IBM

MOVING IT FROM COMPLEX TO INTEGRATED

Jaqui Lynch
Andy Goade
Jeremy Wonson

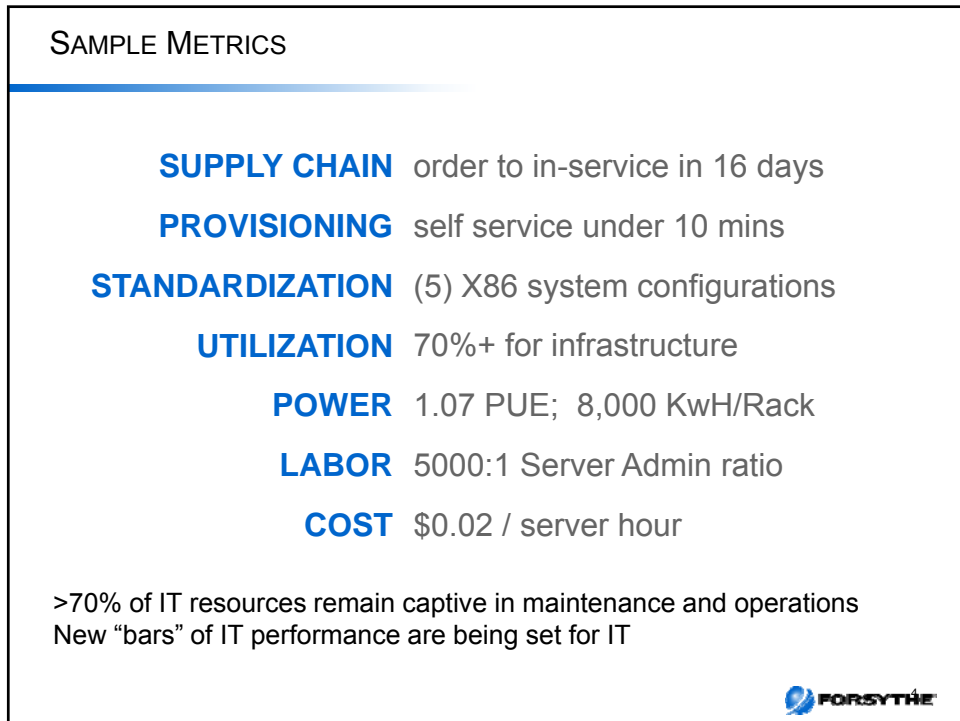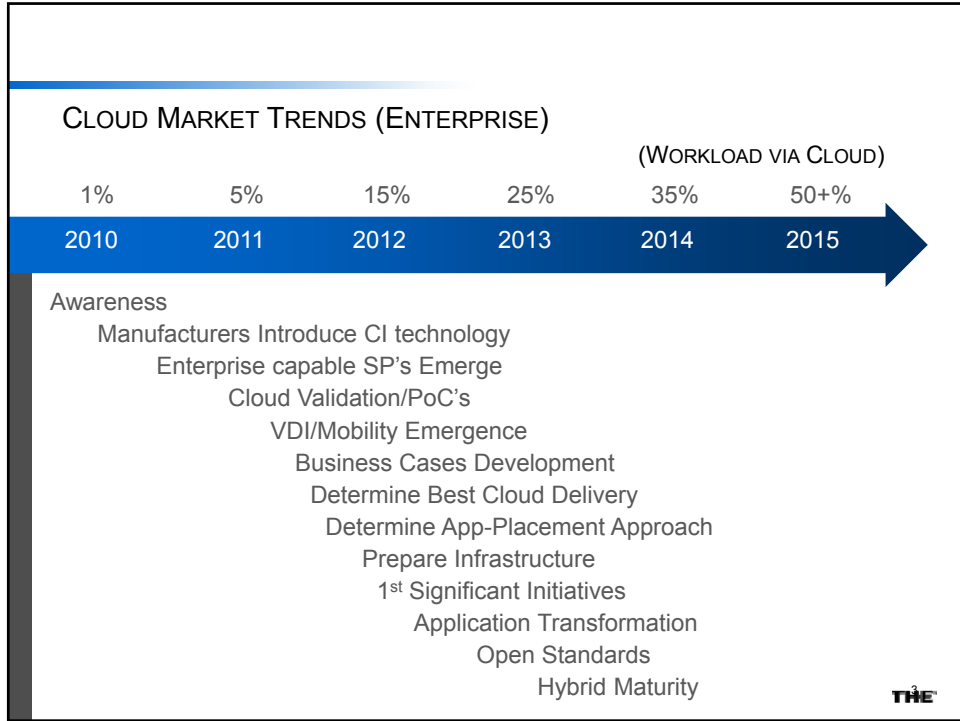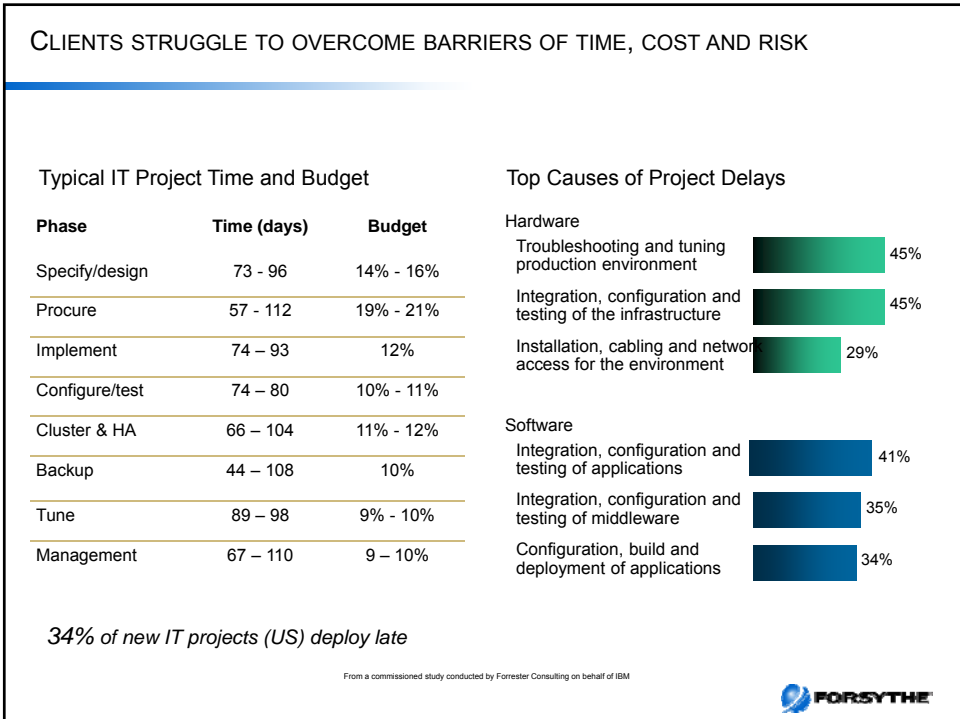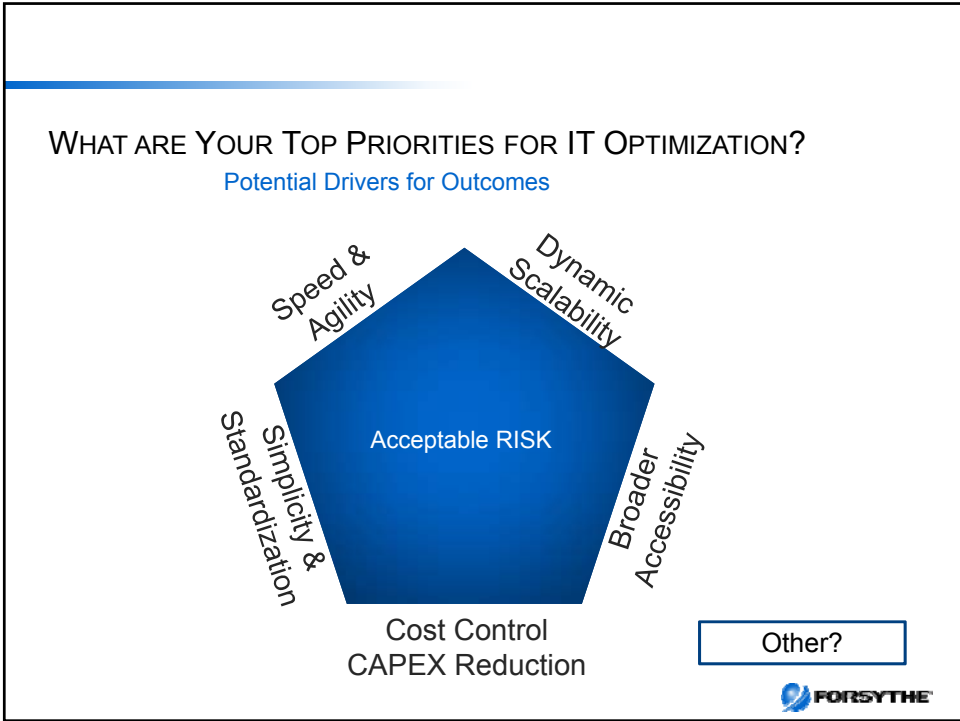FORSYTHE

AGENDA

- Introduction to Converged Infrastructures
    - Jeremy Wonson, Principal Architect
- The IBM View and Pure Systems
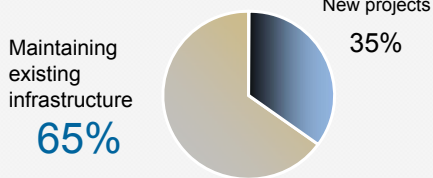   - Jaqui Lynch and Andrew Goade, Solutions Architects
- Questions

FORSYTHE

CLOUD MARKET TRENDS (ENTERPRISE)

(WORKLOAD VIA CLOUD)

1%	5%	15%	25%	35%	50+%
2010	2011	2012	2013	2014	2015

Awareness
Manufacturers Introduce CI technology
Enterprise capable SP's Emerge
Cloud Validation/PoC's
VDI/Mobility Emergence
Business Cases Development
Determine Best Cloud Delivery
Determine App-Placement Approach
Prepare Infrastructure
1st Significant Initiatives
Application Transformation
Open Standards
Hybrid Maturity

SAMPLE METRICS

SUPPLY CHAIN order to in-service in 16 days

PROVISIONING self service under 10 mins

STANDARDIZATION (5) X86 system configurations

UTILIZATION 70%+ for infrastructure

POWER 1.07 PUE; 8,000 KwH/Rack

LABOR 5000:1 Server Admin ratio

COST $0.02 / server hour

>70% of IT resources remain captive in maintenance and operations
New "bars" of IT performance are being set for IT

FORSYTHE

WHAT ARE YOUR TOP PRIORITIES FOR IT OPTIMIZATION?
Potential Drivers for Outcomes

Speed & Agility

Dynamic Scalability

Simplicity & Standardization

Acceptable RISK

Broader Accessibility

Cost Control
CAPEX Reduction

Other?

FORSYTHE

CLIENTS STRUGGLE TO OVERCOME BARRIERS OF TIME, COST AND RISK

Typical IT Project Time and Budget

Phase	Time (days)	Budget
Specify/design	73 - 96	14% - 16%
Procure	57 - 112	19% - 21%
Implement	74 – 93	12%
Configure/test	74 – 80	10% - 11%
Cluster & HA	66 – 104	11% - 12%
Backup	44 – 108	10%
Tune	89 – 98	9% - 10%
Management	67 – 110	9 – 10%

34% of new IT projects (US) deploy late

Top Causes of Project Delays

Hardware
- Troubleshooting and tuning production environment — 45%
- Integration, configuration and testing of the infrastructure — 45%
- Installation, cabling and network access for the environment — 29%

Software
- Integration, configuration and testing of applications — 41%
- Integration, configuration and testing of middleware — 35%
- Configuration, build and deployment of applications — 34%

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

FORSYTHE

ONLY 1 IN 5 CAN ALLOCATE MORE THAN HALF THEIR IT BUDGET TO INNOVATION

Least efficient data centers

Use of new technology:
43% first and fast technology adoption
1% move virtual machines to meet desired outcomes
21% use storage virtualization
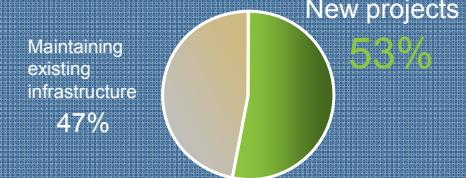3% use a storage service catalog (tiered storage)

Results:
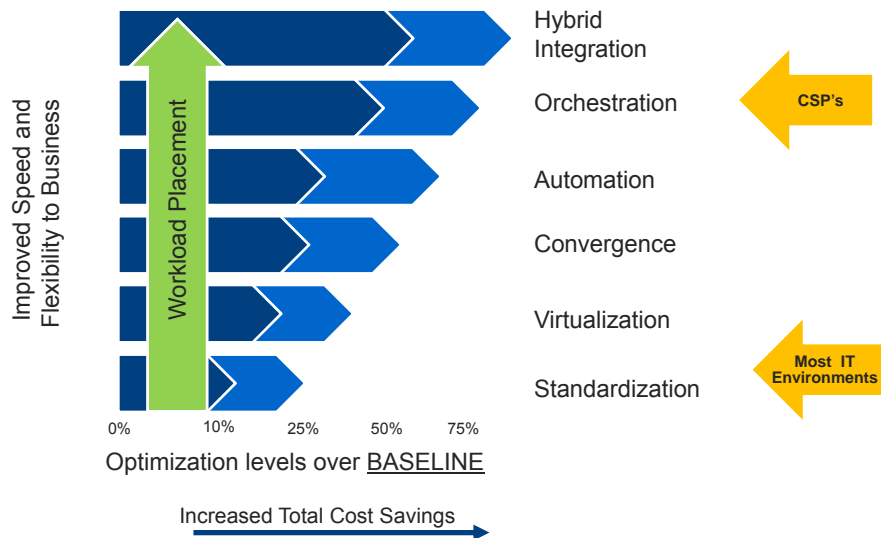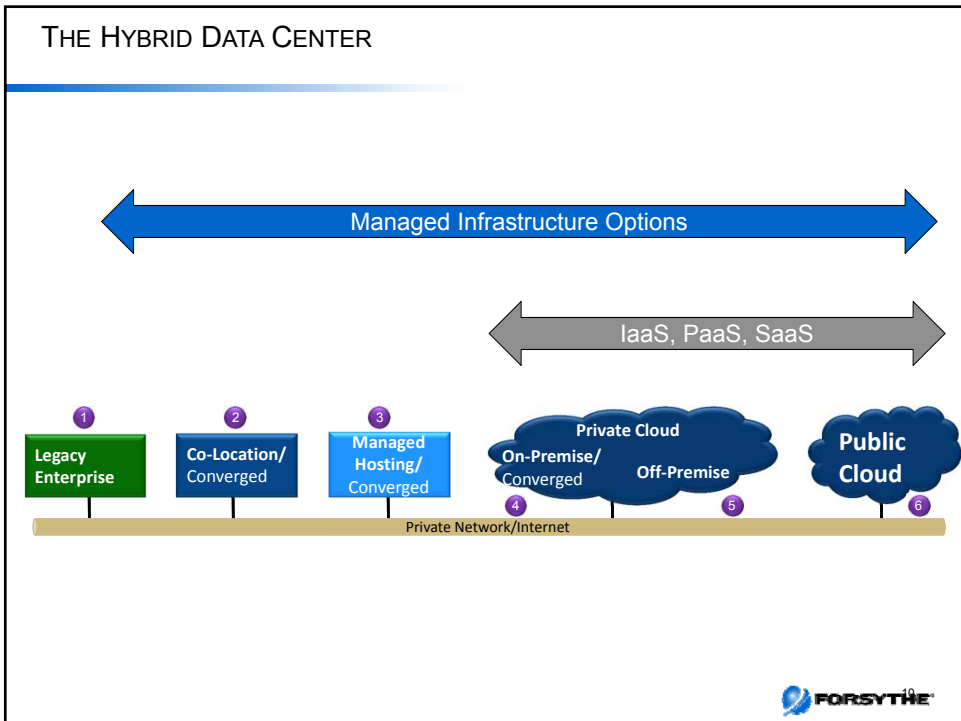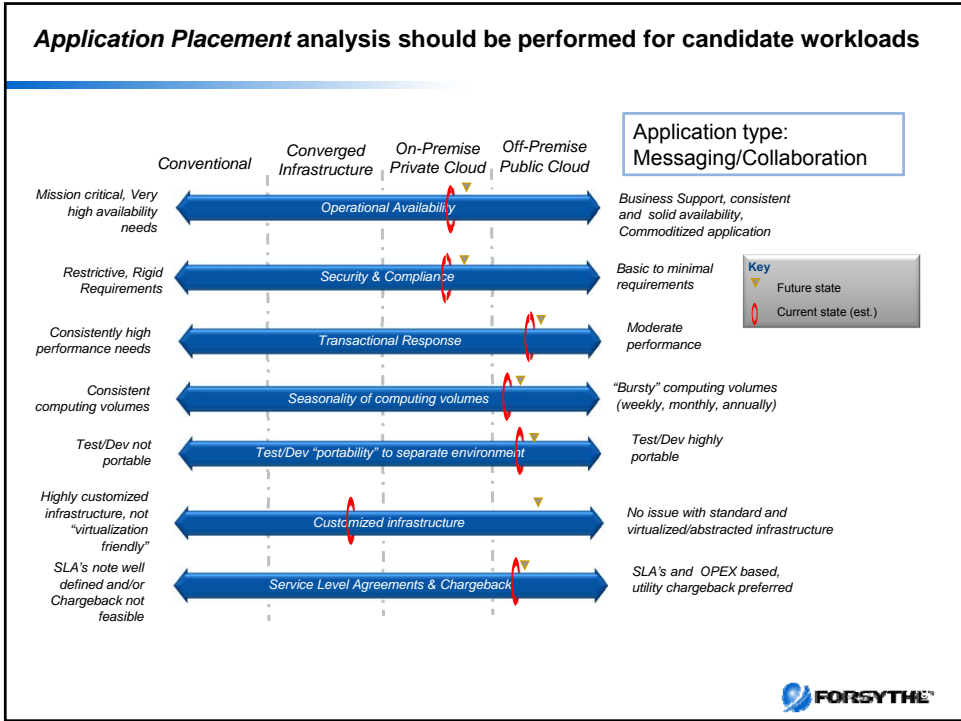
New projects
35%

Maintaining existing infrastructure
65%

Most efficient data centers

Use of new technology:
86% first and fast technology adoption
58% move virtual machines to meet desired outcomes
93% use storage virtualization
87% use a storage service catalog (tiered storage)

Results:

New projects
53%

Maintaining existing infrastructure
47%

Source: 2012 IBM Data Center Study: www.ibm.com/data-center/study (http://www.ibm.com/data-center/study)

FORSYTHE

A RADICAL FOCUS AND APPROACH IS NEEDED

Improved Speed and Flexibility to Business

Workload Placement

Hybrid Integration

Orchestration — CSP's

Automation

Convergence

Virtualization

Standardization — Most IT Environments

0%   10%   25%   50%   75%

Optimization levels over BASELINE

Increased Total Cost Savings

FORSYTHE

Application Placement **analysis should be performed for candidate workloads**

	Conventional	Converged Infrastructure	On-Premise Private Cloud	Off-Premise Public Cloud	
Mission critical, Very high availability needs			Operational Availability		Business Support, consistent and solid availability, Commoditized application
Restrictive, Rigid Requirements			Security & Compliance		Basic to minimal requirements
Consistently high performance needs			Transactional Response		Moderate performance
Consistent computing volumes			Seasonality of computing volumes		"Bursty" computing volumes (weekly, monthly, annually)
Test/Dev not portable			Test/Dev "portability" to separate environment		Test/Dev highly portable
Highly customized infrastructure, not "virtualization friendly"			Customized infrastructure		No issue with standard and virtualized/abstracted infrastructure
SLA's note well defined and/or Chargeback not feasible			Service Level Agreements & Chargeback		SLA's and OPEX based, utility chargeback preferred

Application type: Messaging/Collaboration

Key
▼ Future state
⊘ Current state (est.)

FORSYTHE

THE HYBRID DATA CENTER

Managed Infrastructure Options

IaaS, PaaS, SaaS

1. Legacy Enterprise
2. Co-Location/ Converged
3. Managed Hosting/ Converged
Private Cloud
On-Premise/ Converged Off-Premise
Public Cloud

Private Network/Internet

FORSYTHE

5

Converged Infrastructure Criteria:

MANAGEMENT

VIRTUALIZATION

NETWORK

COMPUTE

STORAGE

- All required components in one platform or product
- Pre-engineered, validated, with physical and logical integration
- Roadmap planning, interoperability testing, change management and simplified upgrades
- Rapid / low effort installation and configuration services
- Unified, simplified support of entire platform / product

11

FORSYTHE
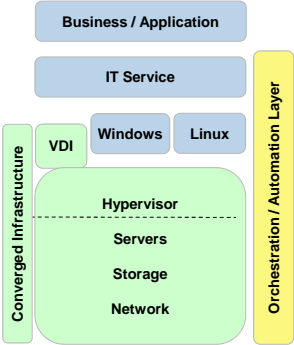
CONVERGED INFRASTRUCTURE – CONCEPTUAL DRAWING

Not Converged

Business / Application

IT Service

| VDI | Windows | Linux |

Hypervisor

| Server A | Server B |

| Storage A | Storage B |

Network

virtualization layer

hardware layer

Converged

Business / Application

IT Service

Converged Infrastructure

VDI | Windows | Linux

Hypervisor

Servers

Storage

Network

Orchestration / Automation Layer

12

FORSYTHE

Advantages

- Pre-Configured (Racked / Cabled / Basic Logical Configuration)
- Pre-Tested (Interoperability / Performance)
- Unified, Simplified Support Organization (Hypervisor / Hardware / Software)
- Bundled System Upgrades (Ensuring Future Interoperability and Performance)
- Built for Non-Disruptive Scalability
- Single Infrastructure Management Tool (for converged platform only)
- Built-in Efficiency (increased virtualization, automated storage tiering)

Results

- Faster Time To Market
- Reduced Risk of Downtime and Performance Issues
- Reduced Operational Complexity and Effort

FORSYTHE 13

TO DELIVER THE CORE VALUES YOU NEED
INTEGRATED EXPERTISE OVERCOMES TRADITIONAL HURDLES

From traditional	To PureSystems	Value delivered
Up and running in months	Complete infrastructure stack up-and-running in hours	Faster time to value
Over-purchase and provision	Built-in workload elasticity	Automated workload scalability
Multiple tools per component	Single point of management	Integrated service and software management
Piecemeal order and support of hardware and software	Complete, pre-integrated software and hardware	Simplified acquisition and support
Create custom solutions to work with what you have	Easy integration through open-standards computing	Integrated into current environment
Infrastructure complexity slows down change	Easily extendable and accommodating to change	Easily adapts to meet new needs
Multiple service points of contact and multiple updates	Single service point of contact and integrated updates	Improved lifecycle management

FORSYTHE

IBM PURE SYSTEMS AND INTEGRATION

THE LIFE OF AN IT MANAGER

Business Needs   Customer Needs   Resource constraints   IT needs

FORSYTHE

HOW DO WE GET FROM A TO B?

A

B

SIMPLIFY

IT COMPLEXITY LEADS TO

Fear   Frustration   Exhaustion

SO WHERE ARE WE GOING?
EVEN THE CONSULTANTS DON'T AGREE

Gartner 2009 Poll
- Linux and Windows on x86 will prompt a move away from UNIX
- Linux is the strategic *NIX of choice

Computerworld
- 90% managers said their companies are reliant on UNIX
- Only 12% planned to migrate from UNIX

Gabriel Consulting Group
- X86 Linux has taken over basics like file/print, web serving and some web application servers
- UNIX still the backbone
- UNIX systems are multiple workload versions of databases and apps that run the business
- If UNIX systems crash bad things happen
- 2009 survey – 91% claim UNIX is strategic and critical to functioning

---
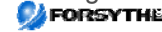
A NEW ERA FOR INFORMATION TECHNOLOGY

Process-Centric era
- Business processes automation
- Focused on bottom-line improvement through SG&A reduction
- Typically long business cycle
- Terabytes of largely structured data

Information-Centric era
- Real-time pattern based action
- Focused on top-line growth through revenue acquisition
- Reactive for shorter product cycles
- Zettabytes of largely unstructured data

WHAT ARE TODAY'S PRESSURES AND REALITIES?

Consumerization
- Mobility
- Social business
- Iterative solutions

Business

Business Demands
- Address opportunities more quickly
- Drive business innovation
- Leverage technology more strategically

IT Needs
- Deliver new capabilities faster
- Shift resources from maintenance to transformation
- Control growing complexity

IT

FORSYTHE

Building custom systems is not sustainable

Up & Running

Specify/Design
Takes 30 days for an IT infrastructure system

Procure
Software & hardware ordered separately taking 5-20 days

Integrate
Components arrive as "bag of parts" – requiring optimization

Deploy
Can take weeks to months

Ongoing Effort

Customize/Tune
Meeting SLAs requires customization and ongoing tuning

Scale
Lack of dynamic elasticity results in cumbersome re-allocation of resources

Manage
Managing and monitoring with multiple tools is time consuming

Maintain
Separate fixes require separate testing

Upgrade
Months to plan, procure and test; days of downtime

Development Operations

Provision
Takes 30-60 days for a development or test environment

Configure
Modified and non-standard Dev/Test/Production configurations cause errors and delay production deployments by weeks

FORSYTHE

KEYS TO SURVIVAL

Key components
- Convergence
- Simplification
- Virtualization
- Single management point
- Orchestration and Deployment
- Automation
- Everything on demand
- Database and storage needs are not going to diminish

The key will be management software and right sizing
Customers looking for roadmaps for hardware and software
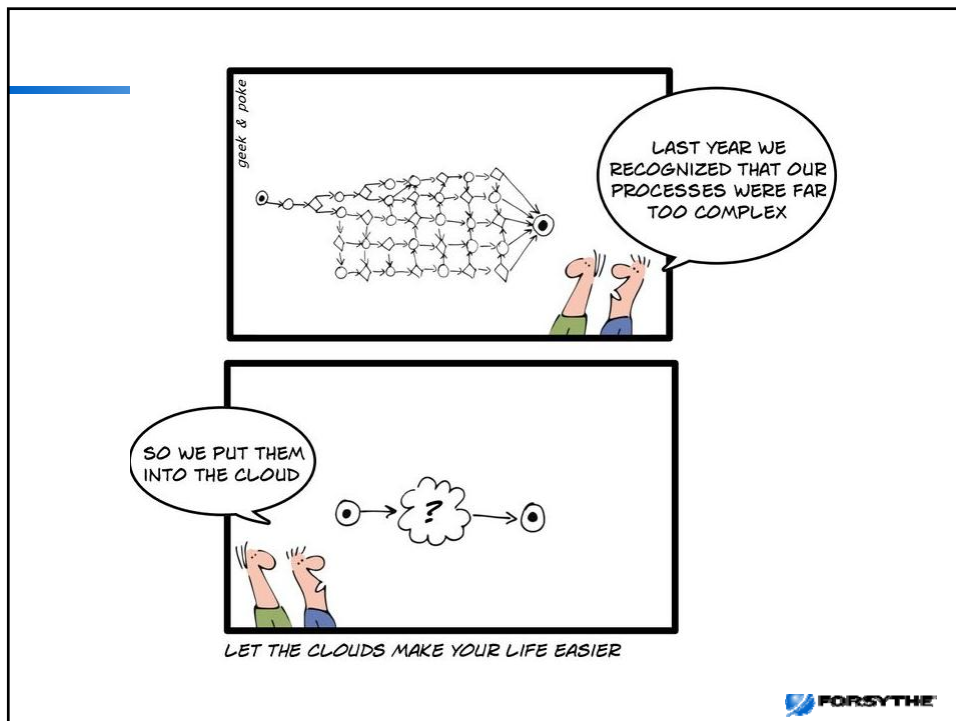
ENTER PURE SYSTEMS!

Built-in Expertise

Capturing and automating what experts do – from the infrastructure to the application

Integration by Design

Deeply integrating and tuning hardware and software – in a single, ready-to-go system

Fundamentally changing the experience and economics of IT

Simplified Experience

Making every part of the IT lifecycle easier
Integrated management of the entire system
A broad open ecosystem of optimized solutions

FORSYTHE

IBM PUREFLEX SYSTEM IS INTEGRATED BY DESIGN

Networking

Storage

Virtualization

Compute

Tools

Applications

Flexible and open choice in a fully integrated system

FORSYTHE

IBM PureSystems enable multiple client initiatives
Using a consistent, standardized approach

Optimize
Better tune and automate systems and applications to improve application performance, scalability and reliability

Innovate
More rapidly deliver new applications and services to meet new business needs

Consolidate
More efficiently consolidate systems and applications to reduce operating expenses

Accelerate Cloud
Launch self-service applications efficiently in a secure, and integrated cloud environment

Optimize

Innovate

Consolidate

Accelerate Cloud

FORSYTHE

IBM PureSystems are integrated by design

Expert integrated systems

Deployment

Applications

Middleware

Development

Management

Virtualization

Storage

Networking

Servers

IBM PureSystems

- PureApplication System
- PureFlex Integrated System
- FlexSystem Components

FORSYTHE

IBM PURESYSTEMS

The first members of a new family of expert integrated systems with:

- *Built-in expertise* to address complex business and operational tasks automatically
- *Integration by design* to tune systems for optimal performance and efficiency
- *Simplified experience* from design to purchase to maintenance

IBM PureFlex System

Expert at: sensing and anticipating resource needs to optimize your infrastructure

- Factory integrated and optimized system infrastructure
- Integrated management
- Automation and optimization expertise

(New)

IBM PureApplication System

Expert at: optimally deploying and running applications for rapid time-to-value

- Expert designed, integrated and optimized application aware platform
- Platform patterns of expertise
- Simplified management with a single console

(New)

FORSYTHE

SIMPLIFIED EXPERIENCE
PURCHASE AS USUAL OR AS A SIMPLIFIED INTEGRATED SYSTEM

Starts at Acquisition: A continuum of value from building blocks to systems

IBM Flex System

PureFlex

PureApplication

Chassis
14 half-wide bays for nodes

Compute Nodes
Power 2S/4S(1)
x86 2S/4S

Storage Node
V7000
Expansion inside or outside chassis

Management Appliance
Optional

Networking
10/40GbE, FCoE, IB
8/16Gb FC

Expansion
PCIe
Storage

Pre-configured, pre-integrated **infrastructure systems** with compute, storage, networking, physical and virtual management, and cloud management with **integrated expertise.**

Pre-configured, pre-integrated **platform systems** with middleware designed for transactional web applications and enabled for cloud with **integrated expertise.**

Note (1) : Power compute nodes only available in PureFlex, not ordered as a separate component

FORSYTHE

INTEGRATION BY DESIGN

Not Integrated ⟶ Fully Integrated	Integration from Factory	Integration with included Lab Services
Rack	●	
Chasses	●	
BNT Ethernet Switch(s)	●	
Fiber Channel Switch(s)	●	
TOR Switch(s)	●	
Management Node	◐	●
Storage (V7000)	◕	●
Compute Nodes	●	
Ethernet Mezz Card(s)	●	
Fiber Channel Mezz Cards(s)	●	
PowerVM	●	
Operating Systems	◕	
PowerSC	◔	
SmartCloud Entry	◐	

FORSYTHE

PURE FLEX

ENTERPRISE CHASSIS DESIGN

Chassis

System infrastructure

Infrastructure to support the compute, storage and networking components
◊
Energy efficient cooling and power system
◊
Easy to use with integrated single-point management
◊
Designed to support future advancements in I/O, processors, memory, and storage

IBM Flex System Chassis
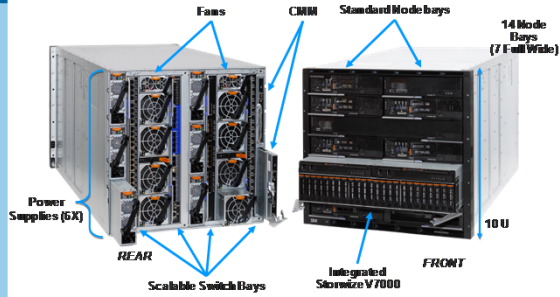
- 4 scalable switch bays
- 10U Chassis, 14 bays
- Standard and Full width node support
- Up to 6 2500W power supplies N+N or N+1 configurations
- Up to 8 cooling fans (scalable)
- Integrated chassis management through CME

FORSYTHE

IBM FLEX SYSTEM ENTERPRISE CHASSIS FRONT VIEW

Size: 10 U
19" Rack

14 Node Bays
(7 Full Wide)

Nodes:
- Power
- Intel
- Flex System Mgr

Flex System Mgr	IBM Flex System x240
Filler	Filler
Filler	Filler
IBM Flex System p260	IBM Flex System p260
IBM Flex System p460 (Full Width)	
Filler	Filler
IBM Flex System x240	Filler

FORSYTHE

IBM Flex System Enterprise Chassis Rear View

Fans

CMM

10 U

Power Supplies (6X)

High Speed Switch (4X)

FORSYTHE
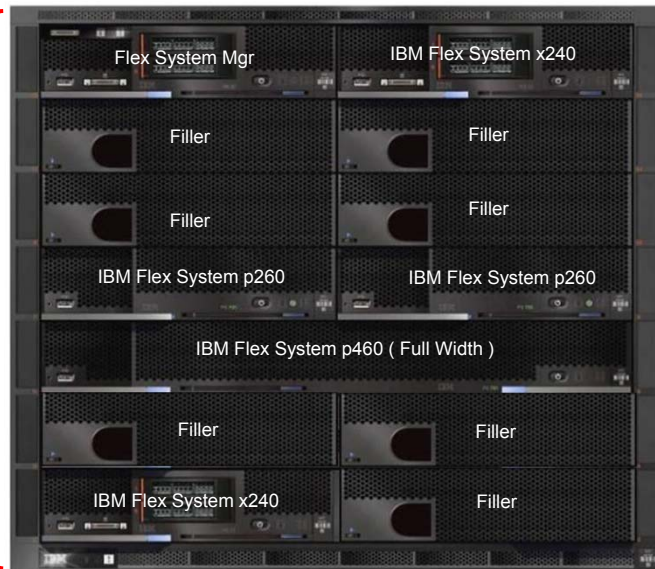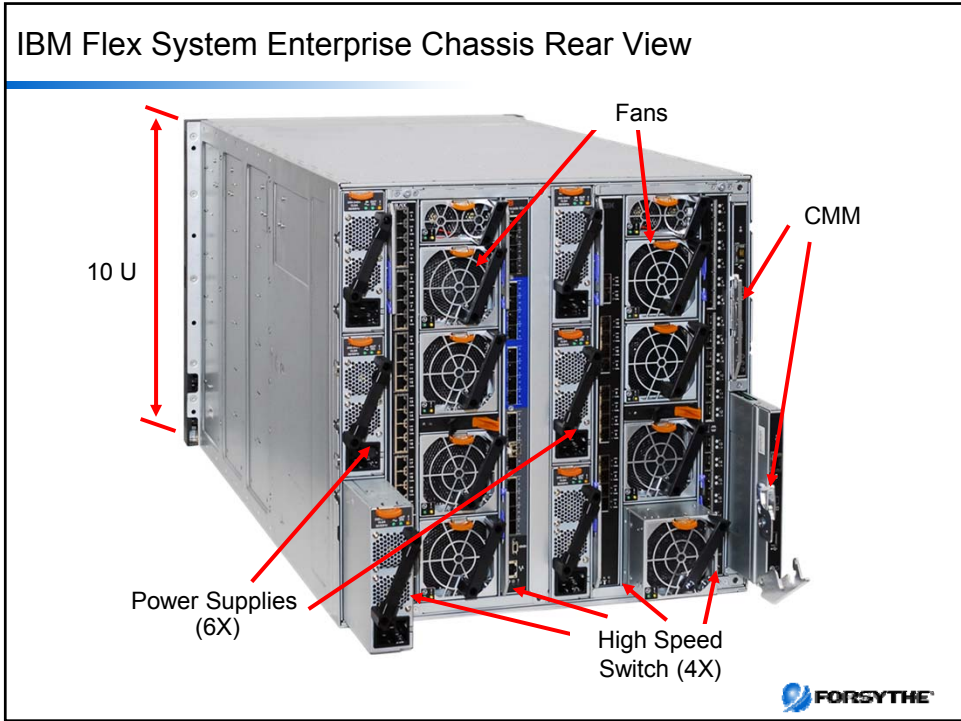
DIVERSE OFFERINGS TO MATCH THE DIVERSE WORKLOADS

Compute

System infrastructure

System Portfolio tuned to workloads
◊
Reduce acquisition costs through virtualization consolidation
◊
Maximum platform capability provides deployment flexibility

IBM Flex System x240

IBM Flex System p260

IBM Flex System p460

IBM Flex System Manager

FORSYTHE

18

IBM Flex System x240 - Enterprise Class

System infrastructure

Compute

Standard Width compute node
◊
2-socket Sandy Bridge-EP
◊
24 LP DDR3 DIMMs / 1333MHz / 1600MHz
◊
10Gb Converged LOM
◊
2 hot swap 2.5" SAS/SATA SSDs or HDDs
◊
Dual Enabled Hypervisor – ESXi on Flash Key Option
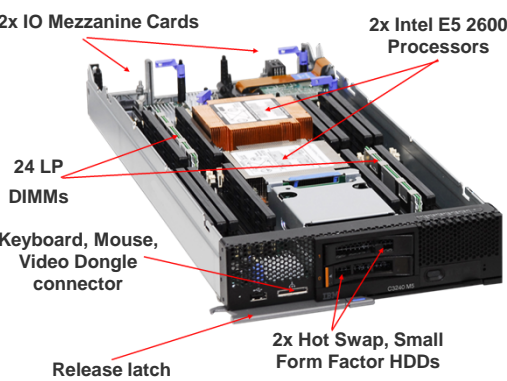
IBM Flex System x240

Uncompromised Compute, IO, and Storage performance, designed for mainstream virtualization, and a broad range of workloads

2x IO Mezzanine Cards

2x Intel E5 2600 Processors

24 LP DIMMs

Keyboard, Mouse, Video Dongle connector

2x Hot Swap, Small Form Factor HDDs

Release latch

FORSYTHE

IBM Flex System x220 - Value Class

System infrastructure

Compute

Standard Width compute node
◊
2-socket Sandy Bridge-EN
◊
12 LP DDR3 DIMMs / 1333MHz / 1600MHz
◊
1G base with FoD to 10Gb
◊
2 hot swap 2.5" SAS/SATA SSDs or HDDs
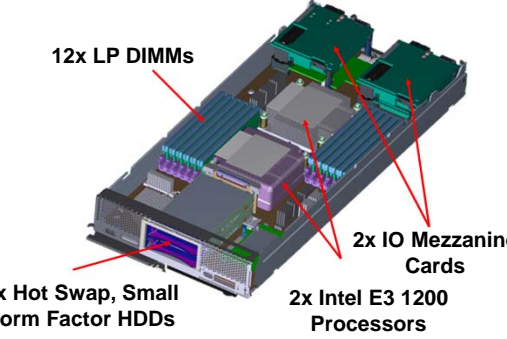
IBM 2S EN Compute Node

Entry cost optimized compute, designed for energy-efficiency, ideal for native and point application workloads

12x LP DIMMs

2x IO Mezzanine Cards

2x Hot Swap, Small Form Factor HDDs

2x Intel E3 1200 Processors

FORSYTHE

19

IBM Flex System p260

Compute

IBM Flex System p260

Standard Width compute node
◊
2-socket POWER7®
◊
64-bit POWER7® processor
◊
16 core : 2 Socket x8 core
◊
16 DIMMs DDR3, 1066 MHz, 256GB Max
◊
Dual Mezz cards and IO Hubs
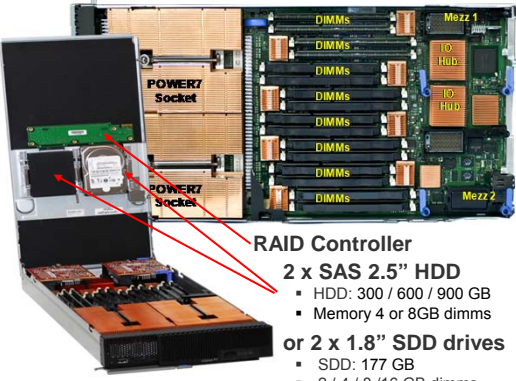
System infrastructure

Power is Performance Redefined
Delivers over 30% greater performance with similar density and energy use of the previous POWER7 blades

RAID Controller

2 x SAS 2.5" HDD
▪ HDD: 300 / 600 / 900 GB
▪ Memory 4 or 8GB dimms

or 2 x 1.8" SDD drives
▪ SDD: 177 GB
▪ 2 / 4 / 8 /16 GB dimms

FORSYTHE

IBM Flex System p24L

Compute

IBM 2S Power7 Compute Node for Linux only

Linux only Compute Node optimized for POWER architecture
◊
Tuned for PowerLinux Strategic Solutions
◊
2-socket Power7®
◊
12 to 16 cores : multiple speed
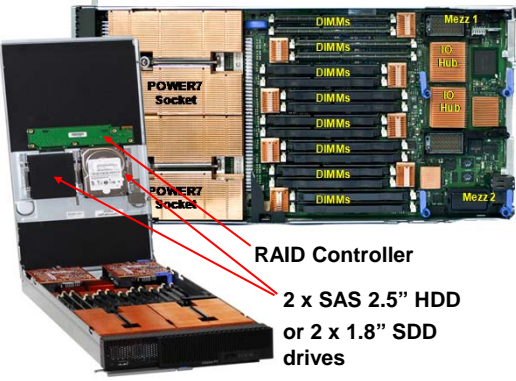
System infrastructure

Power is Performance Redefined
Actualize cost savings through reduced power consumption, shared resources, and increased utilization

RAID Controller

2 x SAS 2.5" HDD

or 2 x 1.8" SDD drives

FORSYTHE

IBM Flex System p460

Integration without compromise, designed for the next decade

Compute

IBM Flex System p460

Power is Performance Redefined
The same 4-socket server technology behind Watson, is now enhanced and available on Power Compute Node for IBM Flex System

System infrastructure
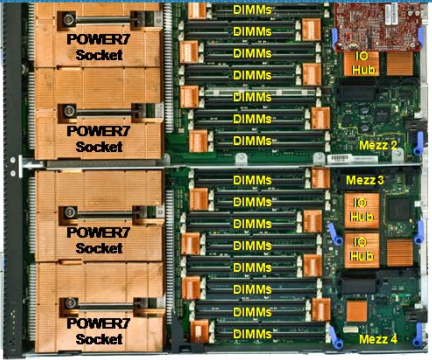
Full Width compute node
◊
4-socket POWER7®
◊
64-bit POWER7® processor
◊
32 core : 4 Socket x8 core
◊
32 DIMMs DDR3, 1066 MHz, 512GB Max
◊
Quad Mezz cards and IO Hubs

POWER7 Socket — DIMMs — IO Hub — Mezz 2 — Mezz 3 — Mezz 4

*HDD or SSD – Mounted on cover (located over memory)

FORSYTHE

EXPERIENCE THE PERFORMANCE OF IBM STORWIZE V7000 STORAGE
DELIVERS UNPRECEDENTED, FLEXIBILITY, EASE-OF-USE, AND VALUE

A continuum of value from IBM Storwize V7000 storage

Expert Integrated Systems

Storage disk system that offers

- Efficient use of solid state disk to Increase performance up to 200% on critical apps.
- Extraordinary performance
- Flexibility throughout
- Thin provisioning
- Non-disruptive migration of data from existing storage
- Simplified implementation

Advanced storage features include

- Automated tiering
- Storage virtualization
- Clustering
- Replication
- Multi-protocol support

IBM Storwize V7000

FORSYTHE

IBM PUREFLEX SYSTEM STORAGE INTEROPERABILITY

Storage

System infrastructure

IBM Flex System V7000 Storage Node
✓ Integrated virtualized IBM Flex System Storage

IBM Flex System Storage Virtualization
✓ Virtualize external Storage for greater data center efficiency and utilization
✓ Avail in: Storwize V7000, IBM Flex System V7000, & SVC

IBM Flex System Storage Interoperability
✓ Broad set of IBM storage supported with IBM Flex System
✓ Interop with 3rd party via Virtualization

IBM Flex System FSM Storage Control
✓ Discovery and Inventory
✓ Monitoring and Alerts
✓ Configuration
✓ Provisioning

IBM Flex System FSM Advanced
✓ Integrated virtualization management across server, storage, network
✓ Image repository and management Storage provisioning for image creation, deployment, and cloning
✓ System Pools Integrated management of storage in lifecycle of defining and managing system pools
✓ Virtual Image Cloning
✓ Integrated storage provisioning and virtual image placement for new virtual machines

Centralized management to reduces costs and complexity across server and storage

IBM Flex System Chassis

FSM

Other storage Virtualization options

Storwize V7000

IBM Flex System V7000 Storage Node

IBM SVC

Direct Interoperability or via Storage Virtualization

Via Storage Virtualization

DS8100, DS8300, DS8700, DS8800 | XIV | Storwize V7000 | DS3400, DS3500, DS4100, DS4200, DS4300, DS4400, DS4500, DS4700, DS4800, DS5020, DS5100, DS5300,N3600, N3700, DS6800 Included in Base Director

FORSYTHE

Optimized, Automated and Integrated network architecture
Fits within your existing and future environment

The Problem:

Today's networking offerings lack the flexibility to meet the **demands** of the next decade of I/O. Clients are often burdened **now** with the costs of technology for **tomorrow**.

Extreme Flexibility
• Designed to meet port and bandwidth requirements for next decade
• Pay for what you need today with Features on Demand (FoD)

Highest Performance
• First 40Gb capable Ethernet Switch
• First 16Gb capable SAN Switch
• First 56Gb capable Infiniband FDR switch
• Up to 220Gb uplink BW and <1microsec latency

Standards based Convergence
• 10Gb iSCSI and FCoE offering
• First 40Gb end to end FCoE offering (post GA)
• Standard based for seamless integration
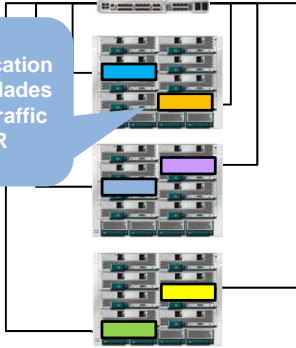
FORSYTHE

Network Switching and Why it Matters

The Problem:

Blade to blade **communication** flows north-south through the TOR, causing **latency** from request / response traffic. Added network latency will impact the overall **workload** the servers can support.

Communication between blades requires traffic to TOR

The Flex System Difference:

Do more with your servers and **reduce** network delays. Node to Node communication happens **within** the chassis.

Communication is contained within chassis running at 10GB Ethernet

Why this matters:
- Reduces switch latency
- Additional servers needed to overcome performance loss in network delays
- Low latency, web-serving, and database apps create significant server to server chatter and stress on the network

FORSYTHE

Full breadth of Networking offerings

Networking

Simplifies network deployment via integrated management
◊
Reduces network complexity via convergence and intelligent fabric monitoring
◊
Improves network performance via uncompromised IO throughput
◊
Fits with existing infrastructure and scales with Customer's IO needs

System infrastructure

IBM Networking Offerings

- Scalable Switch modules for the IBM Flex System chassis
- Four Scalable switches per chassis
- Capable to provide up to 16 virtual switch partitions per chassis
- Feature on Demand port upgrades for switches

	Ethernet & FCoE	Fibre Channel	InfiniBand
Switch	• 52 port 1Gb Switch 　Base: 14/10 (internal/external) 　Upgrade: 14/10 　Upgrade: four 10Gb uplinks • 64 port 10Gb Ethernet Switch 　Base: 14/10 　Upgrade: 14/8 (two 40Gb uplink) 　Upgrade: 14/4 • 1/10Gb Pass Thru	• 20 port 8Gb • 20 port 8Gb Pass Thru • 48 port 16Gb	• QDR Switch upgrade: FDR
Adapter	• 4 port 1Gb - Broadcom • 4 port 10Gb - Emulex • 2 port 10Gb – Mellanox	• 2 port 8Gb – Qlogic • 2 port 8Gb – Emulex • 2 port 16Gb – Brocade	• QDR & FDR Adapter

*Available at launch

FORSYTHE

PURE APPLICATION

WHAT THE BUSINESS WANTS…

What's required…

Application

← Scaling →

Database

HTTP Server

WAR File
Application Server

WAR File
Application Server

Monitoring
Lifecycle
Management

Caching Server

Caching Server

LDAP

Schema
Database

FORSYTHE

What will be needed tomorrow…

Monitoring
Lifecycle
Management

FORSYTHE
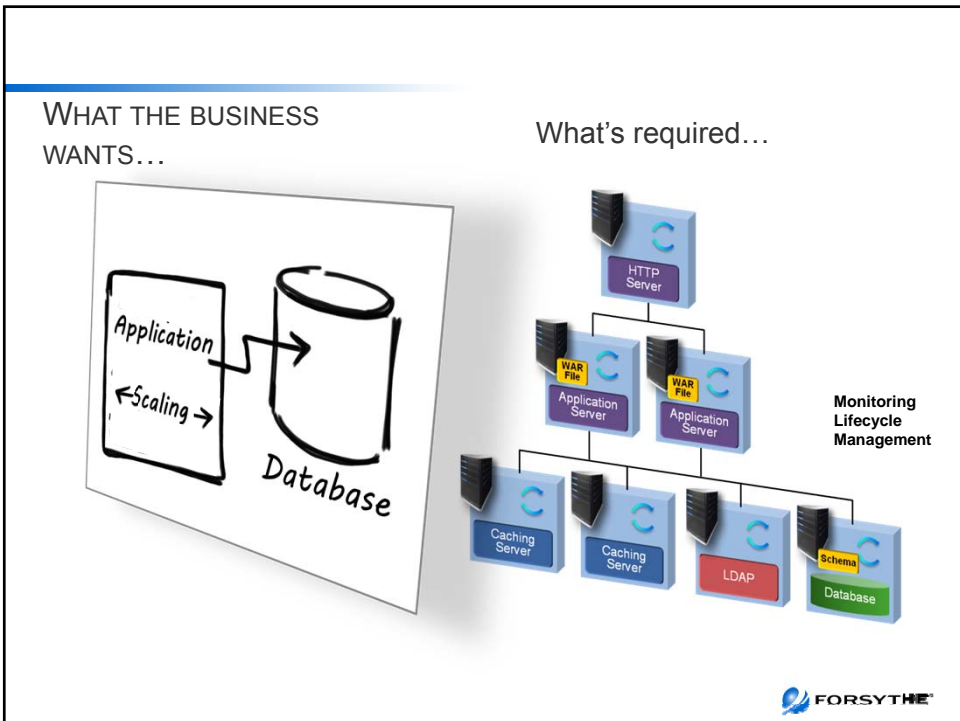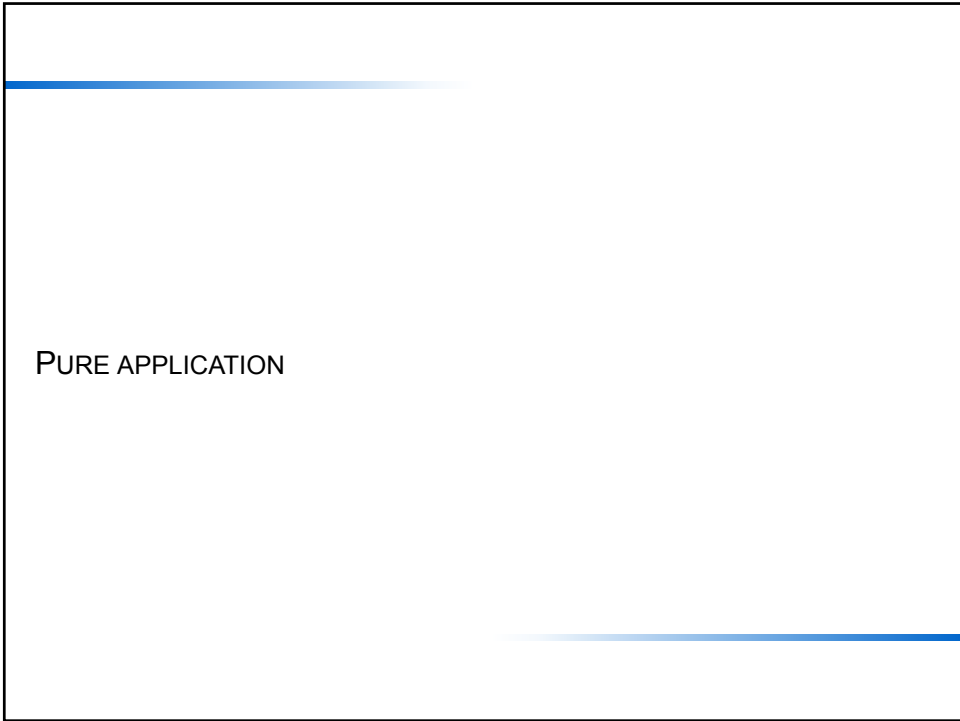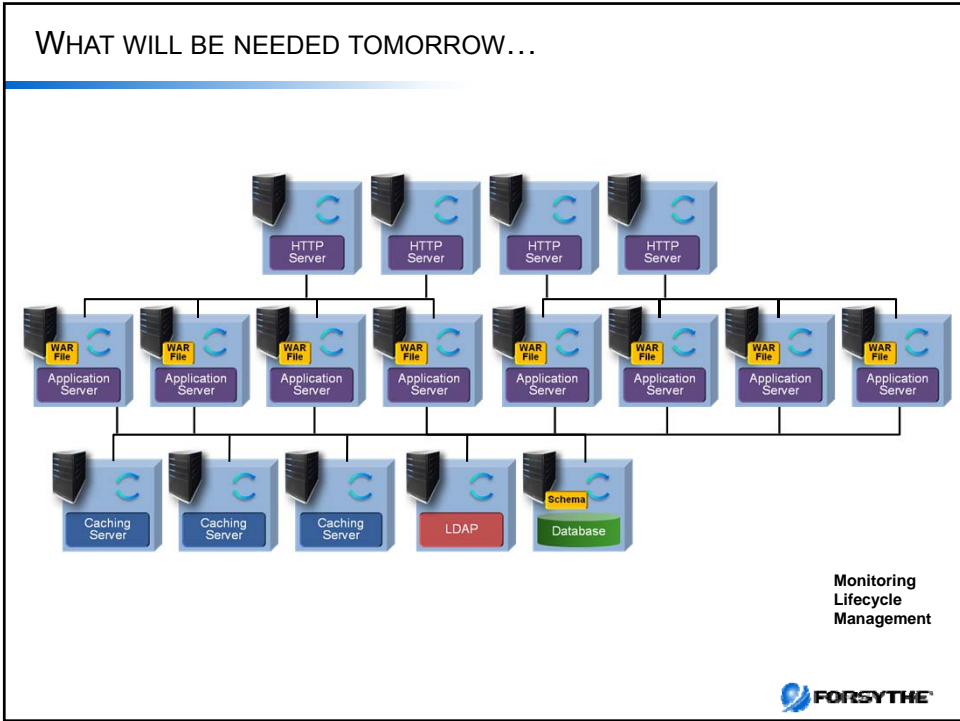
PureApplication System

	IBM PureApplication System W1500-96	IBM PureApplication System W1500-192	IBM PureApplication System W1500-384	IBM PureApplication System W1500-608
Cores	96	192	384	608
RAM	1.5 TB	3.1 TB	6.1 TB	9.7 TB
SSD Storage	6.4 TB	6.4 TB	6.4 TB	6.4 TB
HDD Storage	48.0 TB	48.0 TB	48.0 TB	48.0 TB
Application Services Entitlement	Included	Included	Included	Included

FORSYTHE

EXTENSIBILITY FROM THE BROADEST ECOSYSTEM IS MADE EASY

New IBM PureSystems Centre:

- Gain access to a broad community of IBM and certified partner expertise
- Download optimized, deployable application patterns from 100+ leading ISV partners
- Search by solution area, industry or system
- Download fixes and patches
- Access to developer community

Also run your existing applications today*

IBM PURESYSTEMS "PATTERNS OF EXPERTISE"

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 and then built into the system

Patterns deliver superior results:

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

Through *unmatched expertise* in:

- System design
- Infrastructure management
- Application deployment
- Data management
- Datacenter management

- High availability and scalability
- Security
- Storage optimization
- Networking
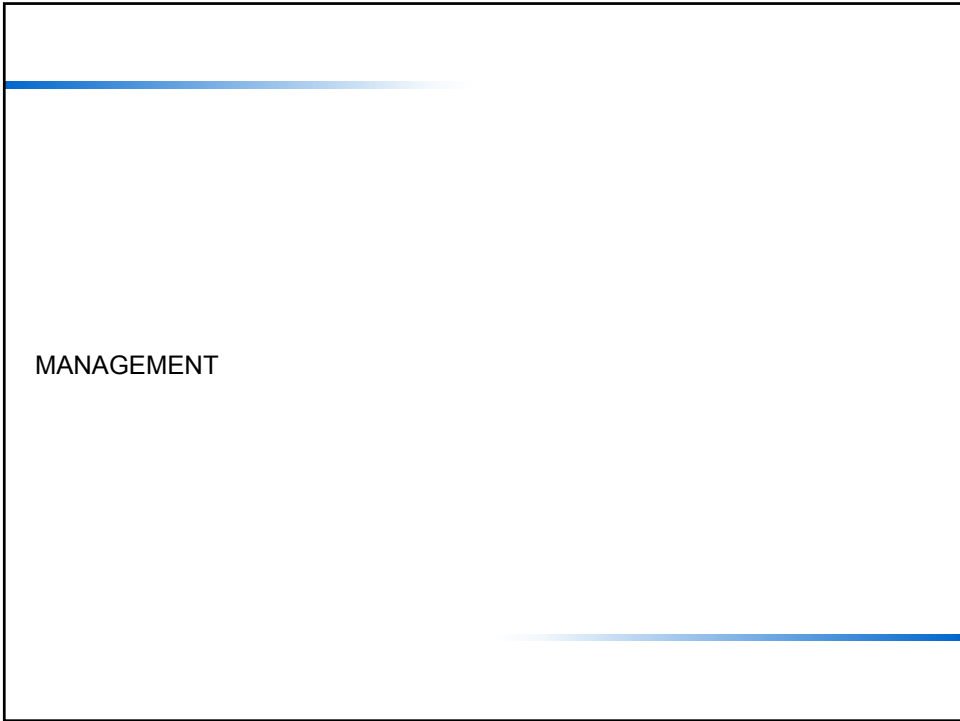
MANAGEMENT

IBM PureSystems are integrated by design

IBM Flexsystem Building Blocks

- X86 and POWER Nodes
- Storage Integration
- Networking Integration
- Management Node
- Completely Customizable

Deployment

Middleware   Applications

Development

Management

Virtualization

Storage   Networking   Servers

Expert integrated systems

FORSYTHE

MANAGEMENT SOFTWARE

Need to manage many heterogeneous systems and partitions

Monitoring of more than performance

- Things like power (also controlling it)
- Load balancing
- Automatic provisioning

IBM options:

- Systems Director
- Active Energy Manager
- VM Control (with NIM)
- Live Partition Mobility

Many other tools out there

Convergence is Key

FORSYTHE

Simplified management experience with advanced automation
Reduced risk through integrated platform management
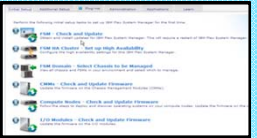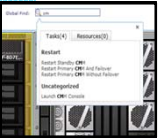
- New user interface and configuration automation brings new components online faster*
- Cross-resource integration and automation enables transformation from managing resources to managing applications, services and workloads
- Works with the management you have - other IBM platform tools, Tivoli and third party enterprise management (e.g., CA, BMC, HP, etc.)
- Easier monitoring, alerts and problem management through automated resolution processes with integrated expertise

Setup Wizards   **Global Find**   **Chassis Map**   **Remote Presence**

FORSYTHE

IBM PUREFLEX OS SUPPORT

A fully integrated and open infrastructure for unprecedented flexibility with integrated automation and optimization expertise

Flexible and Open Environment Choice

AIX	i	Linux	Windows
PowerVM	KVM	VMware	HyperV

Integrated, Flexible Management

Availability

Virtualization

Platform

Servers	Storage	Networking

Integrated Infrastructure

FORSYTHE
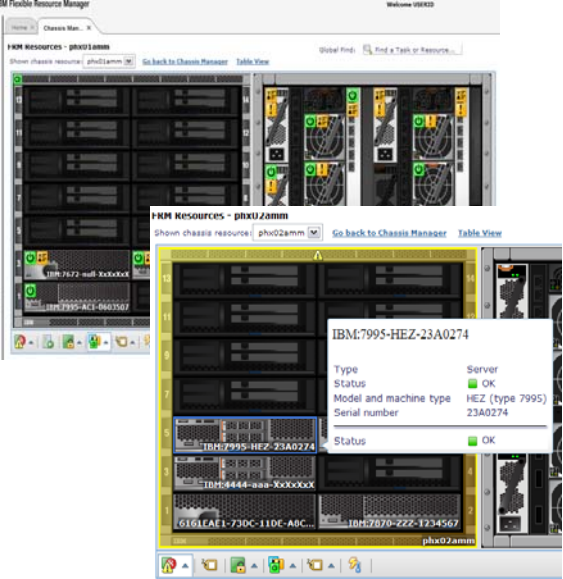
Chassis Management

Systems Management Appliance

▪Single focus point for seamless multi-chassis management

▪Resource oriented chassis map provides multiple view overlays to:
  ▪ Monitor system health
  ▪ Work with firmware inventory
  ▪ Environmental status

▪Includes quick finder to launch to common management tasks

▪Chassis map provides launch point for remote access tools to work with OS, etc. on individual nodes

FORSYTHE

VIRTUALIZATION MANAGEMENT

- Virtualization Management
  - Manage Virtual Servers and Hosts
  - HMC and Systems
  - VS Life-cycle management
  - Topology Maps
  - Create empty virtual server
  - Monitoring, automation
- Edit virtual resources
  - Edit Hosts
  - Edit Virtual Servers
  - GUI or command line
  - Launch to Platform Manager
- Relocate
  - Live relocation
  - Plan for relocation

FORSYTHE
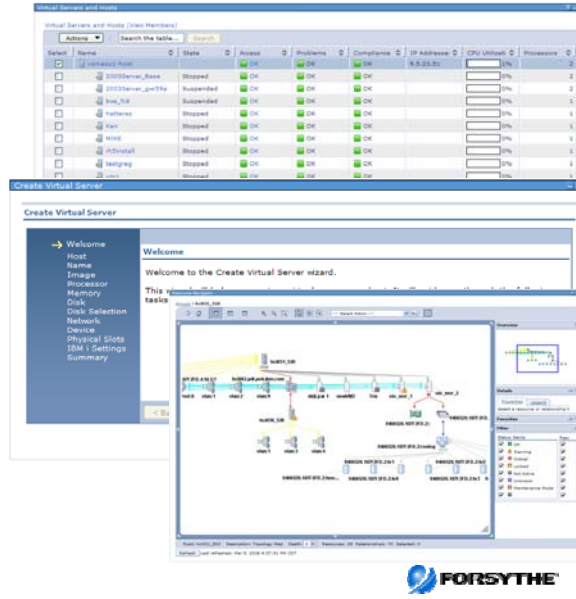
ADVANCED VIRTUALIZATION
AUTOMATE THE VIRTUALIZED ENVIRONMENT WITH SYSTEM POOLS

- Intelligent Virtual Machine Placement Services (KVM/POWERVM Today)
- Dynamic Workload Mobility (KVM/POWERVM Today)
- Integrated Storage and Network Management
- Automation policy control for workloads (KVM/POWERVM Today)
  - Advise – VMControl recommends actions and requires confirmation
  - Automate – VMControl automates actions
- Availability Automations
  - Automate relocation of virtual workloads in response to predicted host system failures without disruption
  - Restart virtual workloads when a host fails
  - Automate remote restart of virtual workloads in response to host failures with minimal disruption
- Energy Automations w/ Active Energy Manager
  - Allows the pool to relocate VM's to minimum hosts
  - Minimum number of hosts reduce overall energy bill
- Performance Automations
  - Allows pool to spread VM's for optimum performance

FORSYTHE
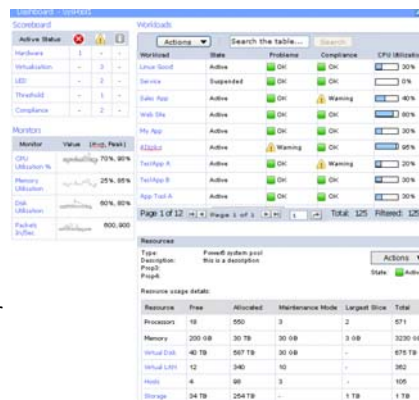
IBM FLEX SYSTEM - UPDATE MANAGER

- Manage updates for many IBM platforms using the same interface
  - Automatically check for new updates
  - Show and install updates needed by your systems

- Monitor system compliance
  - Create compliance policies to automatically notify you when a system is out of date
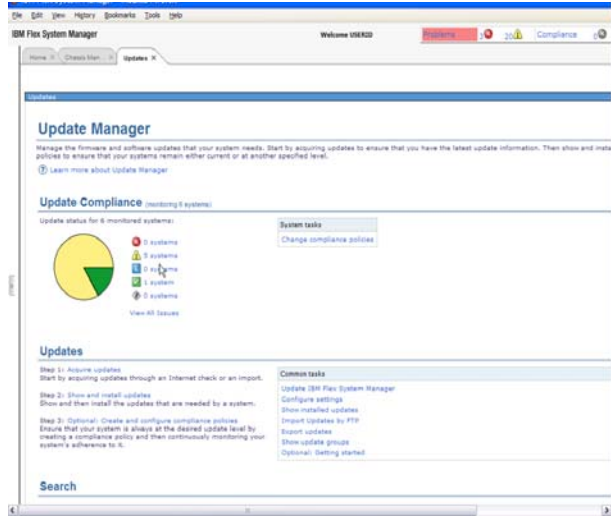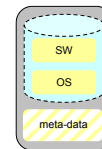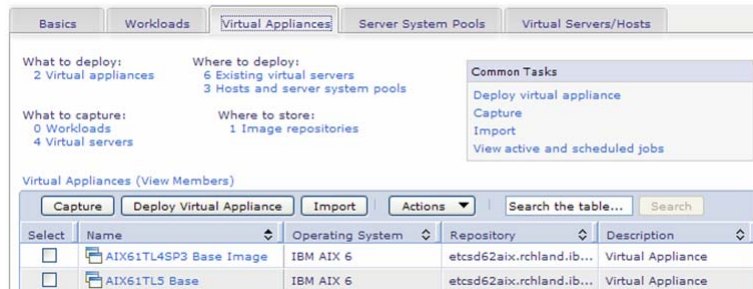 - Show and resolve compliance issues to install the missing updates

IMAGE MANAGEMENT AND DEPLOYMENT

Tasks for Virtual Appliances
- Deploy
- Import
- Capture
- Versioning
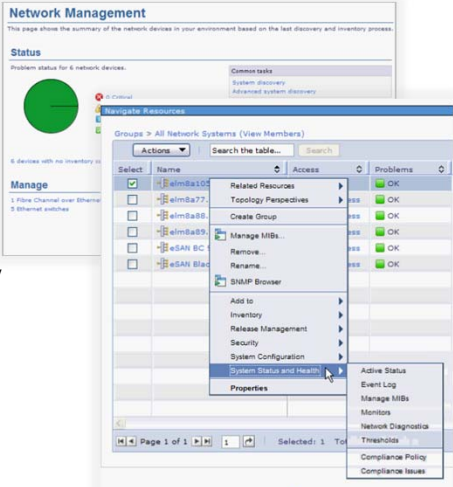
Virtual Appliance

Integrated Network Management with Network Control

- Logical network management – allows management of port profiles, VLANs, ACLs and QoS in virtualized, live-migration environments

- Leverages 802.1Qbg standards in integrated switches and PowerVM, KVM and IBM "Osiris" vSwitch for VMware (standards-based alternative to Cisco's proprietary VN-Tag)

- Optional Fabric Management extends QoS Management providing advanced monitoring, VM priority and rate limiting

- Network monitoring at a glance via network topology perspectives with the ability to see the components affected by network outages

- Enable end-to-end network and virtualization management

- Graphical view of L2 network connectivity using topology perspective

---

Mobile Management

Designed optimized and simplified for mobile scenarios and handheld limitations

Pocket Power - Multi-chassis monitoring in a pocket-sized device (top user pain point continues to be multi-chassis management, although the mobile app doesn't do everything)

Killer app - users say they'd switch mobile devices to use it

Multi-chassis   Chassis   Compute Node

POSITIONING

CURRENT STATE

Pureflex with single VIOS on p260 and dual VIOS on p460
X240 Intel node
Flex Systems Manager
V7000 integrated storage

SODs

Flex System Storage Node – update to v7000 to improve virtualization and efficiency even further

Additional x compute nodes
Additional I/O cards
High availability offerings
Systems Profiles for hardware provisioning
Monitoring and capping of energy
Improvements in security integration and security policy management
Integrated fabric monitoring and management

FORSYTHE

IBM LINEUP

Smarter Computing
The IT infrastructure that enables a Smarter Planet

Client-optimized system:
highly customizable systems designed to deliver the best in class capabilities uniquely tailored for the client's environment

Expert integrated systems:
combine the flexibility of a general purpose system with the simplicity of an appliance – and integrated expertise throughout

System z
Freedom through design

Power Systems
Performance redefined

System x
Defining the next generation of x86 servers

IBM Storage
Expect more from your Storage

Built-in Expertise — Business — Integration by Design
Expert Integrated Systems
Simplified Experience — IT

IBM PureApplication System

IBM PureFlex System

FORSYTHE

IBM SYSTEMS OVERVIEW

zEnterprise

Power HE

Power 770

Power 4S Power 2S

Power Blades

x Blades

eX5 High End

x Volume Rack

x Volume Tower

PureApplication System
- WebSphere
- DB2

PureFlex Solutions
- Power 4s and 2s
- x86 4s and 2s
- Storage
- Networking

- **PureFlex System** provides unified management with enterprise storage and choice of compute nodes (Power and x86).

- **PureApplication System** provides a pre-integrated, pre-optimized hardware and software stack with a single point of management . It should be the first choice to compete with Oracle Exalogic offering.

- **System z** remains the enterprise consolidation system with best economics for clients, delivering the best availability, security, scale and management required for enterprise critical work. zEnterprise with zBX is a proof point for hybrid universal management capabilities of IBM. zEnterprise can be connected to PureFlex System and both environments managed through the Tivoli suite.

- **Enterprise Power (High End and 770)** continues to be the leading system for UNIX consolidation with 60% unit share; delivers leadership virtualization, performance, security and resiliency needed by most enterprise clients.

- **Power Express** (4s and 2s) provides highly customizable systems for traditional UNIX and IBM i applications in Midmarket or distributed enterprise clients.

- **Power Blades** will transition to PureFlex System Power Compute Nodes.

- **System x Blades** should be prioritized if the customer focuses on existing investment protection.

- **eX5 High End** should be prioritized for scale-up and maximum x86 memory requirements.
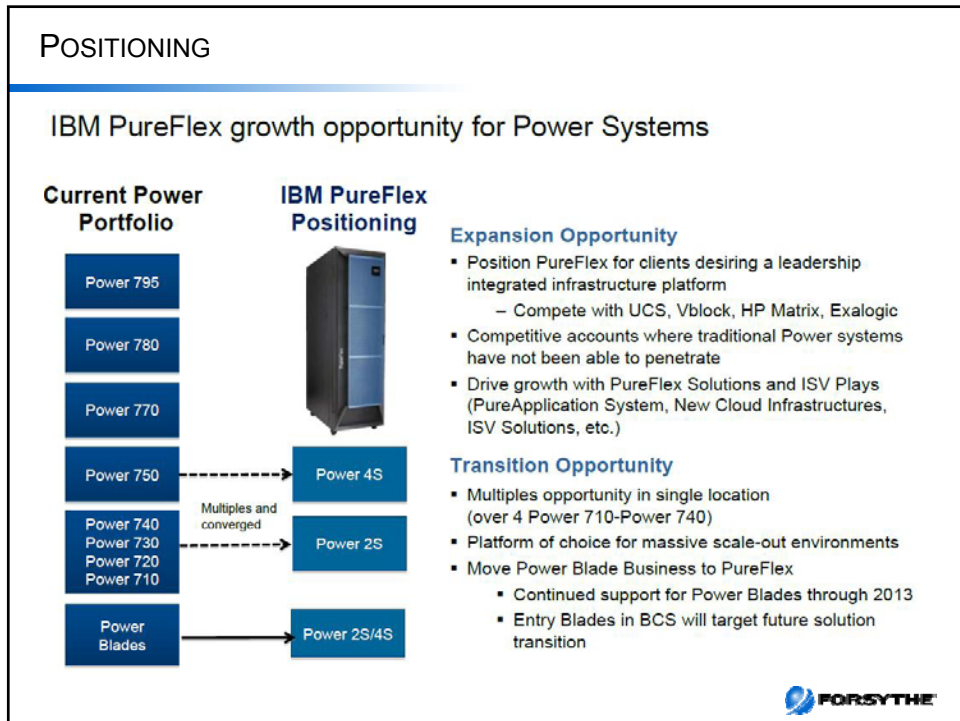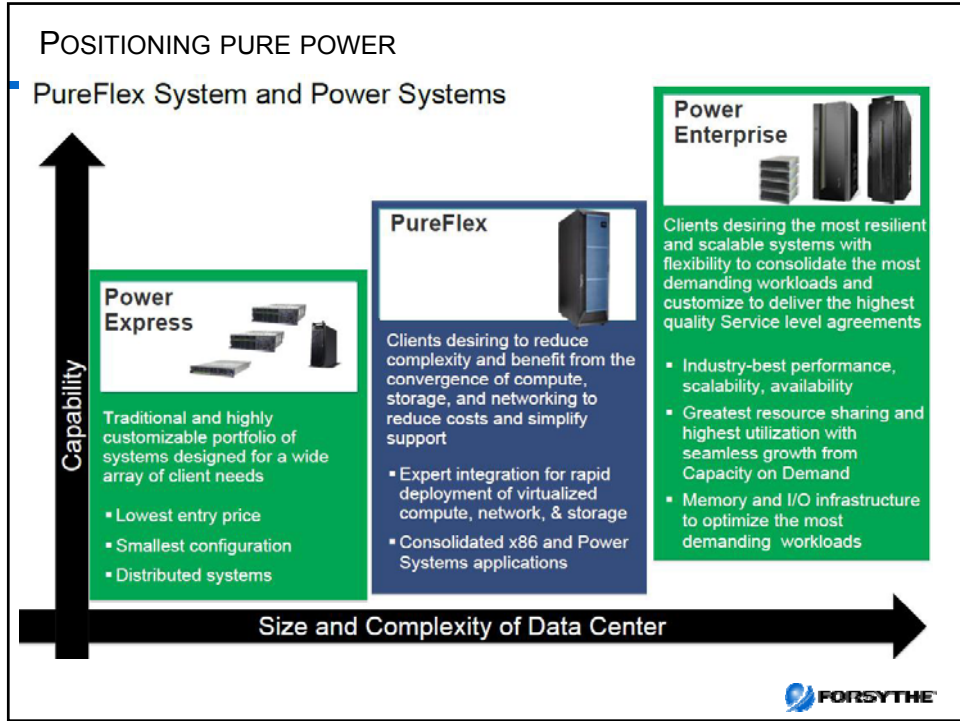
FORSYTHE

So ….. How do we get from A to B?

A   B

Expert
Integrated   AKA Pure
Systems

Getting help?

Andy Goade
agoade@forsythe.com

Jaqui Lynch
lynchj@forsythe.com

Jeremy Wonson
jwonson@forsythe.com

QUESTIONS