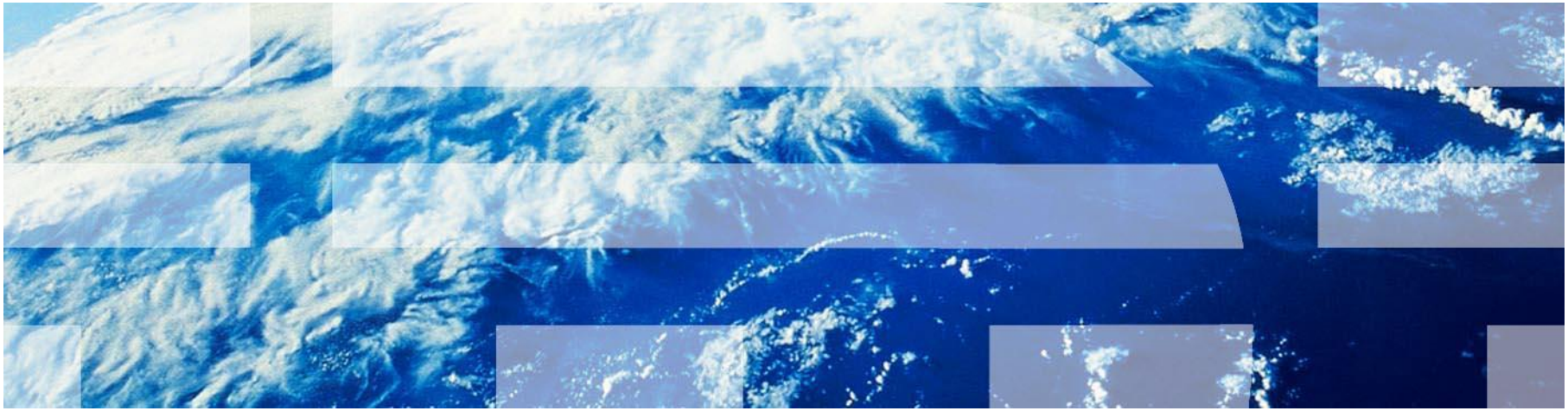
Enabling Hybrid Cloud with PureApplication - Second Generation



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Agenda

- Why Cloud?
- IBM PureApplication System
- Second Generation Hardware
- Second Generation Firmware
- Hybrid Cloud

Why using cloud?

A change of vocabulary:

Months  **Minutes**

A change of mindset:

“Heroics don’t scale”

A change of approach:

Remove process/people bottlenecks: **Automate everything!**

Progressing Through the Cloud Maturity Model

(0) Virtualization

"I want to get more out of my existing hardware"

(2) Cloud Enabled

"I want to move my *existing middleware workloads* to the cloud"

"I want control and ownership"

(4) Dynamic Hybrid

"I want to strategically use public and private cloud together"

(1) Business Services (SaaS)

"I want to use an app without having to own it"

"I want consumption based pricing"

(3) Cloud Native

"I want to rapidly build new, engaging applications in a continuous delivery model"

"I want to consume, build, and expose APIs"

IBM’s patterns of expertise

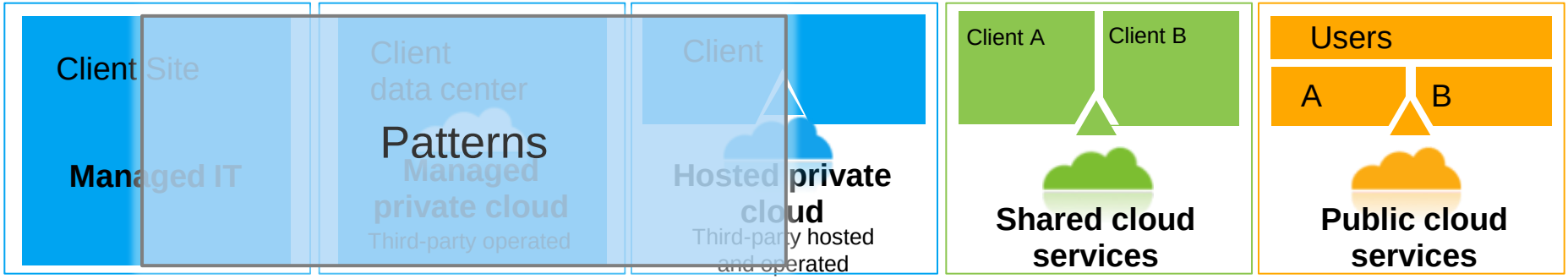
On Premise

IT is provided “as a service,” over an intranet, within the client and behind the firewall

Hybrid

Off premise

IT activities / functions are provided “as a service,” over the Internet



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What is PureApplication System?

Application patterns from IBM and partners

Integrates an application platform optimized for enterprise applications

Inherits the capabilities of **PureFlex System**

Infrastructure Patterns of Expertise

- 200+ ISV business applications
- Business intelligence
- Business process management
- Web experience (Portal)

Application Platform

- Application Optimization
- System wide Management
- Automation & Scaling
- Caching & Elasticity
- Application Centric Provisioning
- Usage Metering
- Security
- Monitoring
- App Lifecycle Management
- License Management
- Self-service
- Data management

System Infrastructure

- Integrated Server, Storage, Network
- Power Management
- Storage & VM Optimization
- Virtualization
- Integrated System Management
- Provisioning
- Security
- Monitoring
- IT Lifecycle Management
- System design

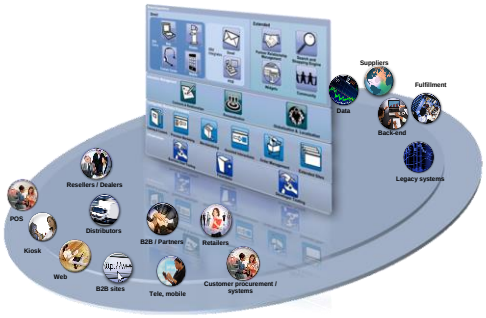
PureApplication System

Pattern-based deployment

Common cloud platform

Dynamic resource scalability

Automated IT resource provisioning



Deploy

Deploy

Deploy

Cloud Application Platform
(PaaS)

User-based self-service

Catalog of services

Multi-tenancy

Usage-based reporting

Virtualization

Automated IaaS

Service level management

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Now available for orders!

PureApplication System x86 & Power - Generation 2 HW

Improved performance, lower power requirements & greater flexibility

W2500: x86
W2700: Power

- Up to **10% better price/performance** with new Intel and Power compute nodes for Mini and Enterprise configurations
- Up to **2x better price/performance** for consolidation & memory intensive applications on Enterprise configurations, now with 2x memory per core
- **Up to 10 % reduction in power requirements** for Enterprise configurations, now able to utilize single phase power
- **Simpler datacenter onboarding** for Mini configurations, now in a 42U rack
- Utilizes the same **high performance networking and storage** design as Gen 1 for Mini & Enterprise configurations
- **Investment protection** for Gen 1 clients with ability to add Gen 2 compute nodes into Gen 1 Systems

"Mini" – Intel & Power
32, 64, 96, 128 cores

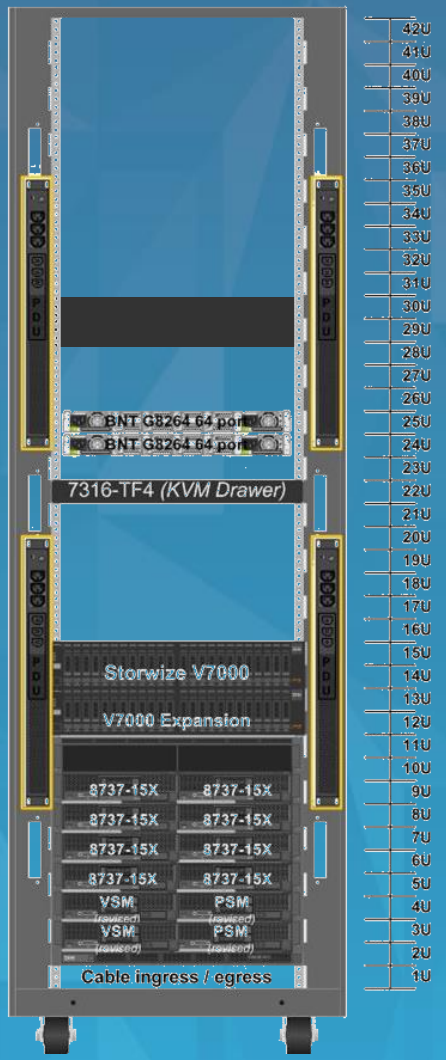
Top of Rack Switches
320 Gbps to DC

42U Rack

Storage:
- V7000
- 2.4 TB SDD
- 24 TB HDD

PDU:
- 4x30A 1ph

Compute:
- **Intel Ivy Bridge 2.6 GHz and Power 7+ 4.1 GHz**
- Memory: 16 GB / core



"Enterprise" – Intel & Power
32, 64, 96, 128, 160, 192, 224, 320, 384 cores

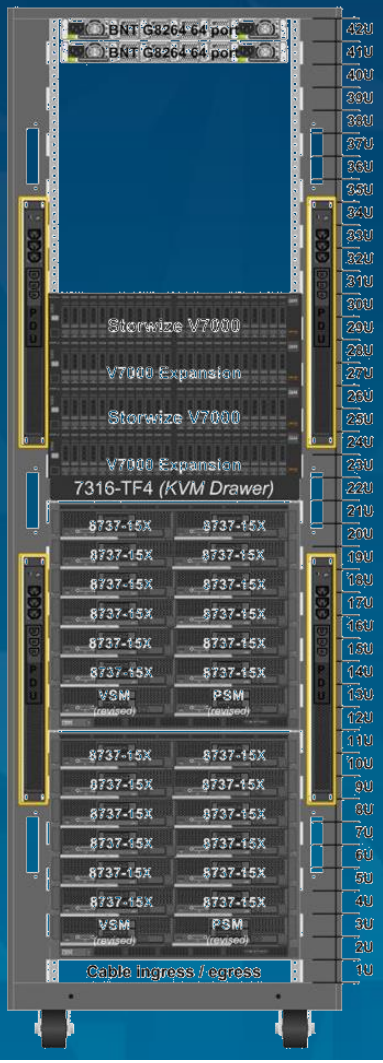
Top of Rack Switches
320 Gbps to DC

42U Rack

Storage:
- V7000
- 6.4 TB SDD
- 48 TB HDD

PDU:
- **4x60A 1ph or 3ph**

Compute:
- **Intel Ivy Bridge 2.6 GHz and Power 7+ 4.1 GHz**
- **Memory 32 GB / core**



PureApplication System Configurations – Gen 2 offerings

Mini (42u)

X86 & POWER

32 Cores
0.5 TB RAM

→ 64 Cores
1 TB RAM

→ *96 Cores*
1.5 TB RAM

→ *128 Cores*
2 TB RAM

2.4 TB SSD
24 TB HDD

Enterprise (42u)

X86 & POWER

32 Cores
1 TB RAM

→ *64 Cores*
2 TB RAM

→ 96 Cores
3 TB RAM

→ *128 Cores*
4 TB RAM

→ *160 Cores*
5 TB RAM

→ 192 Cores
6 TB RAM

→ *224 Cores*
7 TB RAM

→ 320 Cores
10 TB RAM

6.4 TB SSD
48 TB HDD

→ 384 Cores
12 TB RAM

- **All configurations include:**
- **Rack, Chassis, PDUs**
- **Networking** (Top of Rack, Chassis & Fiber)
- **Pre-integrated software entitled for full capacity of configuration:** OS, Hypervisor, application server, database, Java runtime, cloud provisioning, management and full stack monitoring

→ Upgrade configurations **without taking an outage**

External storage support via fiber channel

IBM SAN Volume Controller (SVC)

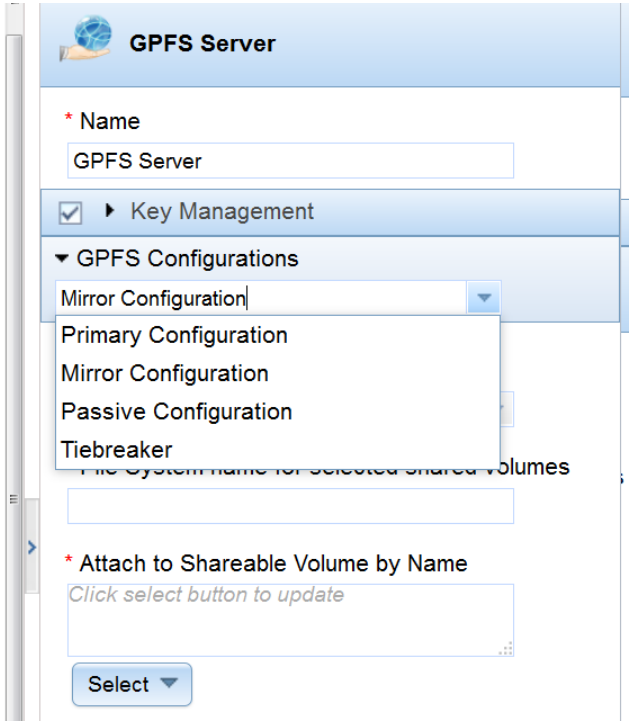
Fiber Channel

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

General parallel file system (GPFS) support

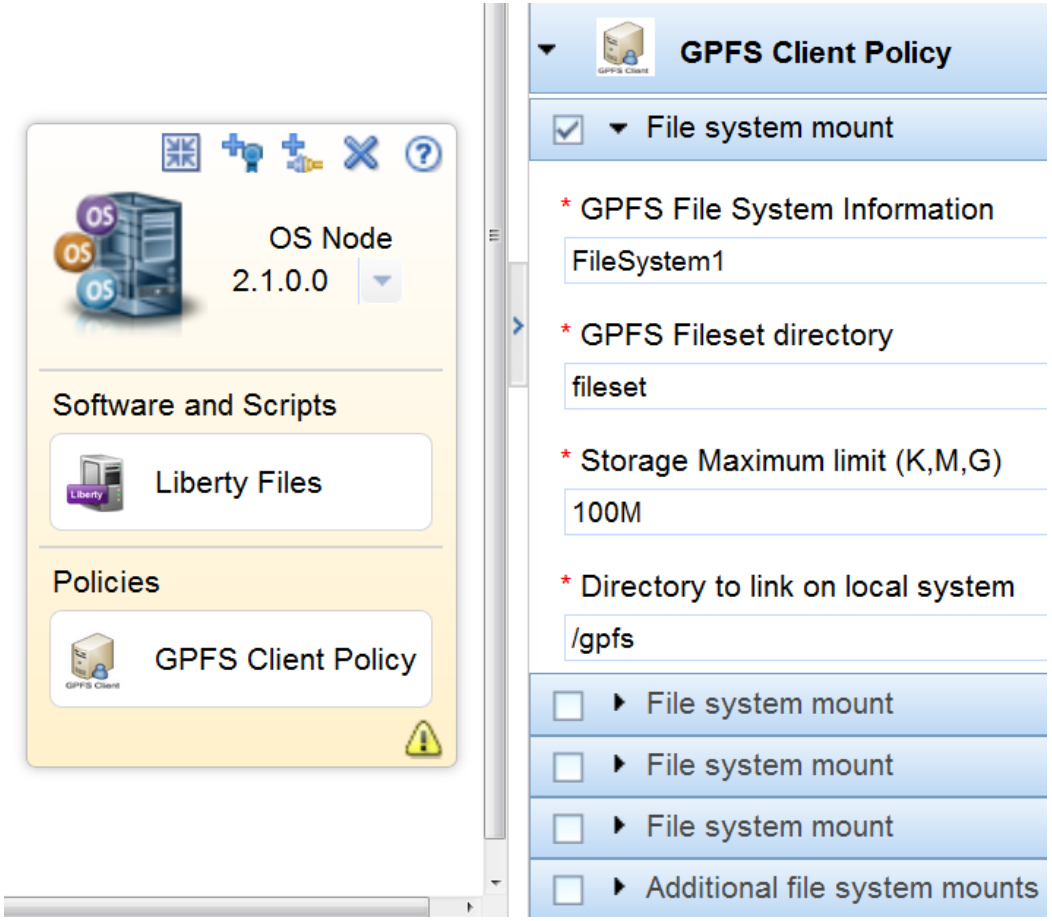
- GPFS server
  - Single virtual application
  - Administrator:
    - Creates storage
    - Chooses the configuration
    - Deploys the pattern
  - Maintenance and managemer provided by the pattern



- GPFS shared service used to connect to the GPFS server
  - Simplifies client connection

GPFS client for patterns

- Pattern developer attaches GPFS Client policy
  to OS Node
- GPFS Server location not needed
  - Connection to GPFS server via shared service
- Storage maximum is a self-imposed quota restriction by the pattern
  - Provides “friendly” tenant support
- File systems are mounted in a common location
  - Linked directory creates a symbolic
    link to the mounted file system



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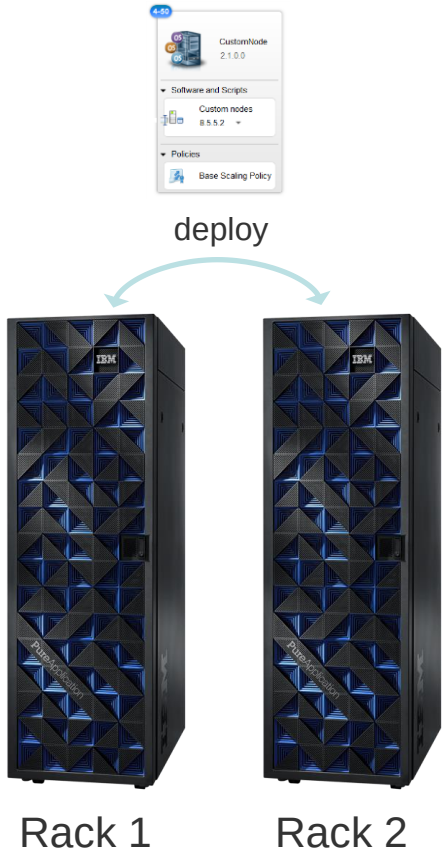
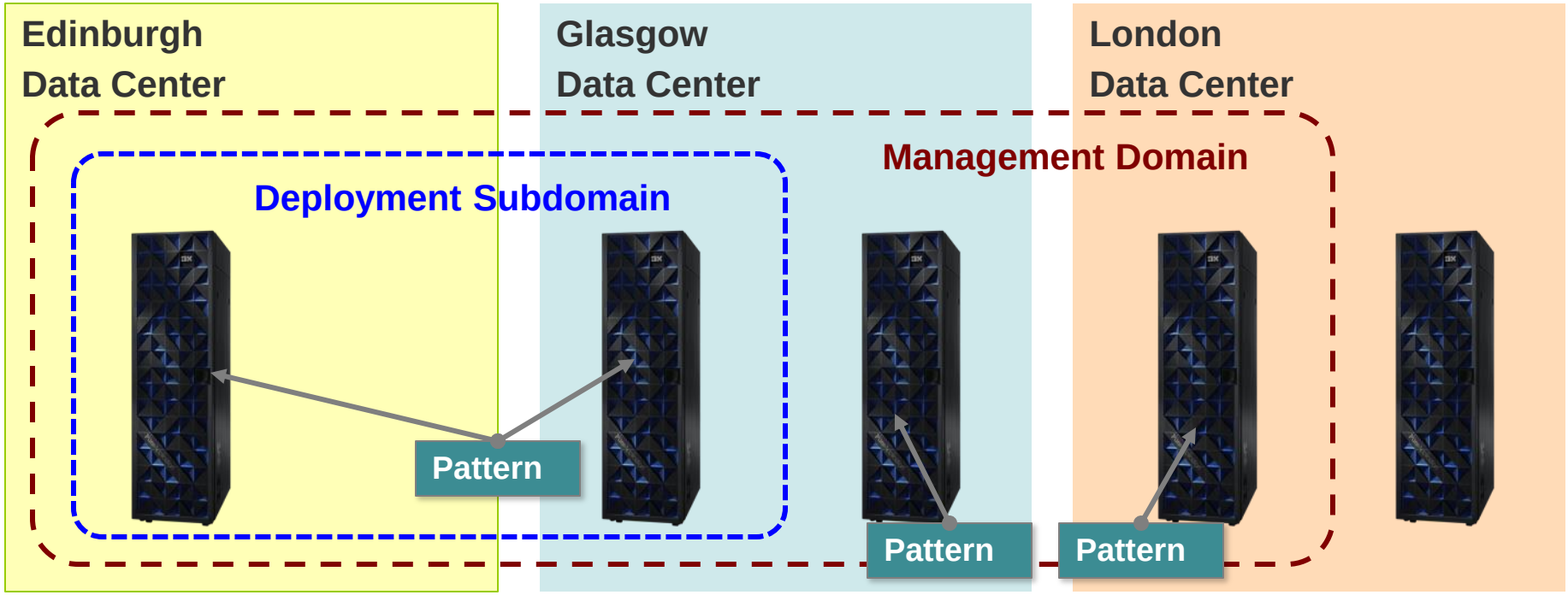
Multi – Rack deployment

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



1. Deploy the pattern across the racks, choosing where each image within the pattern should run
2. Build a pattern on any rack using artifacts from all racks
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.

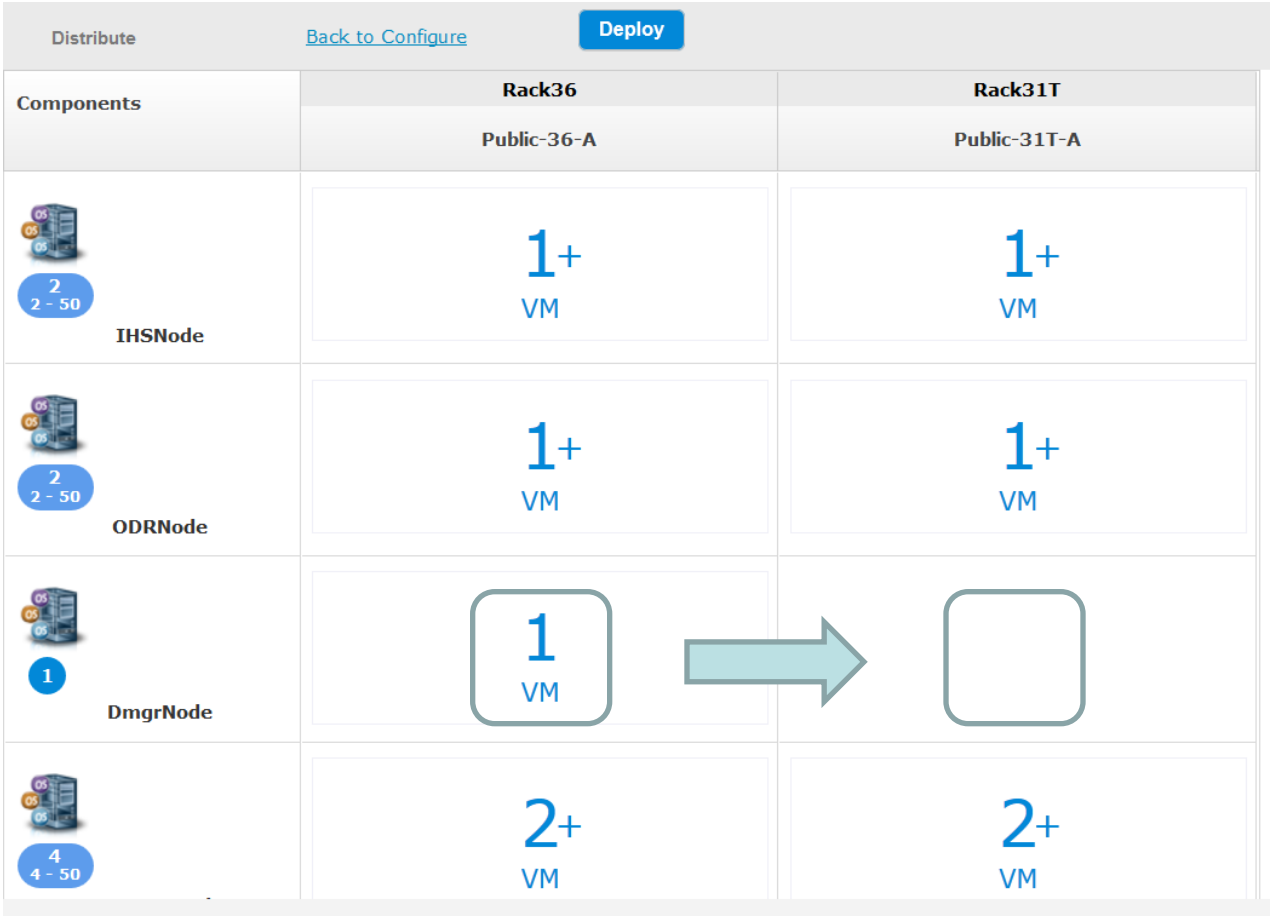
Systems within a domain can be grouped into **Deployment Subdomains**. A pattern can be deployed across multiple racks within a subdomain.

Subdomains assume a low latency connection between the systems.

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

Deploying across multiple systems in a subdomain

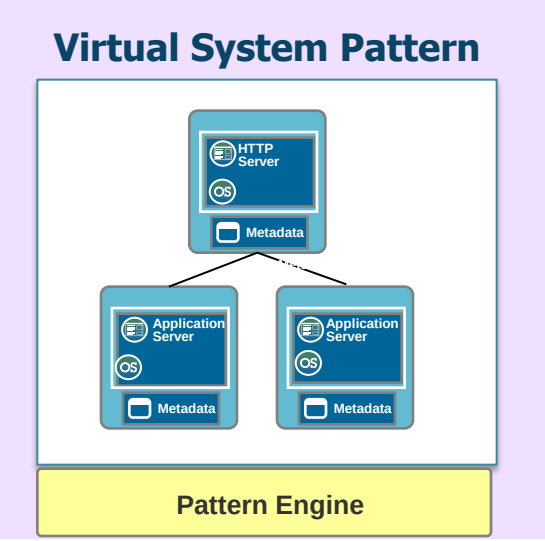
Drag and drop virtual machines to deploy them across cloud groups and systems

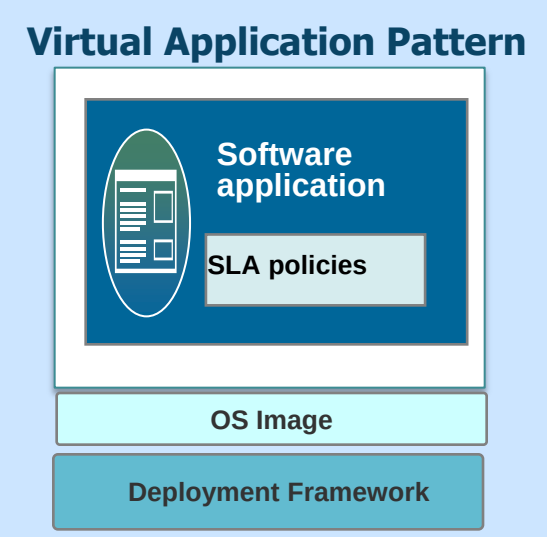


Enhanced pattern engine

Classic deployment models

- Patterns have **delivered proven benefits**: simplicity, speed, and TCO savings
- **Over 200+ patterns** are available today from IBM and business partners





• Automated deployment of middleware topologies

•Traditional administration and management model

•Application and infrastructure driven elasticity

•Highly automated deployments using expert patterns

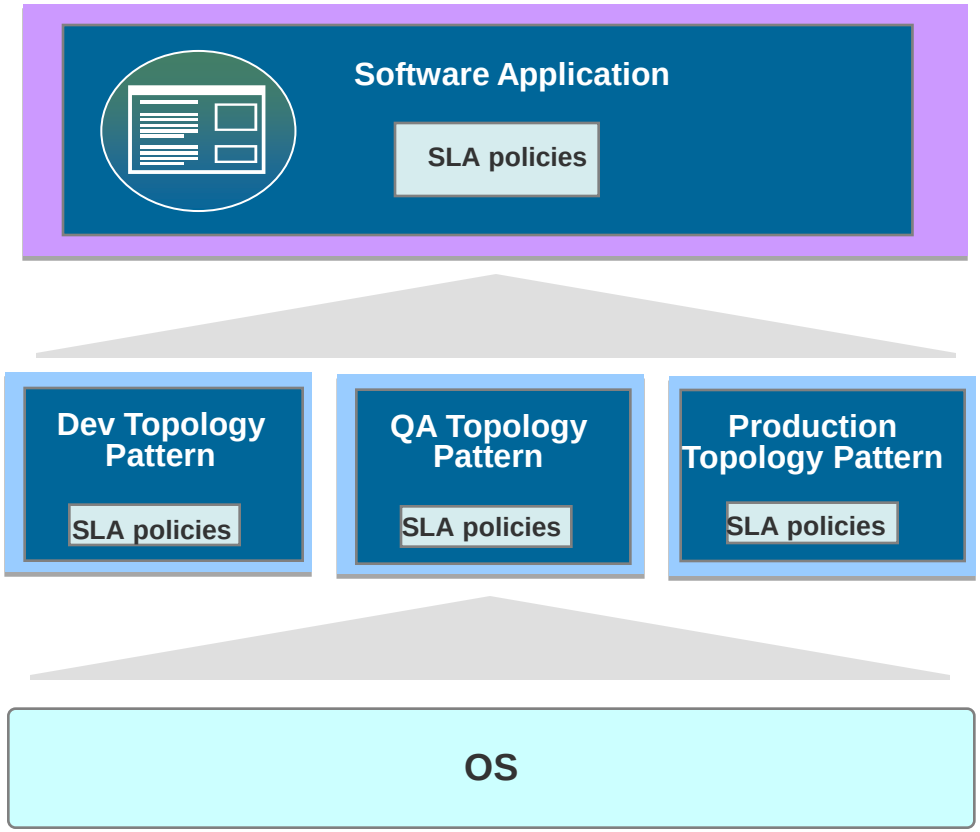
•Business policy driven elasticity

•Leverages elastic workload management services

More customization

Best TCO

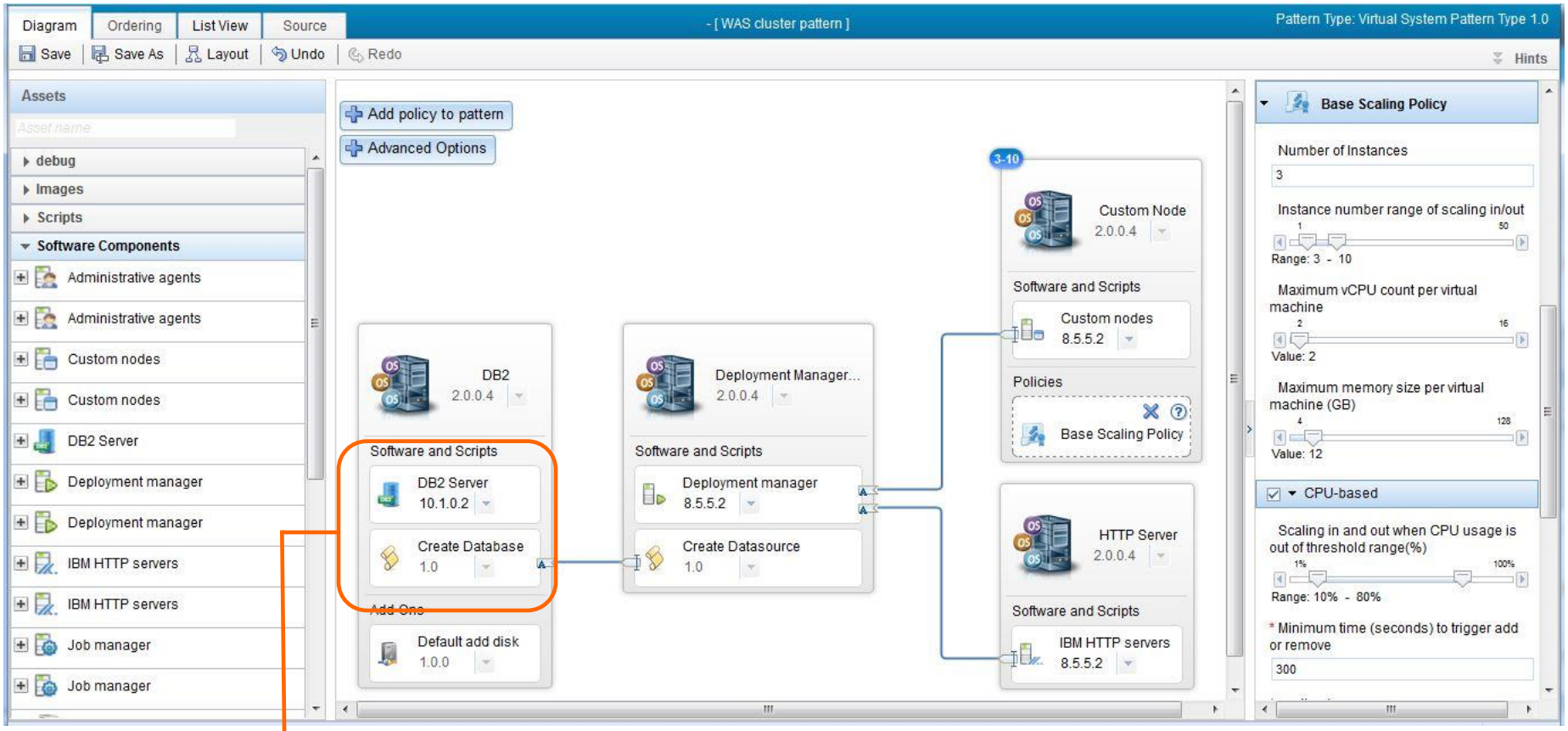
Customize patterns to meet your IT standards and needs



Reusable pattern components simplify pattern composition

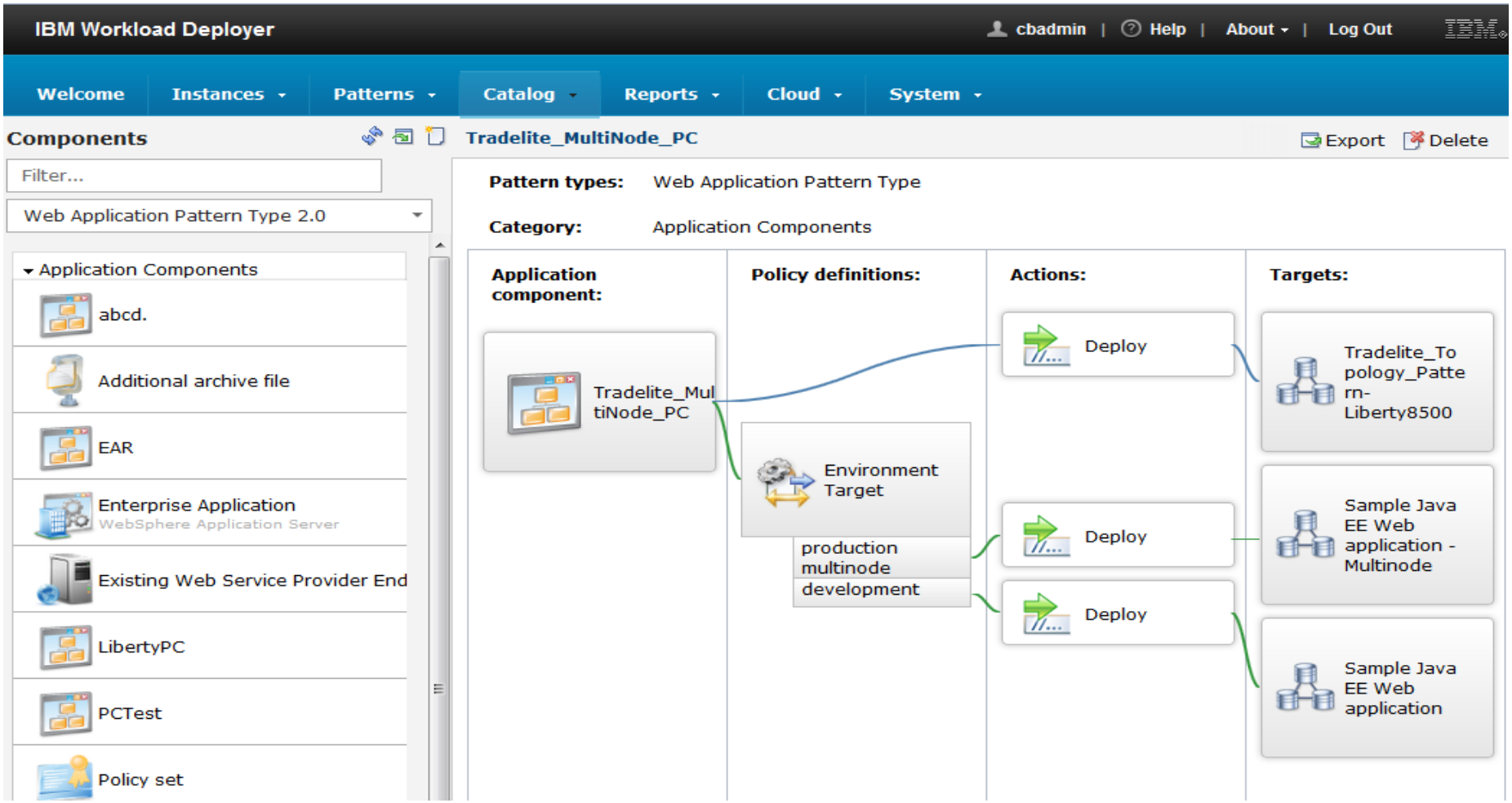
- ✓Existing patterns run unchanged
- ✓Support for corporate IT standards
- ✓Flexible control over middleware topologies for virtual applications
- ✓Simplified tooling
- ✓Lifecycle management for both topology and virtual application patterns

Configuring a virtual system pattern in the pattern builder



- Add script packages in pattern editor
- Versioning of patterns, script packages, etc.

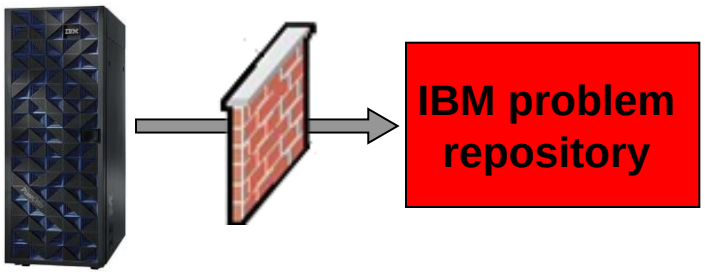
Building custom pattern components for virtual applications



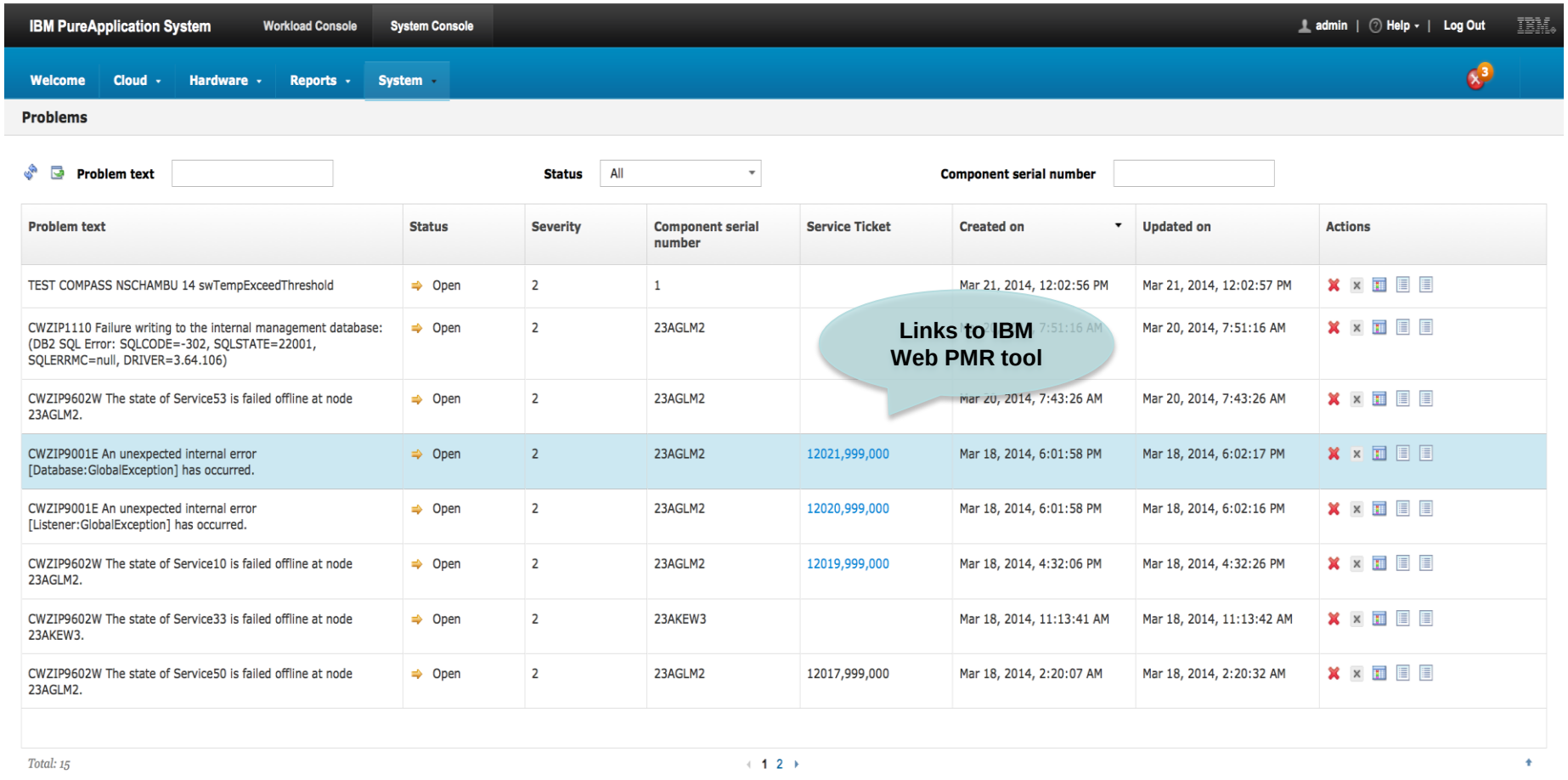
Serviceability Enhancements

Call-home delivers **simplified system troubleshooting**

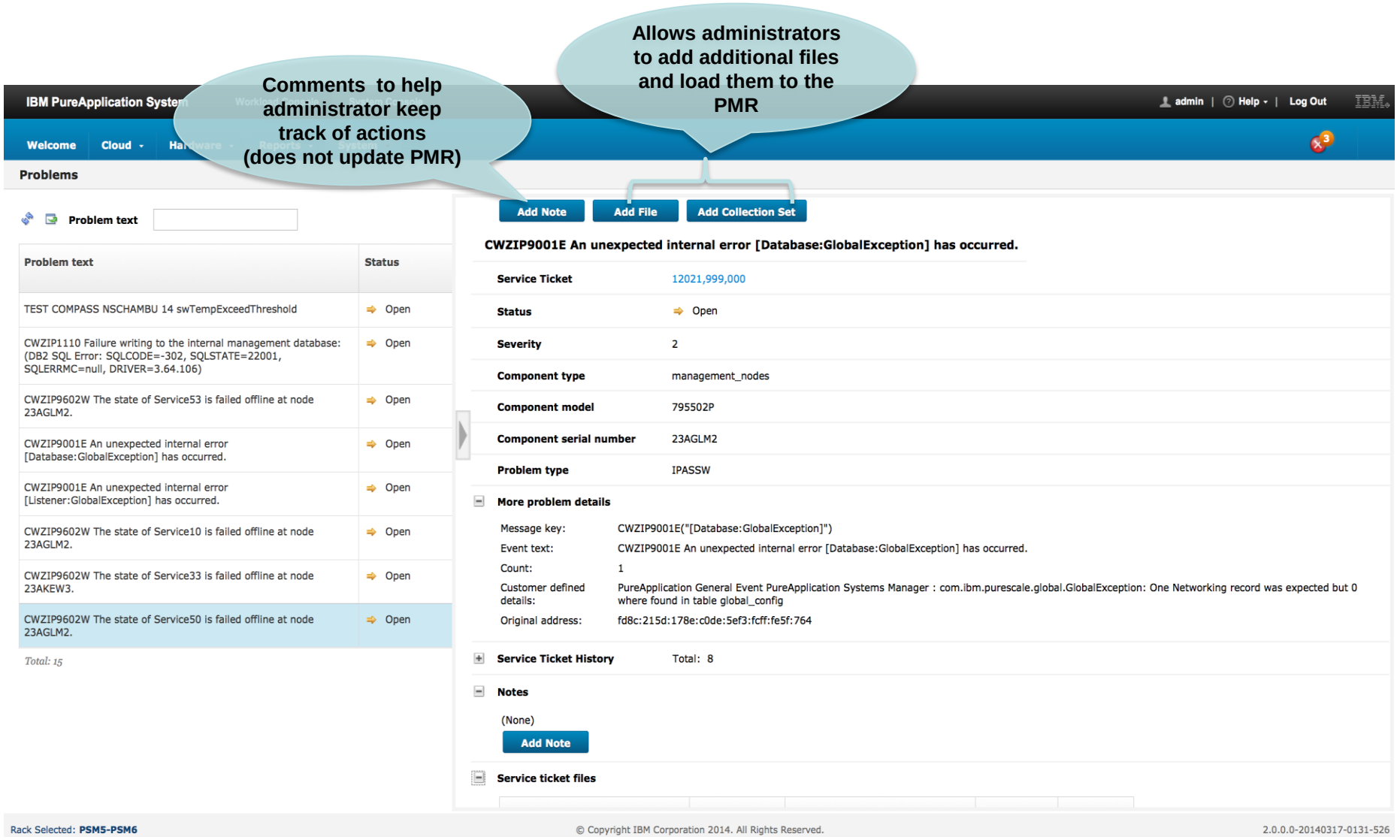
- Problem reporting
  - Automatic PMR generation based upon hardware events (compute nodes, network, storage, power & cooling)
  - Automatic log collection and upload
  - Collection of system configuration information
  - Report showing PMRs generated by call-home



View PMRs directly from the system console



PMRs detail page in the system console



Guest OS Patch Management - Enhancements

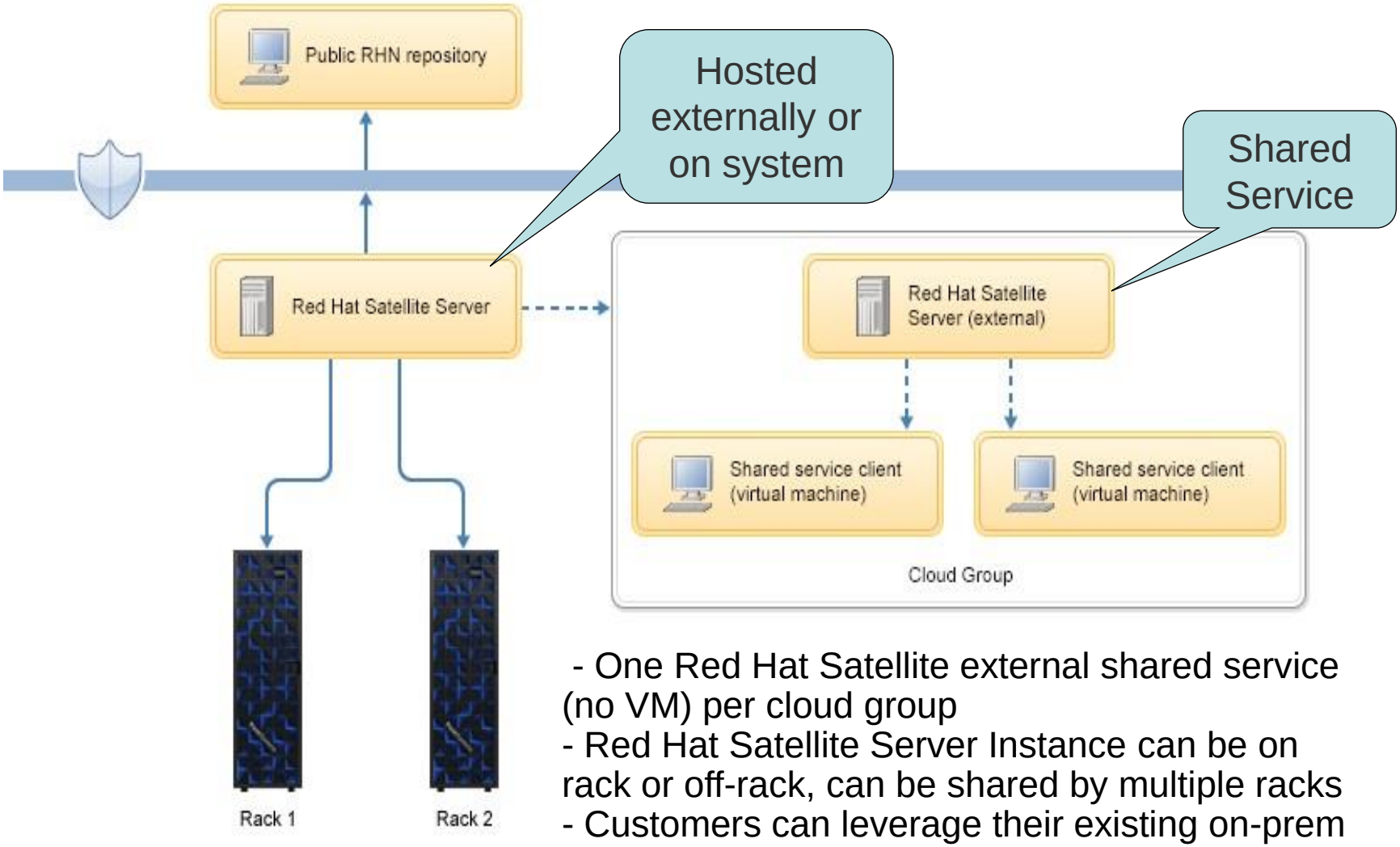
Patch Management solutions

- IBM Endpoint Manager (IEM) Integration
  - Windows guests
  - AIX guests
- IEM Pattern type includes
  - IEM Relay Shared service, client plug-ins

- Red Hat OS Update
  - Red Hat Satellite Server integration – *New in V2*
  - Red Hat Update Infrastructure (RHUI) – *deprecated in V2*

- RHUS Pattern type covers
  - RH Satellite Server, RHUI shared services, client plug-ins
  - A Pattern type to install RH Satellite Server

RH Satellite Server (external) Shared Service Overview



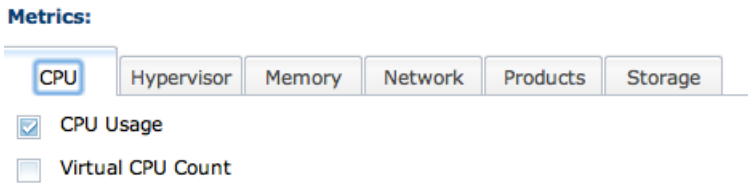
- One Red Hat Satellite external shared service (no VM) per cloud group
- Red Hat Satellite Server Instance can be on rack or off-rack, can be shared by multiple racks
- Customers can leverage their existing on-prem Satellite Server to patch Guest VMs in PureAS.

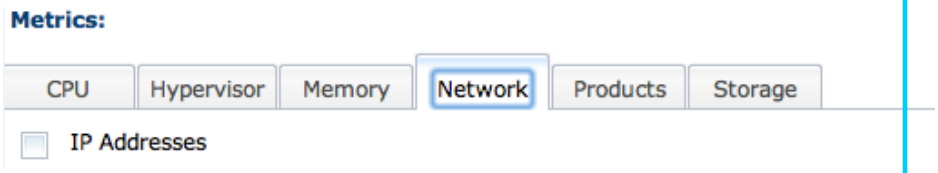
Other Enhancements

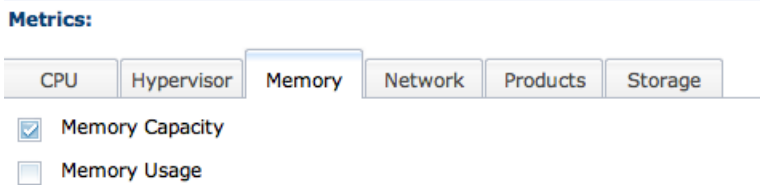
Chargeback reports

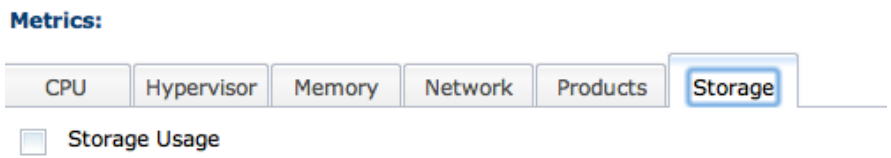
Perform internal chargeback

- Generate a report with one or more metrics
- Aggregate Metrics by User(s), Group(s), or Instance(s)
- Export the report, as a spreadsheet, for cost calculation









Open standards integration

OpenStack Support

Easily deploy OpenStack workloads onto PureApplication System

- Use key OpenStack APIs to quickly import and deploy images
- Existing OpenStack CLI client support minimizing effort required to invoke PureApplication from existing OpenStack automation, such as Chef recipes
- Improves portability across multiple cloud platforms
- Moving up to Ice House Level of APIs

Why and How Heat?

- There is a growing community around the creation of Heat Orchestration Templates
  - Providing the capabilities to manage and deploy HOT documents delivers on the promise of keeping the PureApplication System open
  - Integrating with Heat aligns with the PureApplication System strategy to increase support for OpenStack
- Phased Adoption Approach
  - **Consume** and deploy community Heat content in PureApplication System
    - Heat runs in parallel to the existing deployment engine
    - Two deployment engines, two pattern representations
  - **Accelerate** Heat development so that all patterns can use Heat as they are deployed
    - One deployment engine (Heat), two pattern representations
  - **Converge** on the Heat Orchestration Template format as the internal representation of patterns in the pattern engine
    - One deployment engine (Heat), one pattern representation (HOT)

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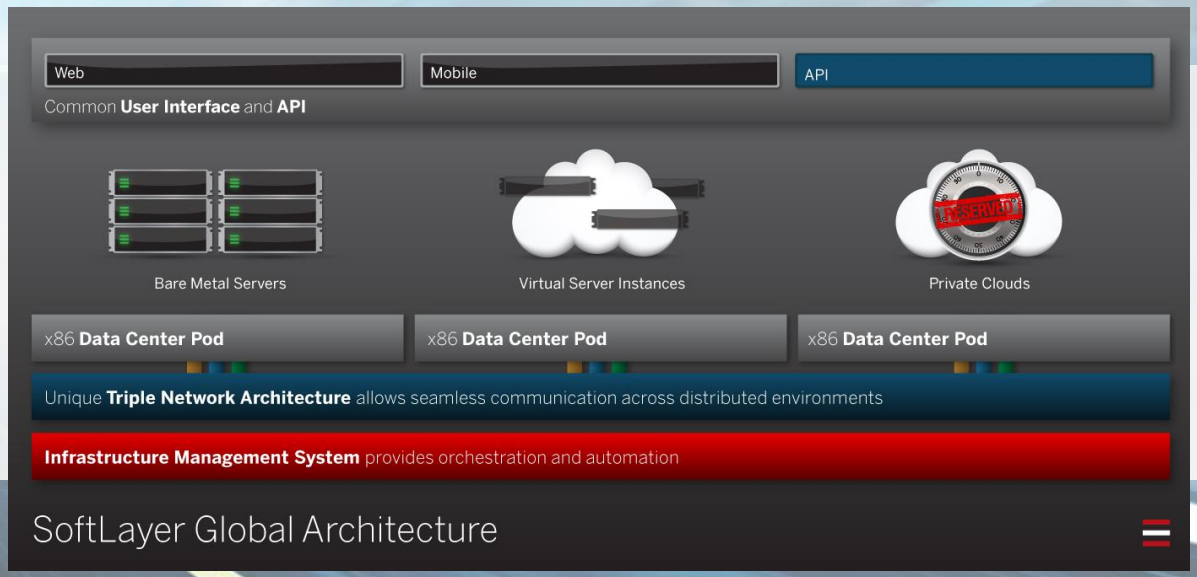
SoftLayer: A Global Cloud Leader

Unified architecture enabled by powerful software

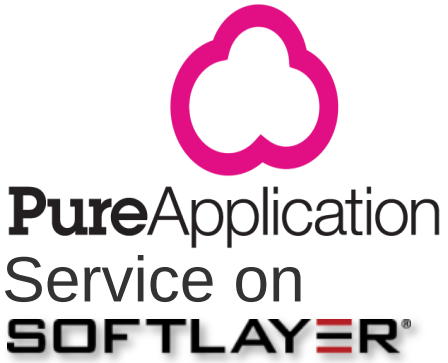
- Highly flexible architecture
- One integrated platform for public cloud servers, private clouds, bare metal servers
- Unified systems management & API
- Build hybrid, distributed, high-performance architectures; manage from a single pane of glass

- 13 data centers
- 17 network PoPs
- 100,000 devices
- 22,000,000 domains
- 21,000+ customers



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
Seamless	**Portability** of traditional enterprise applications across on-prem and off-prem clouds **without re-architecting** system topology, storage, network designs, etc. via Patterns
Simple	Easier way to run, scale and manage traditional enterprise applications and the underlying infrastructure
Speedy	Faster way to adopt off-prem cloud for traditional enterprise applications via Patterns
Same	Identical interface & experience for developers & operations on-prem & off-prem

Focus on Your Application - Let PureApplication Handle the Rest

PureApplication System and PureApplication Service on SoftLayer brings *cloud economics, hybrid cloud,* and *unlimited elastic growth*

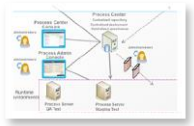
Private
On-Premise

PureApplication System

Public
Off-Premise

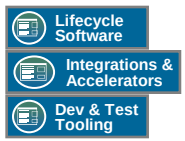
PureApplication on SOFTLAYER®

Create Patterns Once Deploy Anywhere



Smarter Process

Business Analytics



DevOps

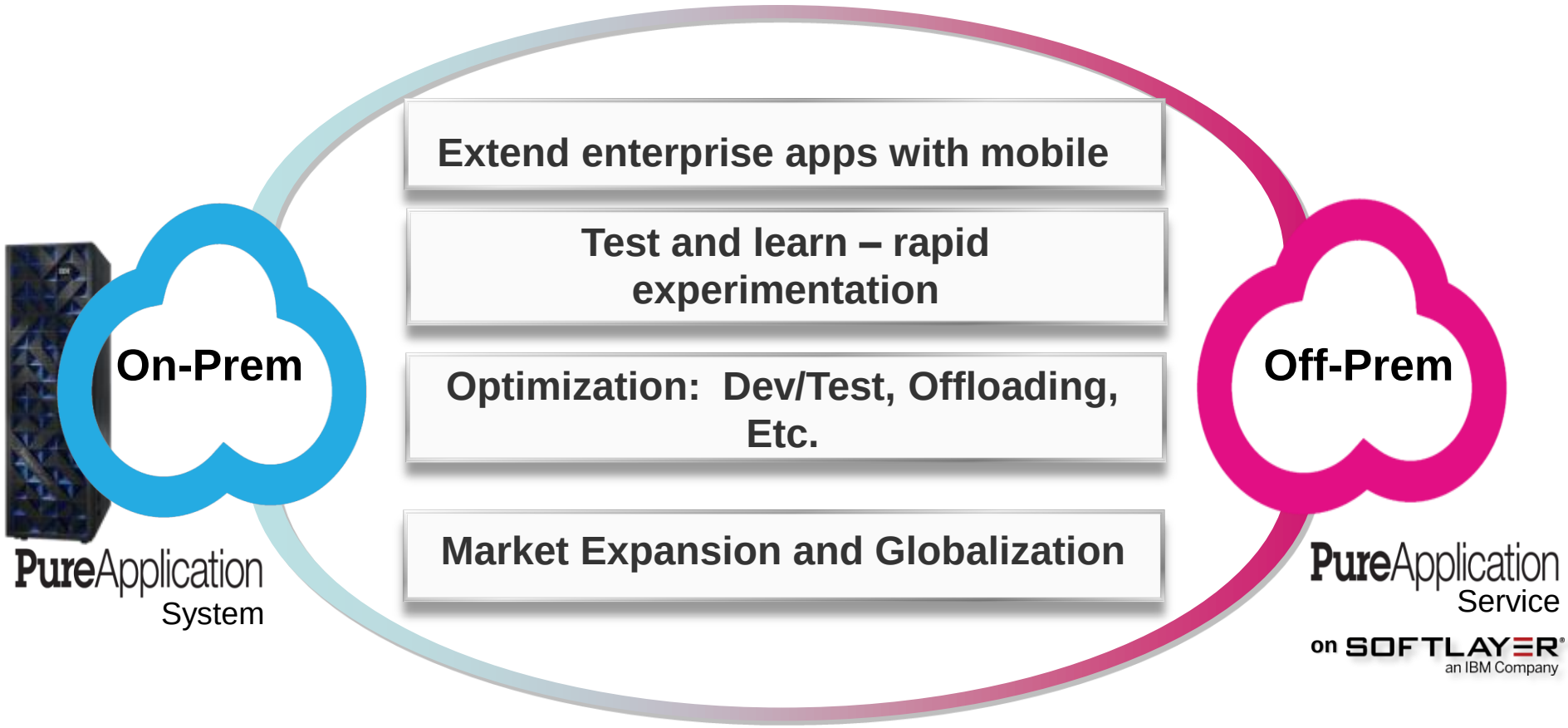
Mobile

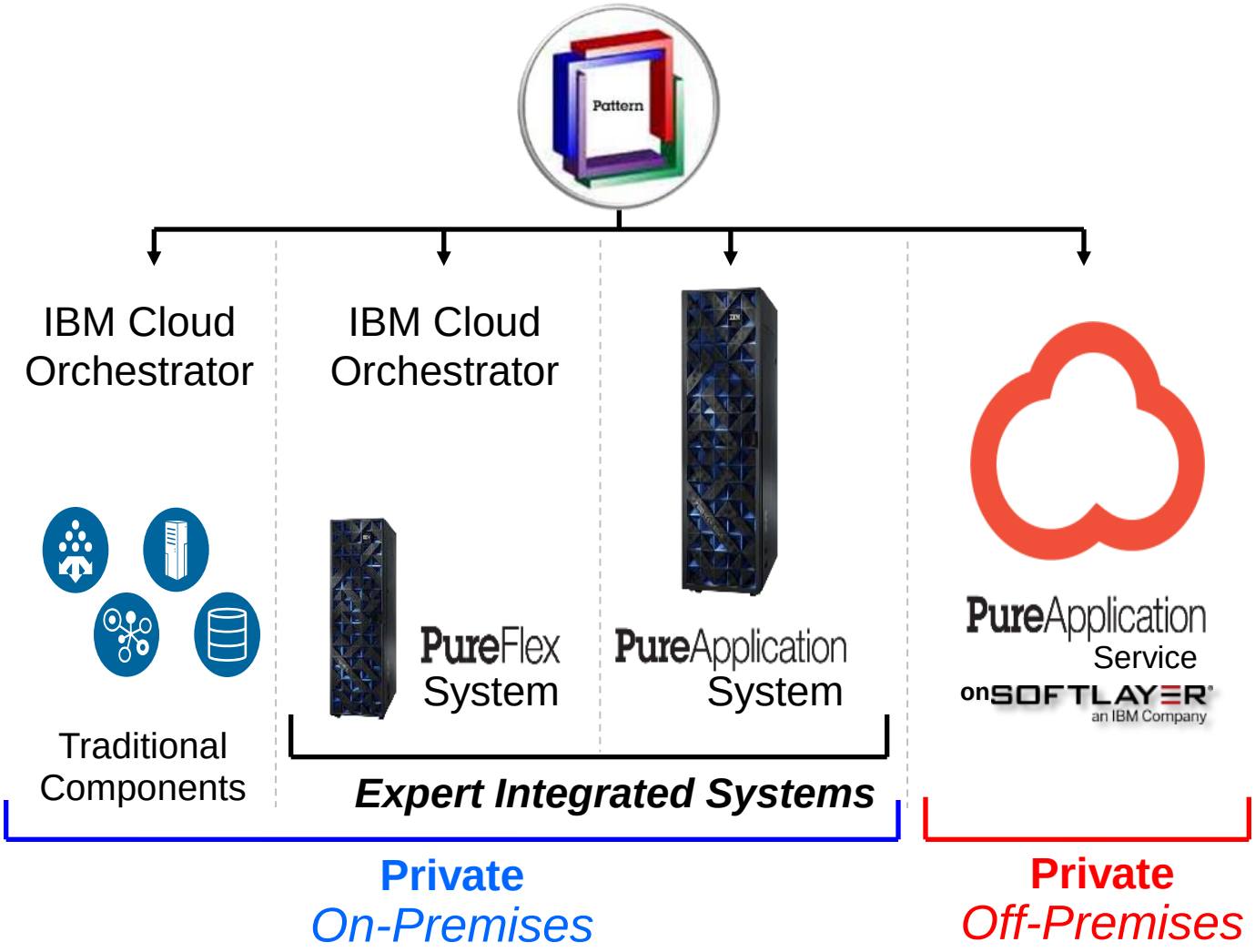
Social

Big Data

...

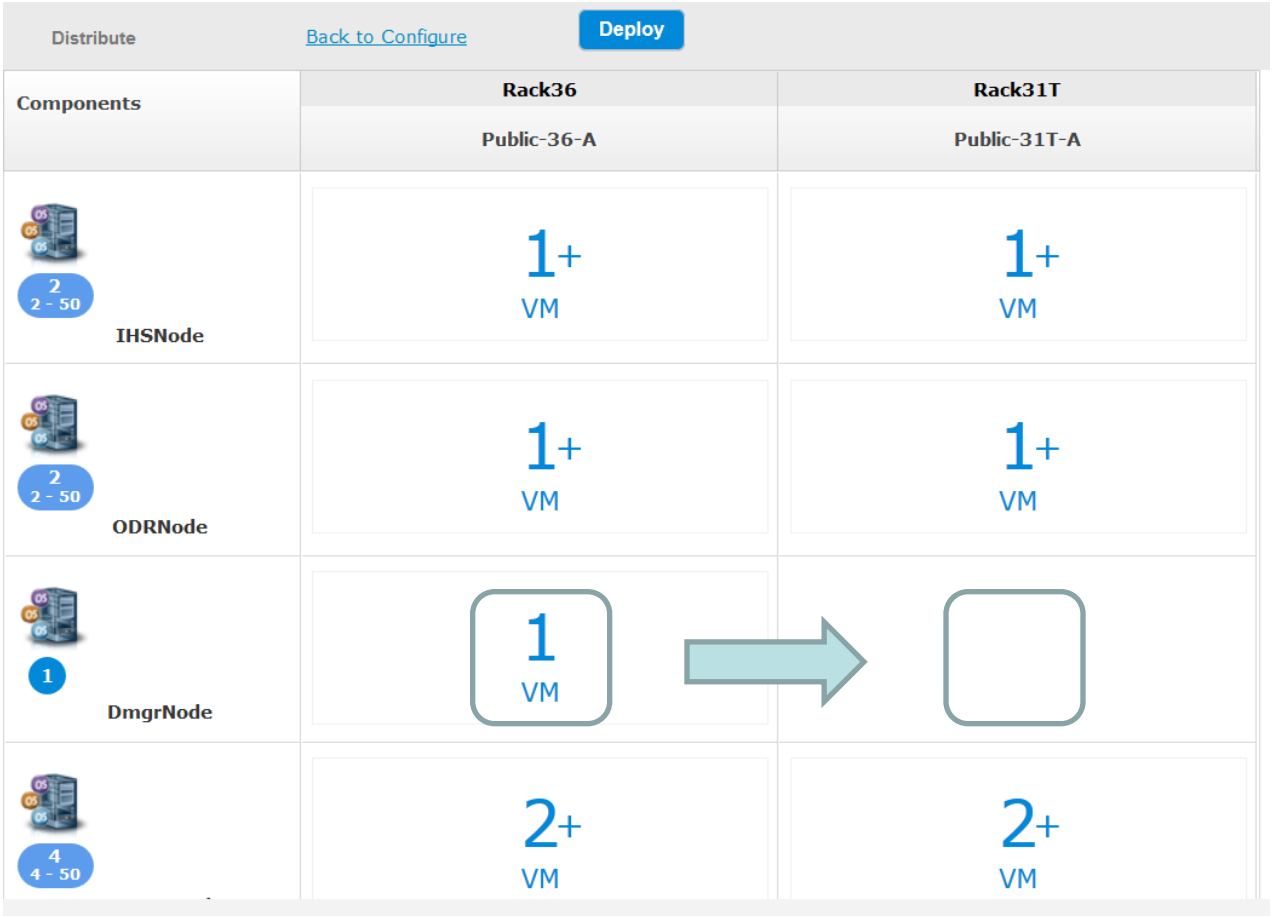
Using Hybrid Cloud Options Together Strategically





Deploying across multiple systems in a subdomain

Drag and drop virtual machines to deploy them across cloud groups and systems



Mission critical production support for an even broader set of apps!

- Deliver **continuous availability** for key applications by deploying **across multiple systems**
- **Add storage** with an external SAN Volume Controller
- Achieve **disaster recovery** for key applications by **replicating select segments of storage**
- Run your patterns on premise or in **hybrid cloud** through **SoftLayer**, IBM's industry leading public cloud
- Customize patterns to meet your IT standards with updated **PureApplication Pattern Engine**
- **Backup your workload data** with your backup and restore solution of choice with IBM Endpoint Manager Lifecycle Edition
- Call-Home delivers **easier system troubleshooting**

Pure and Simple.

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PureSystems Technical Sales

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धन्यवाद
Hindi

多謝
Traditional Chinese

Grazie
Italian

ขอบคุณ
Thai

Gracias
Spanish

Merci
French

Спасибо
Russian

شكراً
Arabic

Obrigado
Brazilian Portuguese

Danke
German

多谢
Simplified Chinese

நன்றி
Tamil

ありがとうございました
Japanese

감사합니다
Korean