftp3-updates
GConf2.x86_64                            2.28.0-6.el6               @anaconda-RedHa
LINUX4AE.noarch                          2.1-1.13.hl                installed
MAKEDEV.x86_64                           3.24-6.el6                 @anaconda-RedHa
ModemManager.x86_64                      0.4.0-3.git20100628.el6    @anaconda-RedHa
NetworkManager.x86_64                    1:0.8.1-34.el6_3           @ftp3-updates
NetworkManager-glib.x86_64               1:0.8.1-34.el6_3           @ftp3-updates
```

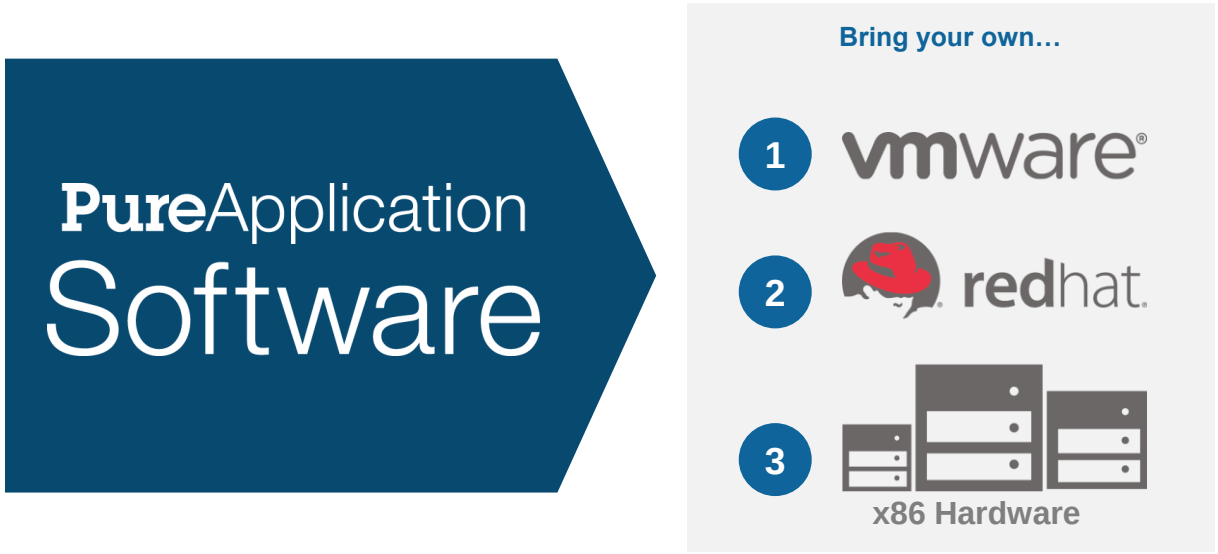


Meet critical **business needs** with **99.9%** availability SLA for PureApplication Service

1. Get 99.9% SLA for PureApplication Service for no additional charge
2. Covers availability for components of PureApplication Service managed by IBM
3. Run your mission critical applications with higher confidence

PureApplication Software

Offering at a Glance



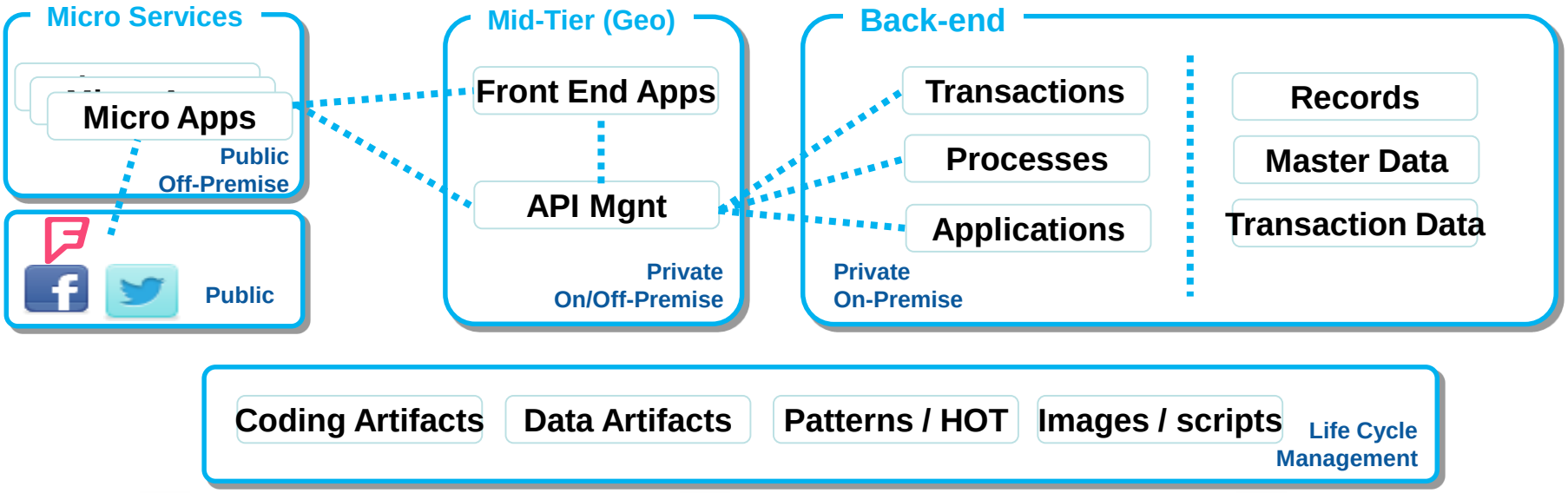
Values

- Similar speed / simplicity as PureApp System / Service, for deploying and managing workloads: patterns, lifecycle management (scaling, monitoring, caching…)
- Flexibility to run on your own HW

Differences from System or Service

- Requires install / config of the environment vs. pre-integrated PureApp System / Service experience
- Does not include integration / config / management of storage, network and hypervisors.
- Client owns support/maintenance of hardware, firmware, virtualization

The future application landscapes need a Dynamic cloud

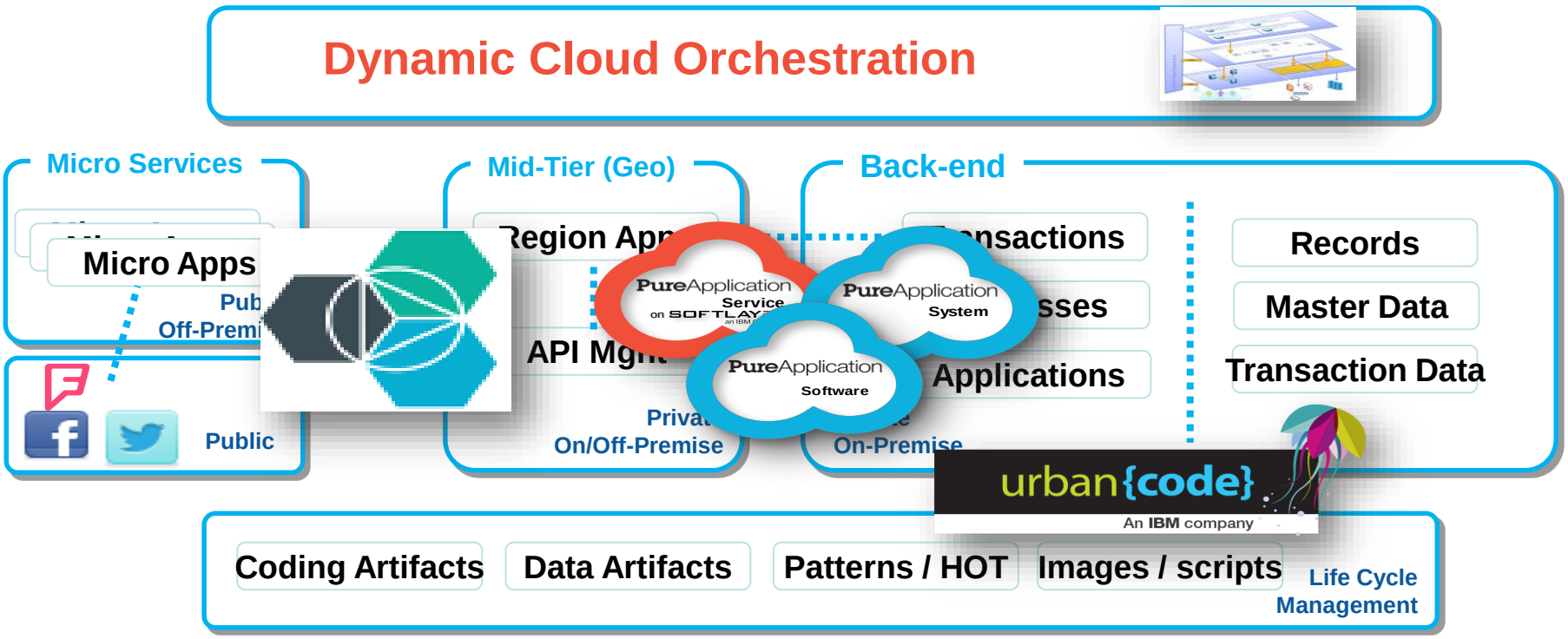


Very fast life cycle
Speed of deploy and execution
Scale for the unpredictable

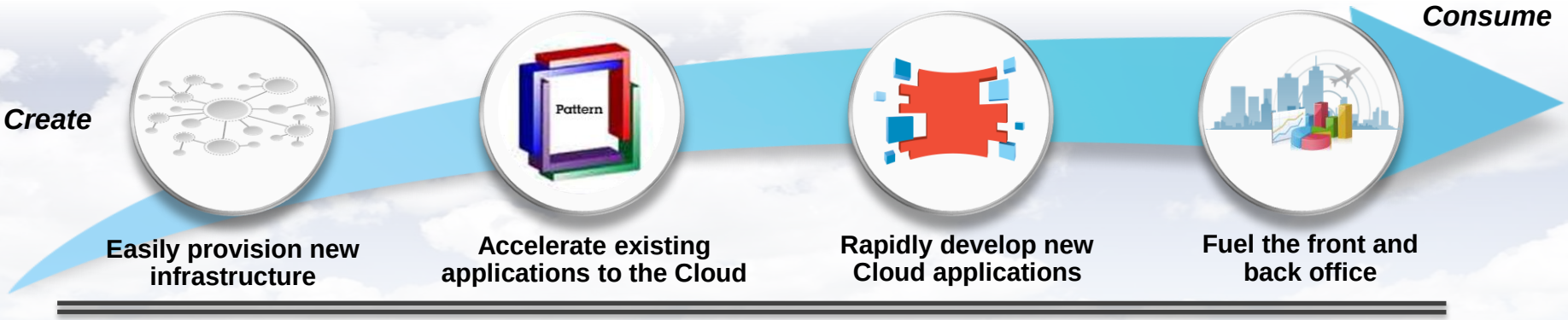
Fast and automate life cycle
Fast repeatable deploys
Elastic behavior

More stable and predictable life cycle
API exposure for up stream levels
Elastic throttling

The future application landscapes need a Dynamic cloud



IBM delivers value across the cloud continuum



SOFTLAYER® PureApplication Bluemix 100+ SaaS Applications

Bring your own

License…… Application…… Idea……

PureApplication v2.1

System, Service, and Software

Freedom of Choice to adopt Open Technologies

- Docker support to combine, deploy and manage Docker containers with Patterns for:
  - Up to 10X faster deployments, scaling & upgrades
  - Seamless portability across clouds
  - Access to 14,000+ pre-built apps
- Enhanced Chef support to integrate and leverage Chef investments

Accelerate App Delivery with Enterprise-Strength Hybrid Cloud

- Faster connectivity between hybrid environments
- Secure fine grain access control to on-premises data by off-premises applications
- Off-premise backup and restore for improved business continuity
- Out of the box Denial of Service protection for improved security

Operate at Dynamic Scale in the environment you choose

- New support for BYOHW to write applications once, deploy
  … on an off-prem cloud,
  … on a pre-integrated system,
  … on your own hardware,
  … or anywhere Docker containers can run