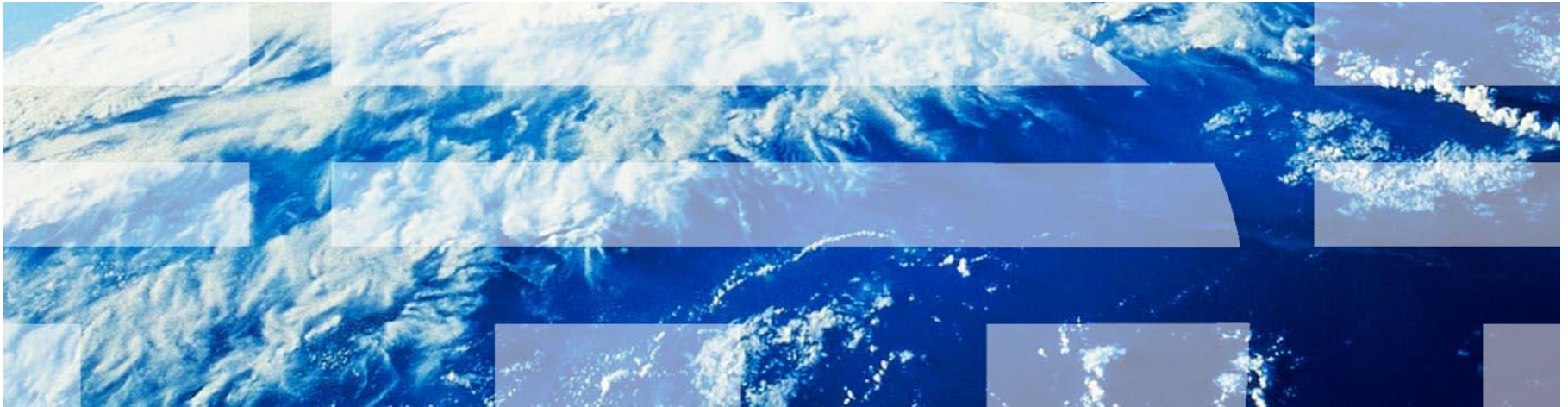


Enabling Hybrid Cloud with PureApplication - Second Generation



Claudio Tag

PureSystems Technical Sales

claudio.tag@uk.ibm.com

Agenda


■ Why Cloud?

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



Why using cloud?

A change of vocabulary:

Months  **Minutes**

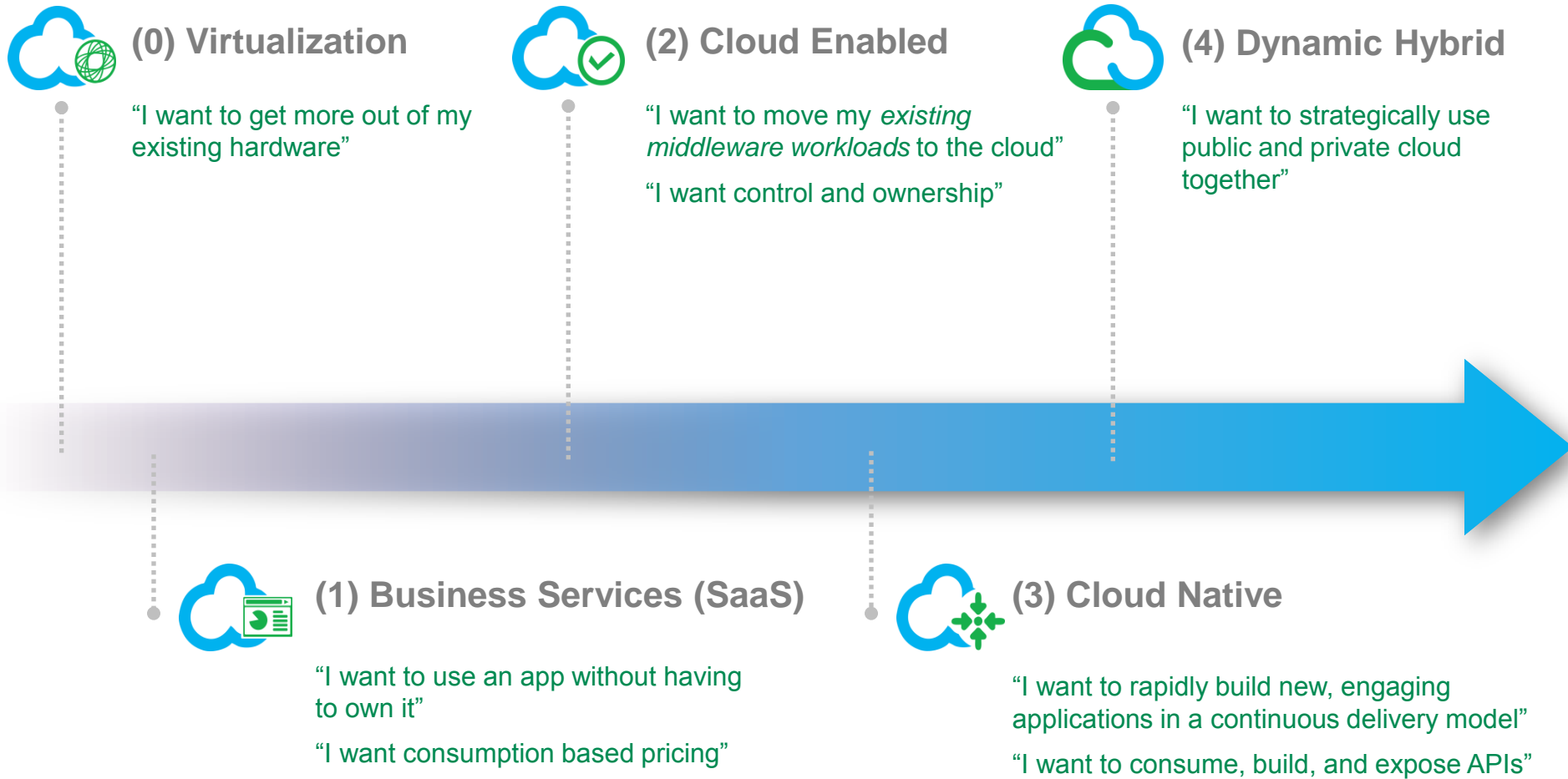
A change of mindset:

“Heroics don’t scale”

A change of approach:

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

Progressing Through the Cloud Maturity Model



IBM's patterns of expertise

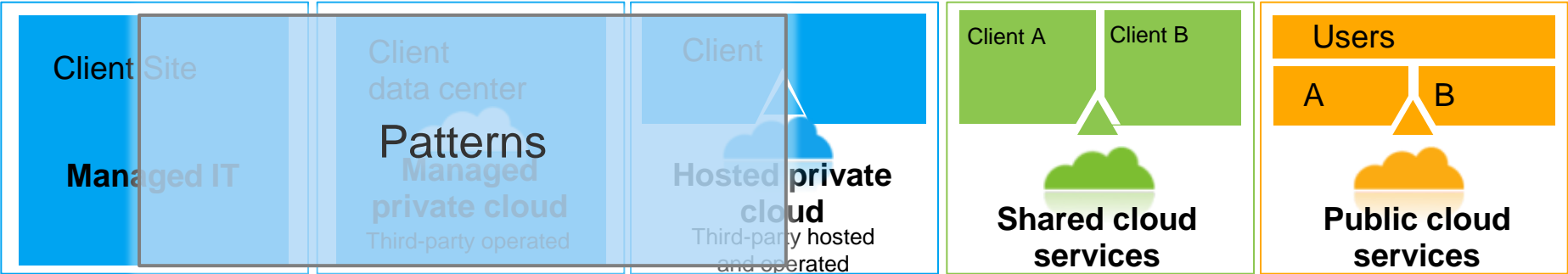
On Premise

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



Agenda

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



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

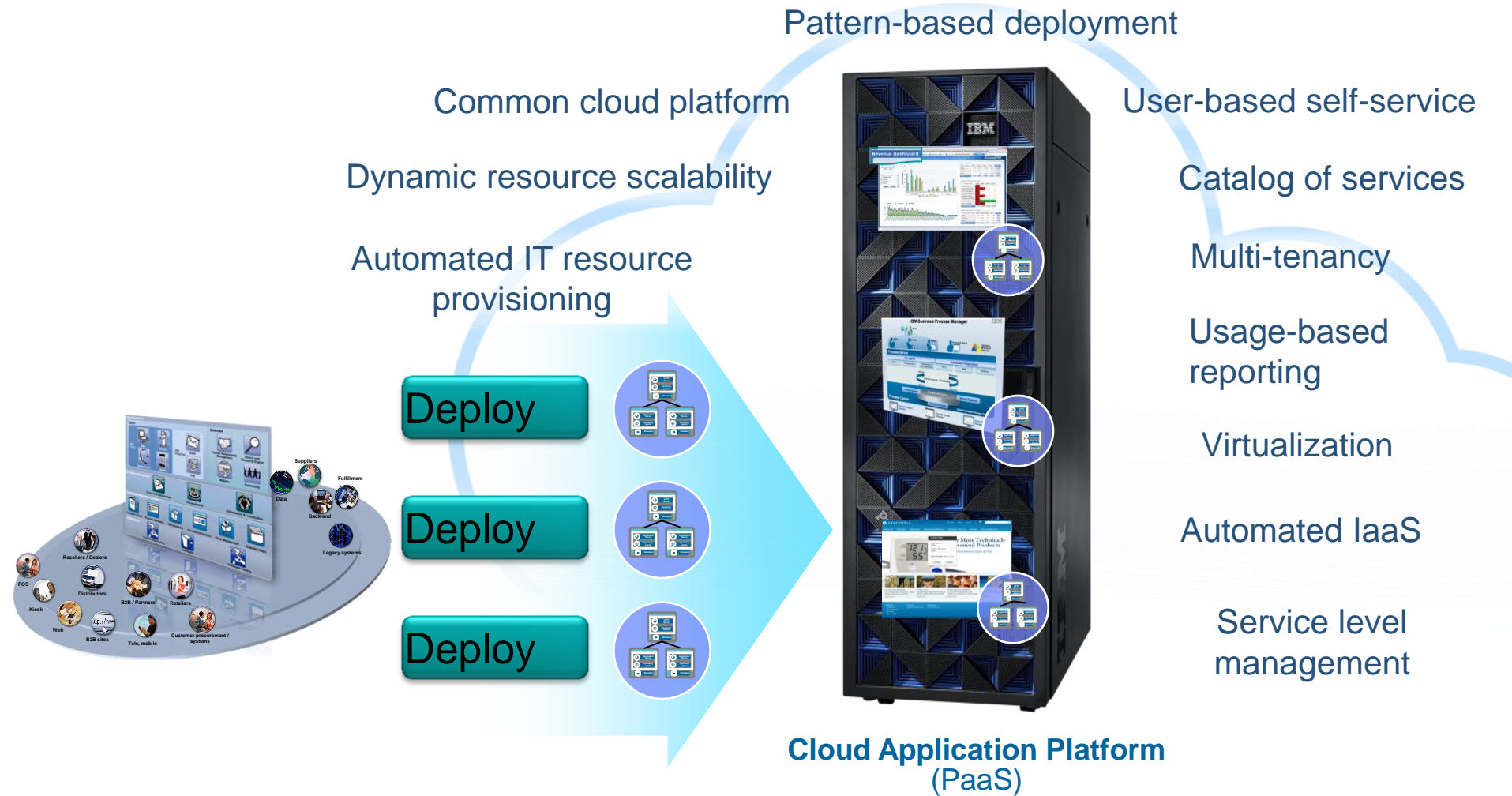
- Application Optimization
- System wide Management
- Automation & Scaling
- Caching & Elasticity
- Application Centric Provisioning
- Usage Metering
- Security
- Monitoring
- App Lifecycle Management
- License Management
- Self-service
- Data management

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



Agenda

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- Second Generation Hardware
- Second Generation Firmware
- Hybrid Cloud



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:

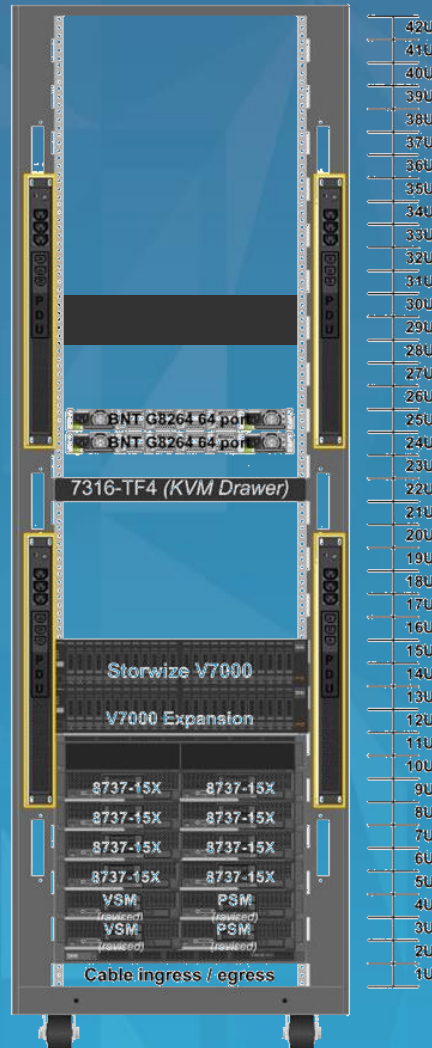
- V7000
- 2.4 TB SDD
- 24 TB HDD

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:

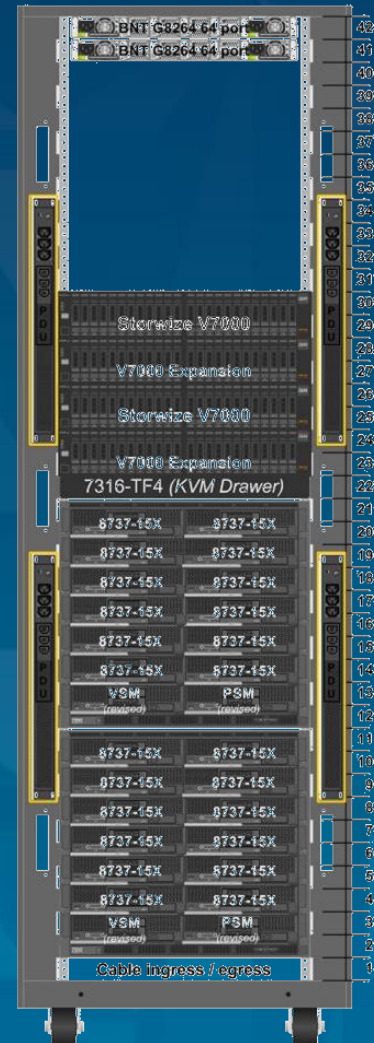
- V7000
- 6.4 TB SDD
- 48 TB HDD

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**



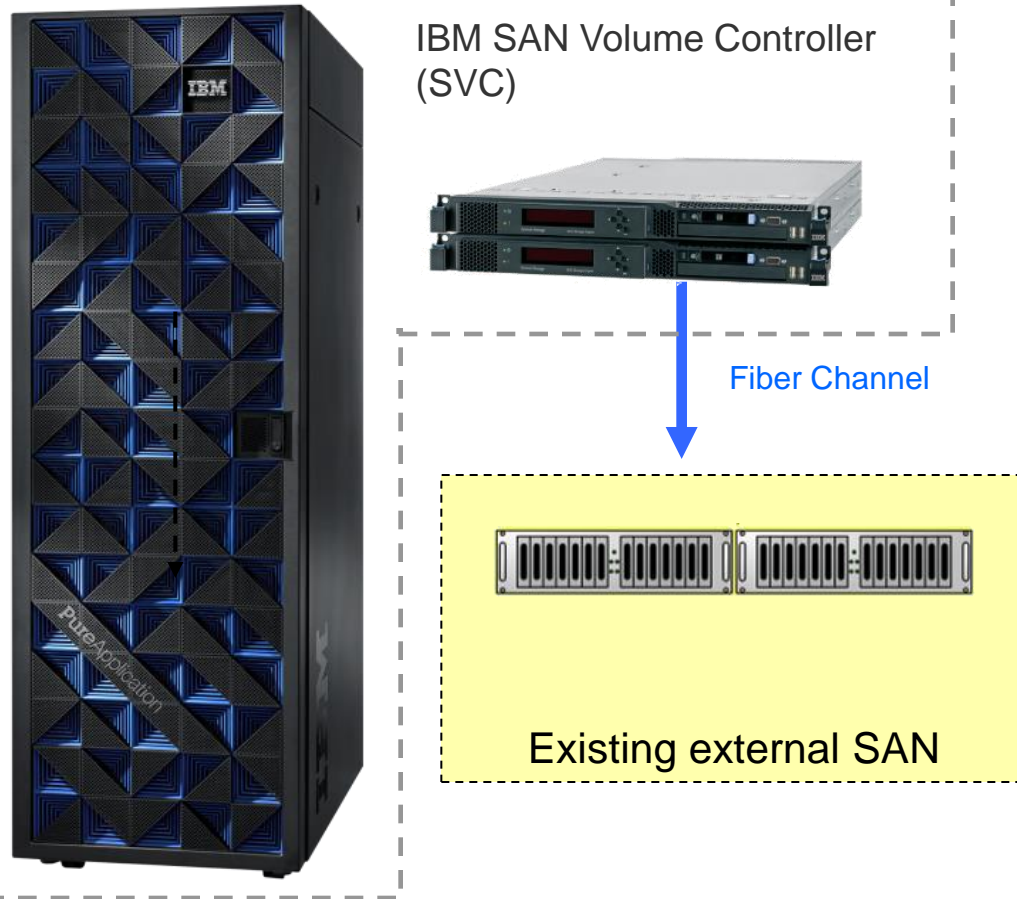
384 Cores
12 TB RAM

- 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**

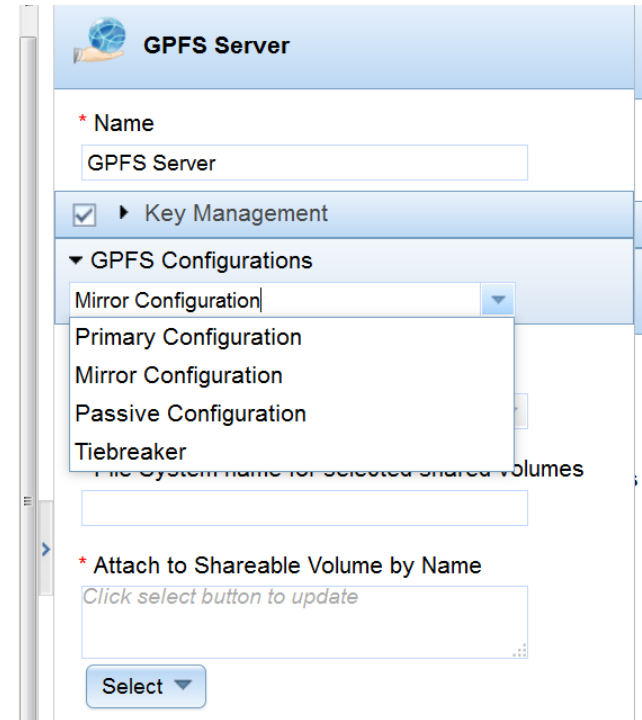
External storage support via fiber channel



- 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

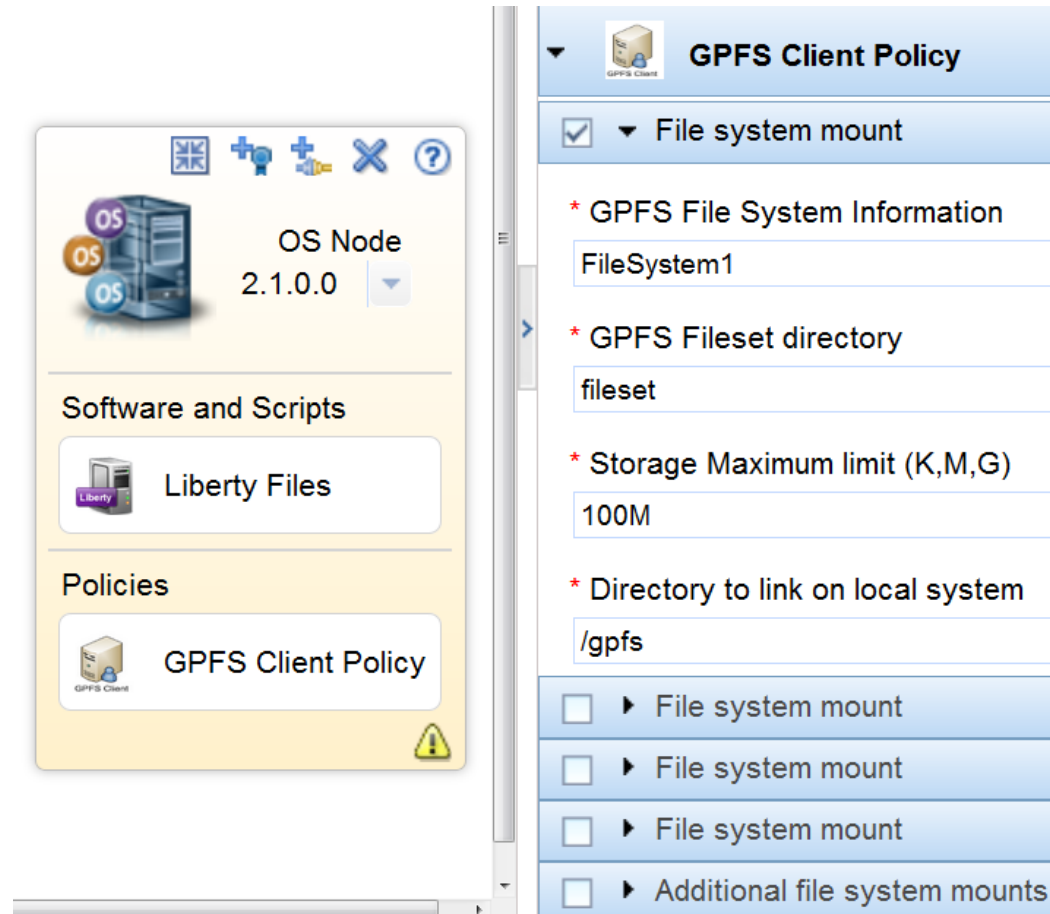
General parallel file system (GPFS) support

- GPFS server
 - Single virtual application
 - Administrator:
 - Creates storage
 - Chooses the configuration
 - Deploys the pattern
 - Maintenance and management provided by the pattern
- GPFS shared service used to connect to the GPFS server
 - Simplifies client connection

A screenshot of the GPFS Server configuration web interface. The title bar says "GPFS Server". Below it, there's a field for "Name" with the value "GPFS Server". A checkbox for "Key Management" is checked. Under "GPFS Configurations", a dropdown menu is open, showing options: "Mirror Configuration" (selected), "Primary Configuration", "Passive Configuration", and "Tiebreaker". Below the dropdown is a text field labeled "The system name for selected shared volumes". Further down, there's a section "Attach to Shareable Volume by Name" with a text field containing the instruction "Click select button to update" and a "Select" button.

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



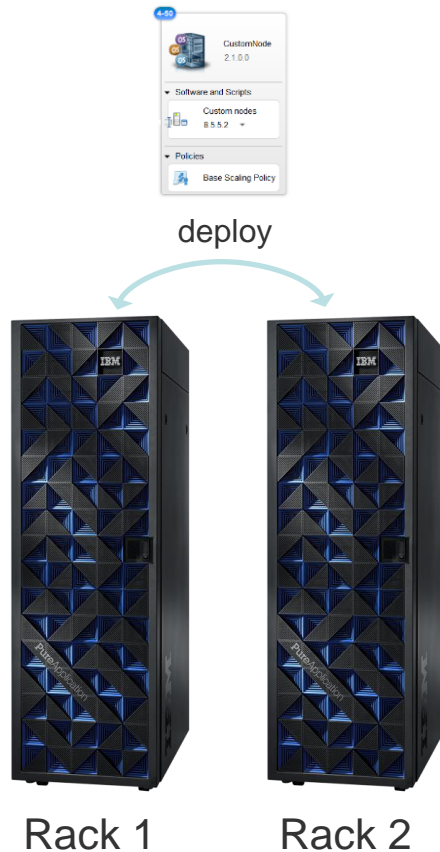
Agenda

- Why Cloud?
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- Second Generation Hardware
- Second Generation Firmware
- Hybrid Cloud



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

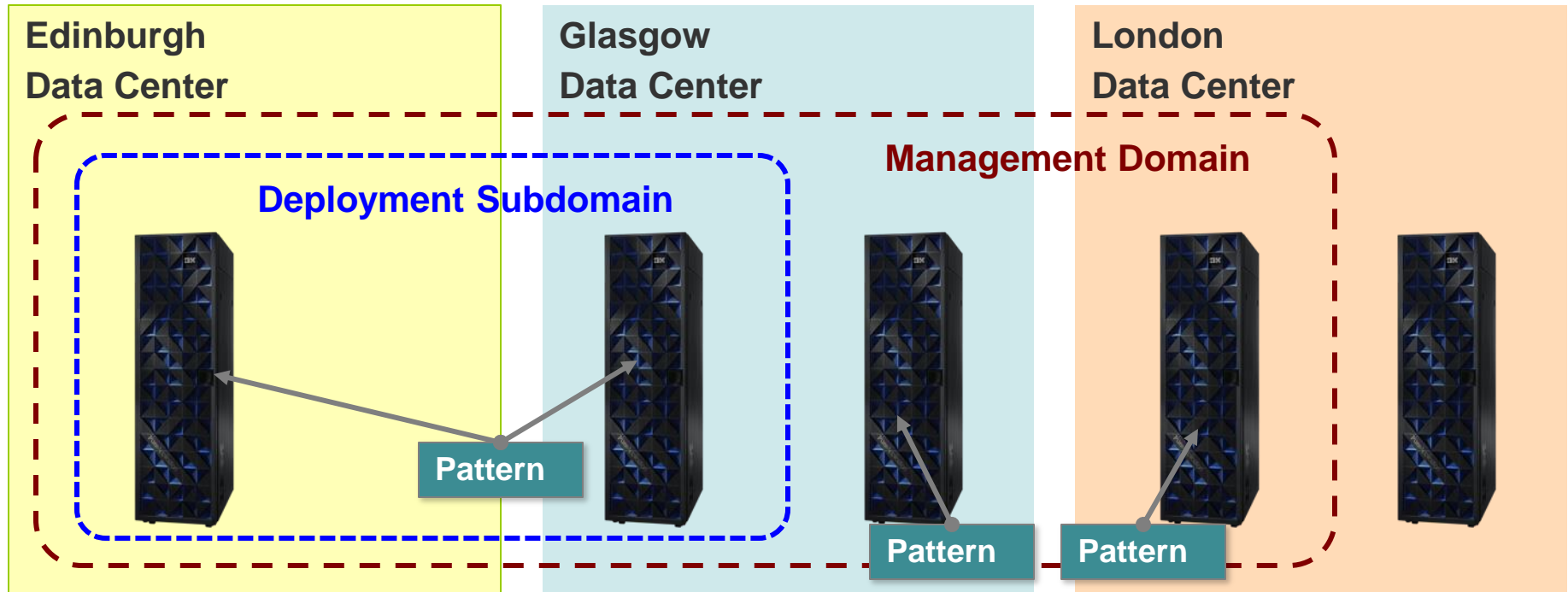
4

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

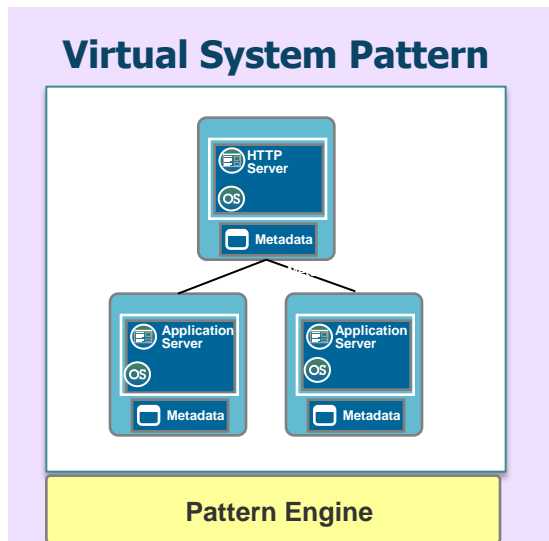
Drag and drop virtual machines to deploy them across cloud groups and systems

Distribute Back to Configure Deploy		
Components	Rack36	Rack31T
	Public-36-A	Public-31T-A
 2 2 - 50 IHSNode	1+ VM	1+ VM
 2 2 - 50 ODRNode	1+ VM	1+ VM
 1 DmgrNode	1 VM	
 4 4 - 50	2+ VM	2+ VM

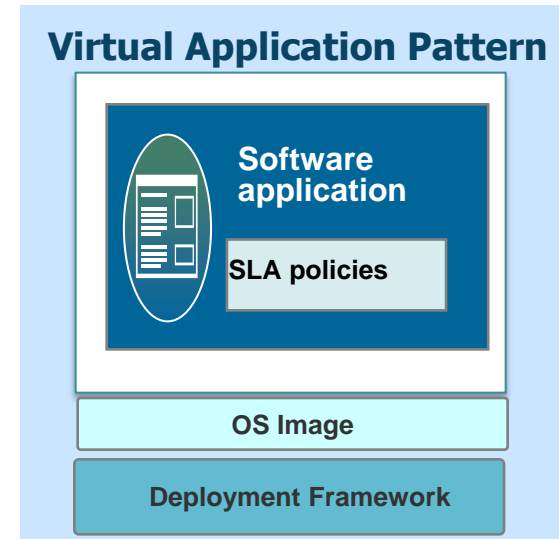
Enhanced pattern engine

Classic deployment models

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



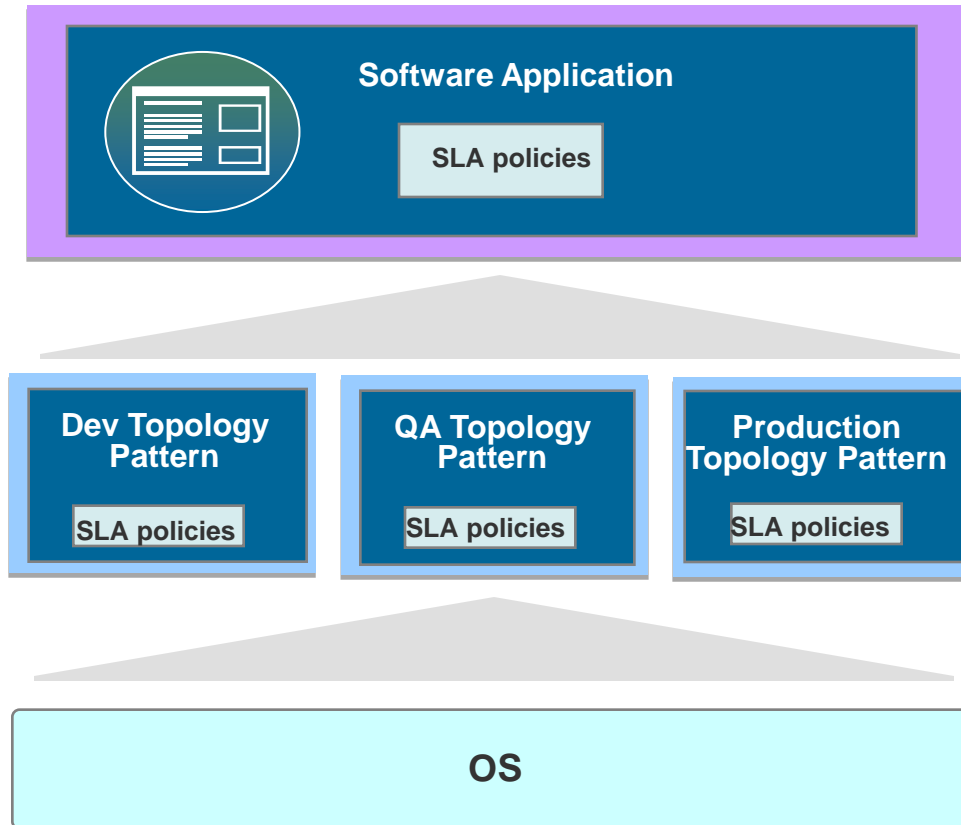
- Automated deployment of middleware topologies
- Traditional administration and management model
- Application and infrastructure driven elasticity



- Highly automated deployments using expert patterns
- Business policy driven elasticity
- Leverages elastic workload management services



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

The screenshot displays the IBM PureSystems Pattern Builder interface for configuring a 'WAS cluster pattern'. The interface includes a top menu bar with 'Diagram', 'Ordering', 'List View', and 'Source' tabs. Below the menu is a toolbar with 'Save', 'Save As', 'Layout', 'Undo', and 'Redo' buttons. On the left, an 'Assets' panel lists various components like 'debug', 'Images', 'Scripts', and 'Software Components'. The main workspace shows a diagram of the pattern with several nodes: 'DB2' (2.0.0.4), 'Deployment Manager' (2.0.0.4), 'Custom Node' (2.0.0.4), 'HTTP Server' (2.0.0.4), and 'IBM HTTP servers' (8.5.5.2). Each node has a 'Software and Scripts' section. The 'DB2' node's 'Software and Scripts' section is highlighted with an orange box, showing 'DB2 Server' (10.1.0.2) and 'Create Database' (1.0). The 'Deployment Manager' node's 'Software and Scripts' section shows 'Deployment manager' (8.5.5.2) and 'Create Datasource' (1.0). The 'Custom Node' node's 'Software and Scripts' section shows 'Custom nodes' (8.5.5.2). The 'HTTP Server' node's 'Software and Scripts' section shows 'IBM HTTP servers' (8.5.5.2). On the right, a 'Base Scaling Policy' panel is visible, showing settings for 'Number of Instances' (3), 'Instance number range of scaling in/out' (Range: 3 - 10), 'Maximum vCPU count per virtual machine' (Value: 2), 'Maximum memory size per virtual machine (GB)' (Value: 12), and 'CPU-based' scaling (Scaling in and out when CPU usage is out of threshold range(%), Range: 10% - 80%, Minimum time (seconds) to trigger add or remove: 300).

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

Building custom pattern components for virtual applications

IBM Workload Deployer

cbadmin

Help

About

Log Out

Welcome

Instances

Patterns

Catalog

Reports

Cloud

System

Components

Filter...

Web Application Pattern Type 2.0

Application Components

abcd.

Additional archive file

EAR

Enterprise Application
WebSphere Application Server

Existing Web Service Provider End

LibertyPC

PCTest

Policy set

Tradelite_MultiNode_PC

Export

Delete

Pattern types:

Web Application Pattern Type

Category:

Application Components

Application component:

Tradelite_MultiNode_PC

Policy definitions:

Environment Target

production

multinode

development

Actions:

Deploy

Deploy

Deploy

Targets:

Tradelite_Topology_Pattern-Liberty8500

Sample Java EE Web application - Multinode

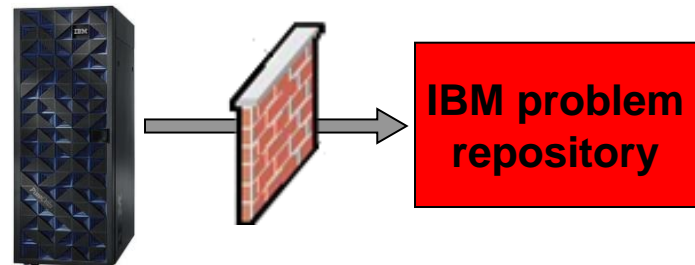
Sample Java EE Web application

© 2014 IBM Corporation

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

IBM PureApplication System
Workload Console
System Console
admin | Help | Log Out

Welcome
Cloud
Hardware
Reports
System

Problems

Problem text
Status: All
Component serial number

Problem text	Status	Severity	Component serial number	Service Ticket	Created on	Updated on	Actions
TEST COMPASS NSCHAMBU 14 swTempExceedThreshold	Open	2	1		Mar 21, 2014, 12:02:56 PM	Mar 21, 2014, 12:02:57 PM	
CWZIP1110 Failure writing to the internal management database: (DB2 SQL Error: SQLCODE=-302, SQLSTATE=22001, SQLERRMC=null, DRIVER=3.64.106)	Open	2	23AGLM2		Mar 20, 2014, 7:51:16 AM	Mar 20, 2014, 7:51:16 AM	
CWZIP9602W The state of Service53 is failed offline at node 23AGLM2.	Open	2	23AGLM2		Mar 20, 2014, 7:43:26 AM	Mar 20, 2014, 7:43:26 AM	
CWZIP9001E An unexpected internal error [Database:GlobalException] has occurred.	Open	2	23AGLM2	12021,999,000	Mar 18, 2014, 6:01:58 PM	Mar 18, 2014, 6:02:17 PM	
CWZIP9001E An unexpected internal error [Listener:GlobalException] has occurred.	Open	2	23AGLM2	12020,999,000	Mar 18, 2014, 6:01:58 PM	Mar 18, 2014, 6:02:16 PM	
CWZIP9602W The state of Service10 is failed offline at node 23AGLM2.	Open	2	23AGLM2	12019,999,000	Mar 18, 2014, 4:32:06 PM	Mar 18, 2014, 4:32:26 PM	
CWZIP9602W The state of Service33 is failed offline at node 23AKEW3.	Open	2	23AKEW3		Mar 18, 2014, 11:13:41 AM	Mar 18, 2014, 11:13:42 AM	
CWZIP9602W The state of Service50 is failed offline at node 23AGLM2.	Open	2	23AGLM2	12017,999,000	Mar 18, 2014, 2:20:07 AM	Mar 18, 2014, 2:20:32 AM	

Total: 15
1 2

Links to IBM Web PMR tool

PMRs detail page in the system console

Comments to help administrator keep track of actions (does not update PMR)

Allows administrators to add additional files and load them to the PMR

IBM PureApplication System

Welcome Cloud Hardware Problems

admin | Help | Log Out

Problem text

Problem text	Status
TEST COMPASS NSCHAMBU 14 swTempExceedThreshold	Open
CWZIP1110 Failure writing to the internal management database: (DB2 SQL Error: SQLCODE=-302, SQLSTATE=22001, SQLERRMC=null, DRIVER=3.64.106)	Open
CWZIP9602W The state of Service53 is failed offline at node 23AGLM2.	Open
CWZIP9001E An unexpected internal error [Database:GlobalException] has occurred.	Open
CWZIP9001E An unexpected internal error [Listener:GlobalException] has occurred.	Open
CWZIP9602W The state of Service10 is failed offline at node 23AGLM2.	Open
CWZIP9602W The state of Service33 is failed offline at node 23AKEW3.	Open
CWZIP9602W The state of Service50 is failed offline at node 23AGLM2.	Open

Total: 15

CWZIP9001E An unexpected internal error [Database:GlobalException] has occurred.

Service Ticket 12021,999,000

Status Open

Severity 2

Component type management_nodes

Component model 795502P

Component serial number 23AGLM2

Problem type IPASSW

More problem details

Message key: CWZIP9001E("[Database:GlobalException"])

Event text: CWZIP9001E An unexpected internal error [Database:GlobalException] has occurred.

Count: 1

Customer defined details: PureApplication General Event PureApplication Systems Manager : com.ibm.purescale.global.GlobalException: One Networking record was expected but 0 where found in table global_config

Original address: fd8c:215d:178e:c0de:5ef3:fcff:fe5f:764

Service Ticket History Total: 8

Notes

(None)

Add Note

Service ticket files

Rack Selected: PSM5-PSM6

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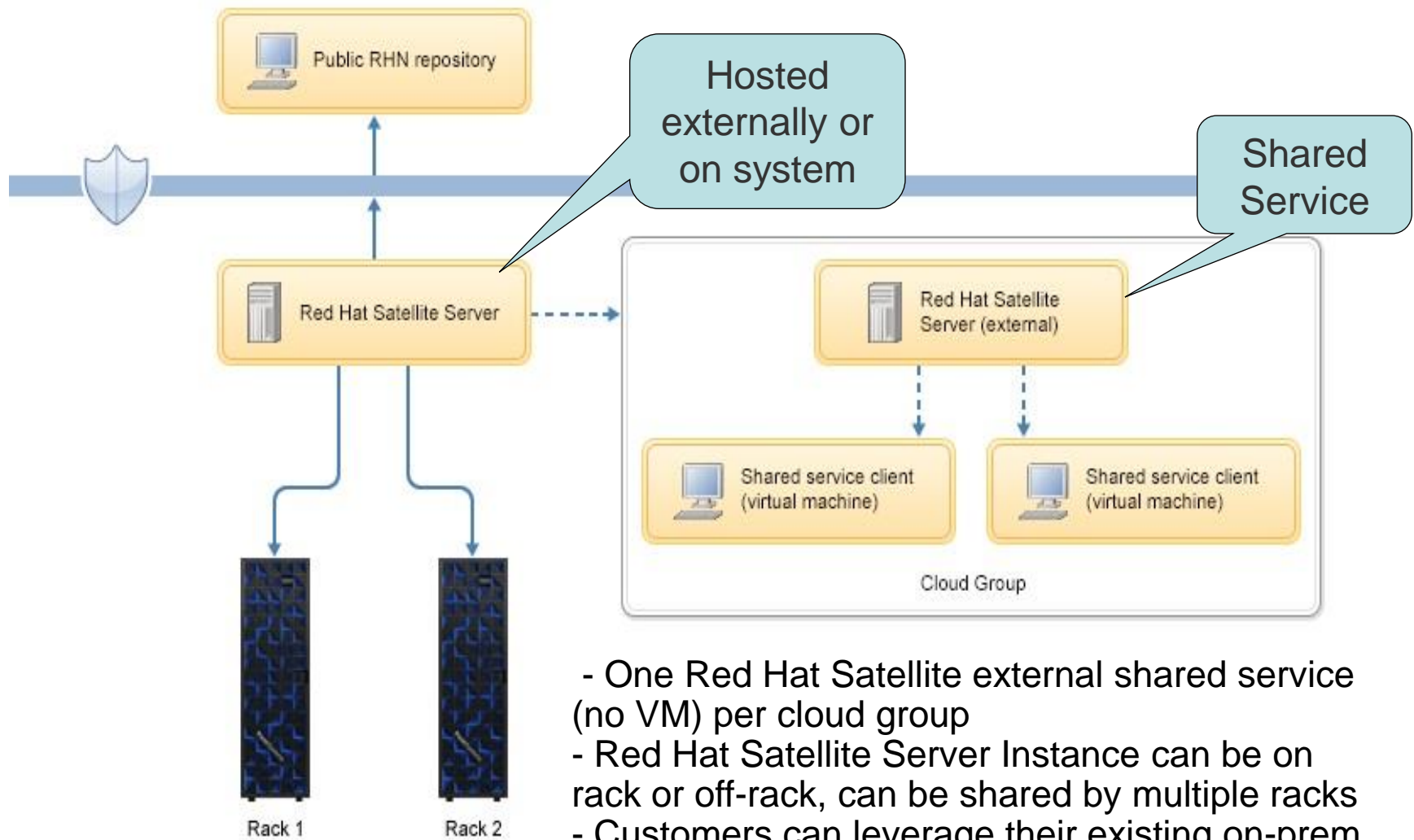
2.0.0.0-20140317-0131-526

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

Metrics:

CPU Hypervisor Memory Network Products Storage

☒ CPU Usage
☐ Virtual CPU Count

Metrics:

CPU **Hypervisor** Memory Network Products Storage

☐ Software Products
☐ Users With Access

Metrics:

CPU Hypervisor **Memory** Network Products Storage

☒ Memory Capacity
☐ Memory Usage

Metrics:

CPU Hypervisor Memory **Network** Products Storage

☐ IP Addresses

Metrics:

CPU Hypervisor Memory Network **Products** Storage

☒ PVU

Metrics:

CPU Hypervisor Memory Network Products **Storage**

☐ Storage Usage

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)

Agenda

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

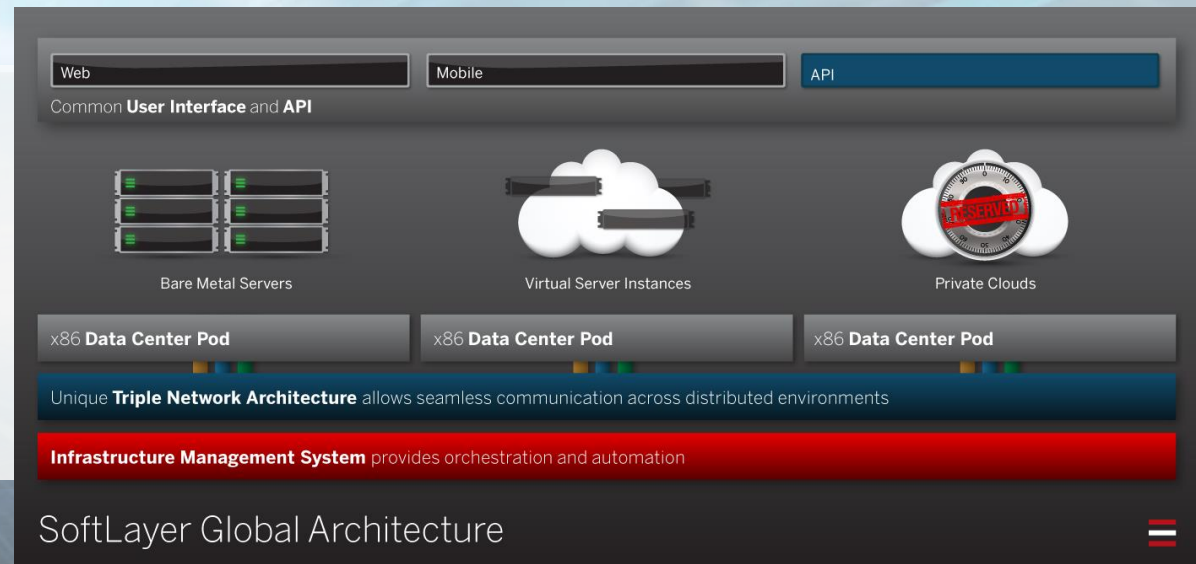


SoftLayer: A Global Cloud Leader

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*



PureApplication
Service on
SOFTLAYER®

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

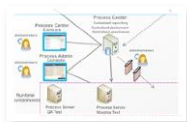
*Create Patterns Once
Deploy Anywhere*



Public Off-Premise



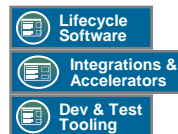
PureApplication
on **SOFTLAYER®**



Smarter
Process



Business
Analytics



DevOps



Mobile



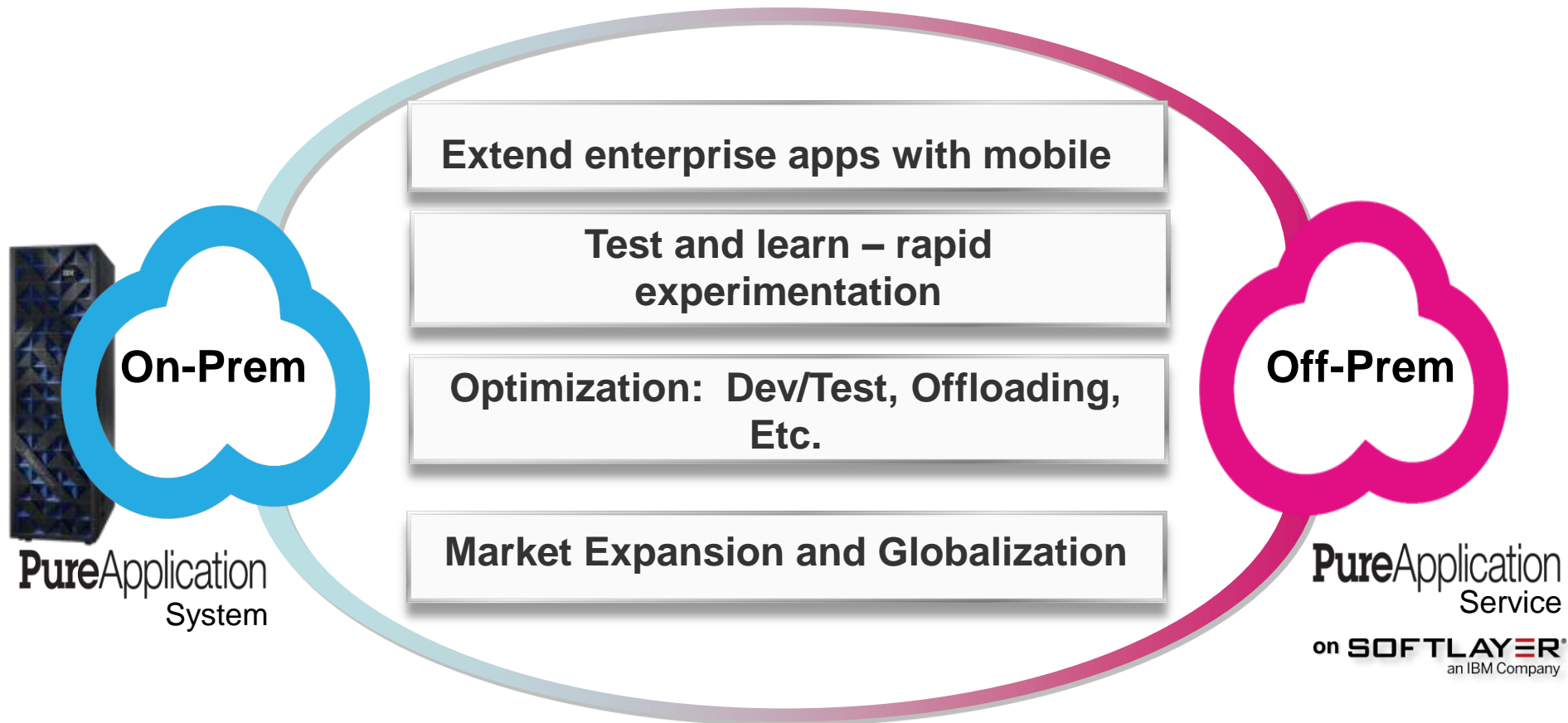
Social

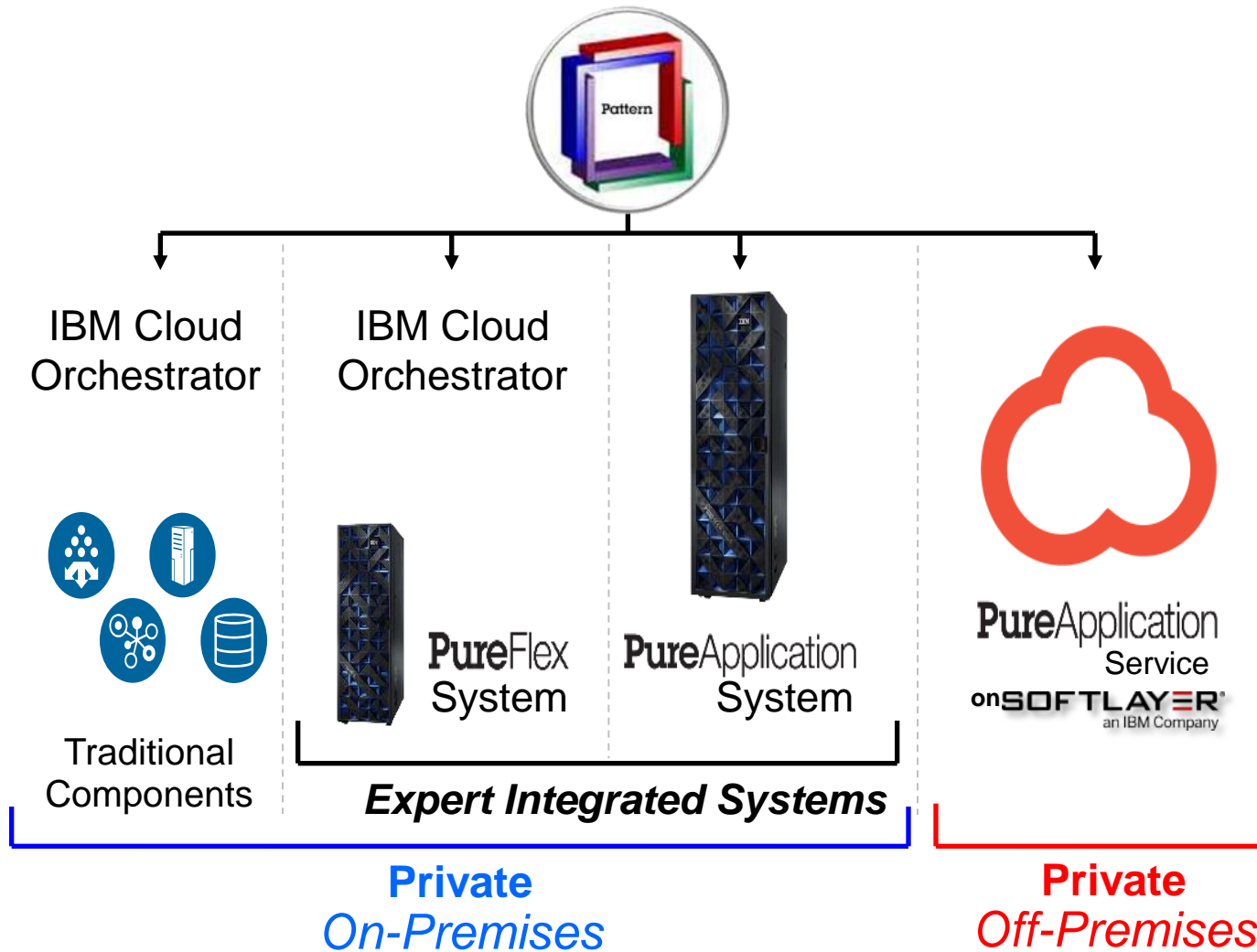


Big Data

...



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

Distribute Back to Configure Deploy		
Components	Rack36	Rack31T
	Public-36-A	Public-31T-A
 2 2 - 50 IHSNode	1+ VM	1+ VM
 2 2 - 50 ODRNode	1+ VM	1+ VM
 1 DmgrNode	1 VM	
 4 4 - 50	2+ VM	2+ VM

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.

धन्यवाद
Hindi

多謝
Traditional Chinese

Grazie
Italian

ขอบพระคุณ
Thai

Gracias
Spanish

Спасибо
Russian

Thank
You

Merci
French

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