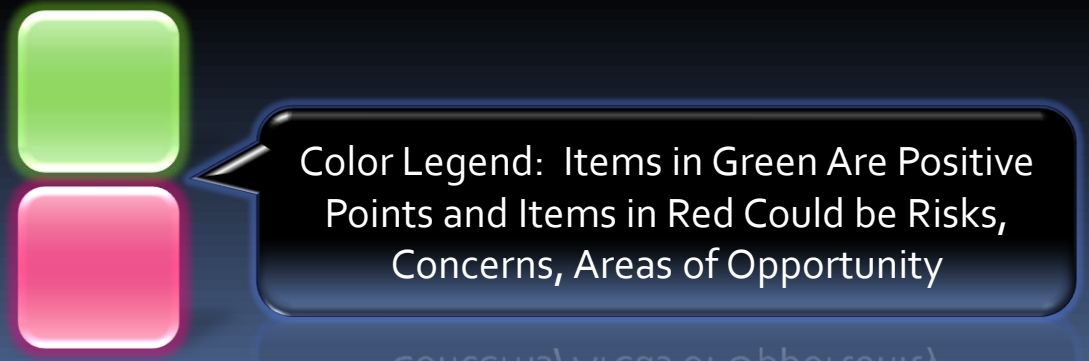
Ideas for Today and Tomorrow

STRATEGIC INFRASTRUCTURE RECOMMENDATION FOR XXb

XXa = Parent Company Business Unit a XXb = Company XX Business Unit b
OPS = Global Support Team NWT = XXb's Network Facing Support Team

Goals and Objectives at Hand

Current State of the Infrastructure → Recommendation → Next Steps



Vision Statement, Approach and Methodology for XXb Infrastructure

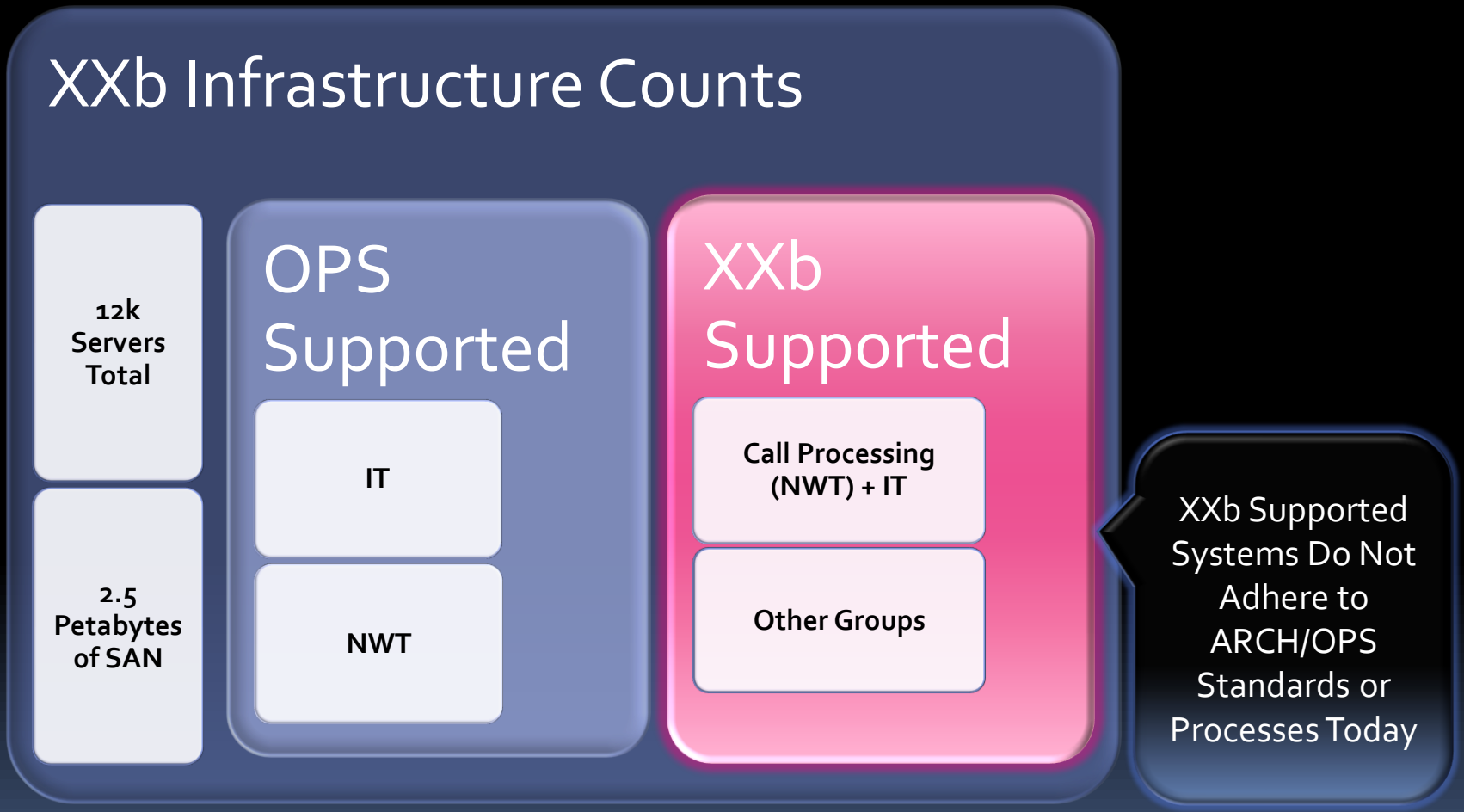
A Consolidated, Standardized, Centralized, Shared Computing Environment which Promotes the Efficient Use of Computing Resources, Effective and Efficient Application Lifecycle Processes and Ease of Maintenance while Understanding the Fiscal Responsibilities of XXb

Approach and Methodology

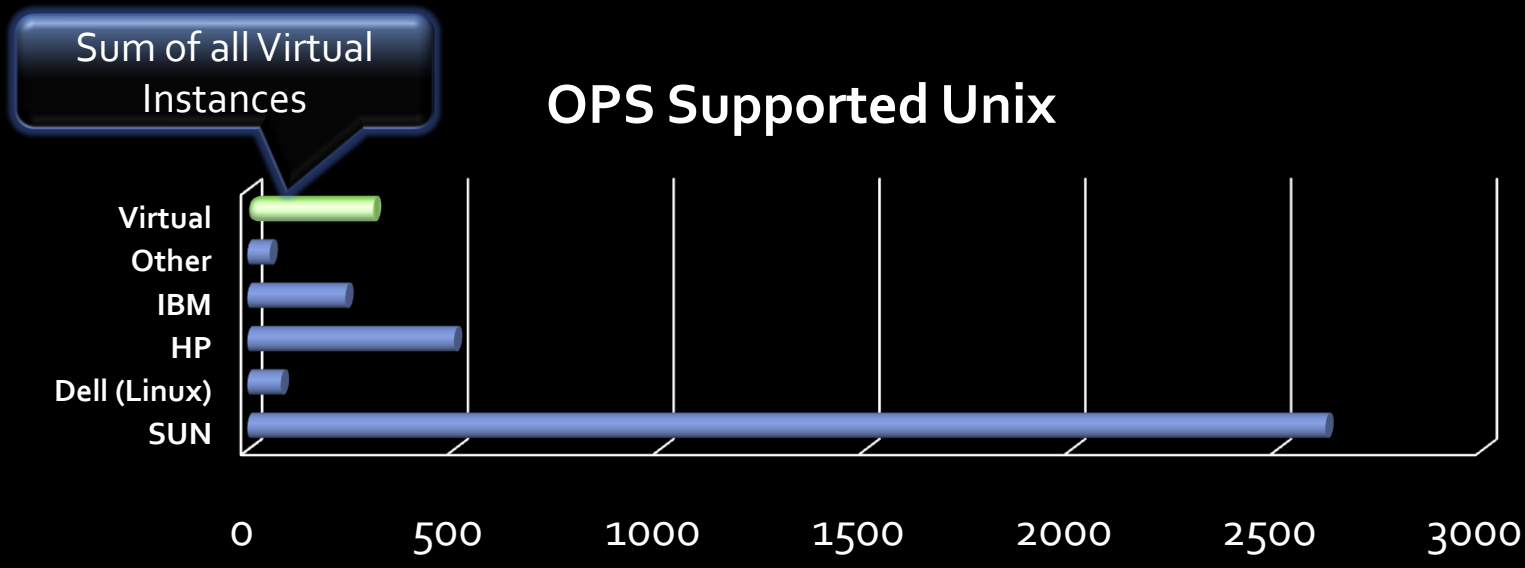
Full Understanding of Requirements and Environments	Matching Requirements to Correct and Desired Processes	Utilizing Identified Processes to Fully Optimize the Management of Infrastructure	Application of Services Framework Methodology at Targeted Areas of Requirements	Engaging Proper Capacity Planning Practices Required to Enhance, Promote Maintain and Report off of the Targeted Environments

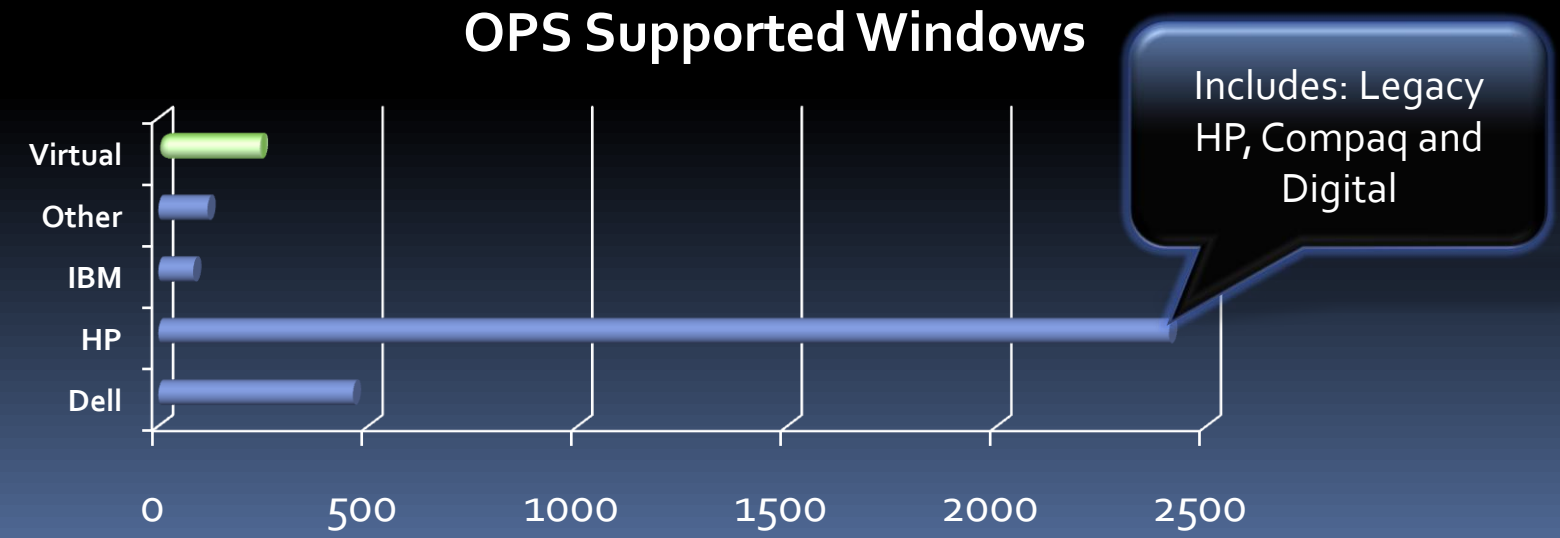
CURRENT INFRASTRUCTURE STATUS

Today's Situation – Make Up

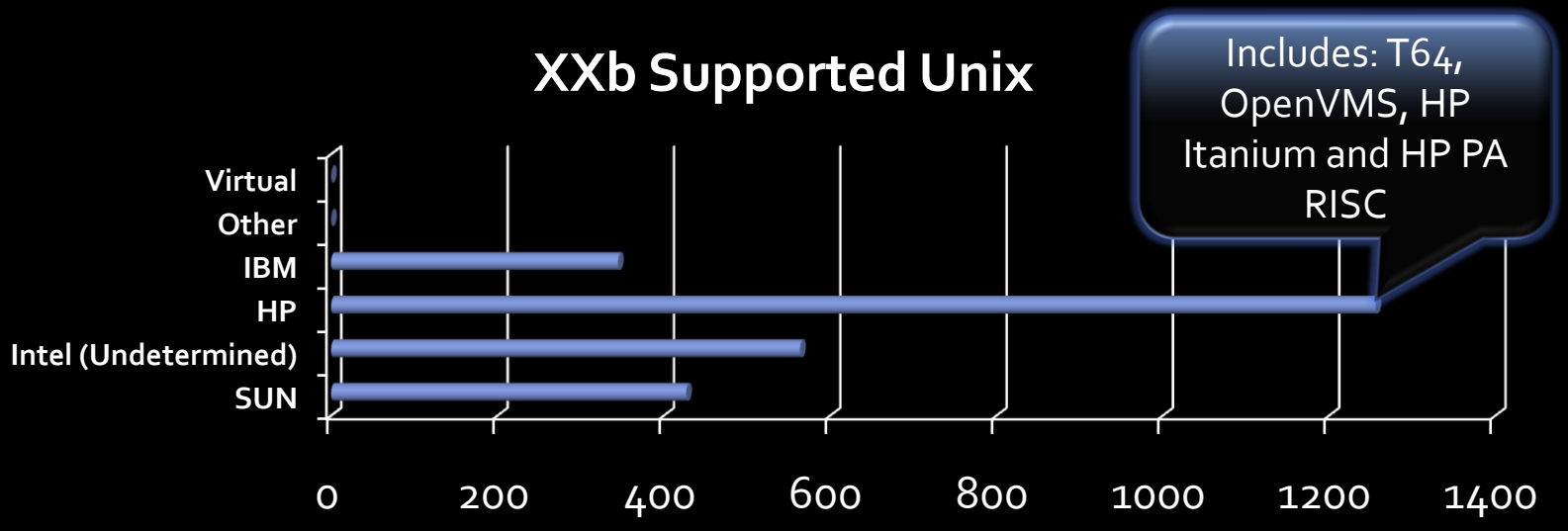


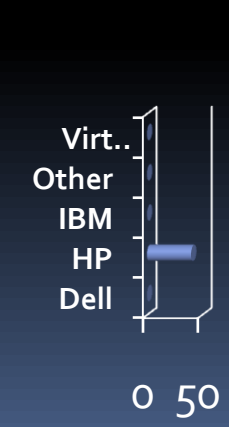
Today's Situation - Counts



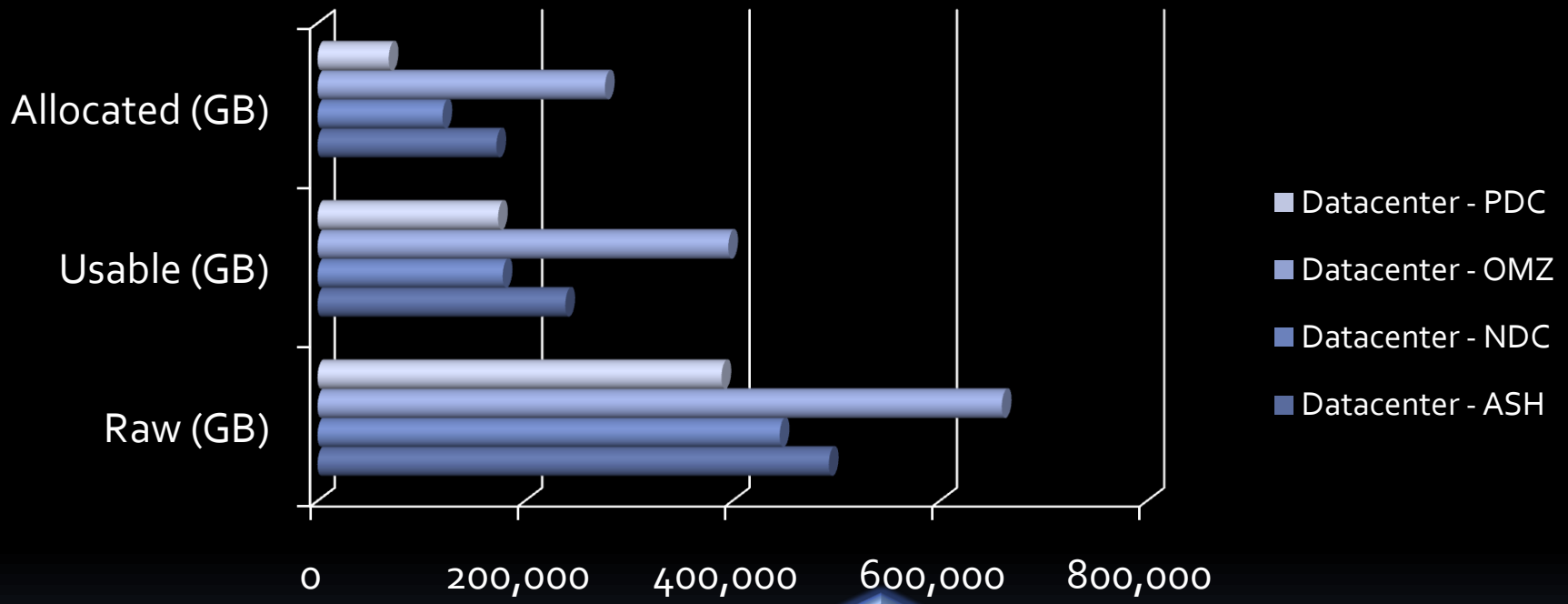


Today's Situation - Counts





XXb Enterprise SAN Utilization



All XXb Application On Tier-2 Storage or Lower. No Tier-1 Storage Has Been Required by Applications in Past 3 Years

Unix Server Breakdown by DC*

* OPS Supported Breakdown Only

	DC1	DC2	DC3	DC4	DC5	DC6	DC7	DC8	DC9	Non DC	DC10	Total OPS Managed	Total XXb Managed
SUN	130	177	250	167	312	718	19	69	329	578	67	2686	427
Dell	3	18	19	0	16	16	0	0	7	5	0	81	564
HP	102	69	156	7	44	33	10	2	55	126	6	508	1256
IBM	42	42	24	16	40	65	1	10	8	32	40	278	345
Other	5	0	1	1	1	6	0	0	6	39	0	54	0
Virtual	1	161	34	0	50	17	0	36	3	4	26	331	0
Total	282	306	450	191	413	838	30	81	405	780	113	3607	2592

Windows Server Breakdown by DC*

* OPS Supported Breakdown

	DC1	DC2	DC3	DC4	DC5	DC6	DC7	DC8	DC9	Non DC	DC10	Total OPS Managed	Total XXb Managed
Dell	130	18	11	0	9	180	16	9	11	194	16	464	0
HP	3	512	295	88	154	528	41	27	92	619	55	2411	40
IBM	102	0	4	0	3	5	0	2	42	24	3	83	0
Other	42	0	2	0	2	0	0	8	0	31	74	117	0
Virtual	5	73	60	0	24	82	3	0	0	0	0	242	0
Total	277	530	312	88	168	713	57	46	145	868	148	3075	40

Storage Utilization Breakdown

Location	Raw (GB)	Usable (GB)	Allocated (GB)	Total Ports	Active Ports	% Ports Active	Total Hosts
Datacenter - ASH	493,139	238,976	172,501	924	395	43	75
Datacenter - NDC	445,691	178,533	120,440	700	291	42	37
Datacenter - OMZ	659,893	396,134	277,129	1,164	639	55	147
Datacenter - PDC	389,570	174,100	68,592	524	247	47	17
Totals :	2,025,050	1,010,747	657,626	3,312	1,572	47	276

Data provided by UISreporting, Unknown if OPS Will Maintain Reporting Portal for XXb

Today's Situation – Functional Farm

Quantifying Use of Shared Services SQL/Oracle/Web Services vs. Stand Alone Instances (75%-90%)

XXb MS SQL Farms

- Most MS SQL Needs Satisfied by XXb Shared Environments
- Capacity Managed by XXb DBA Team

XXb Web Services Farms

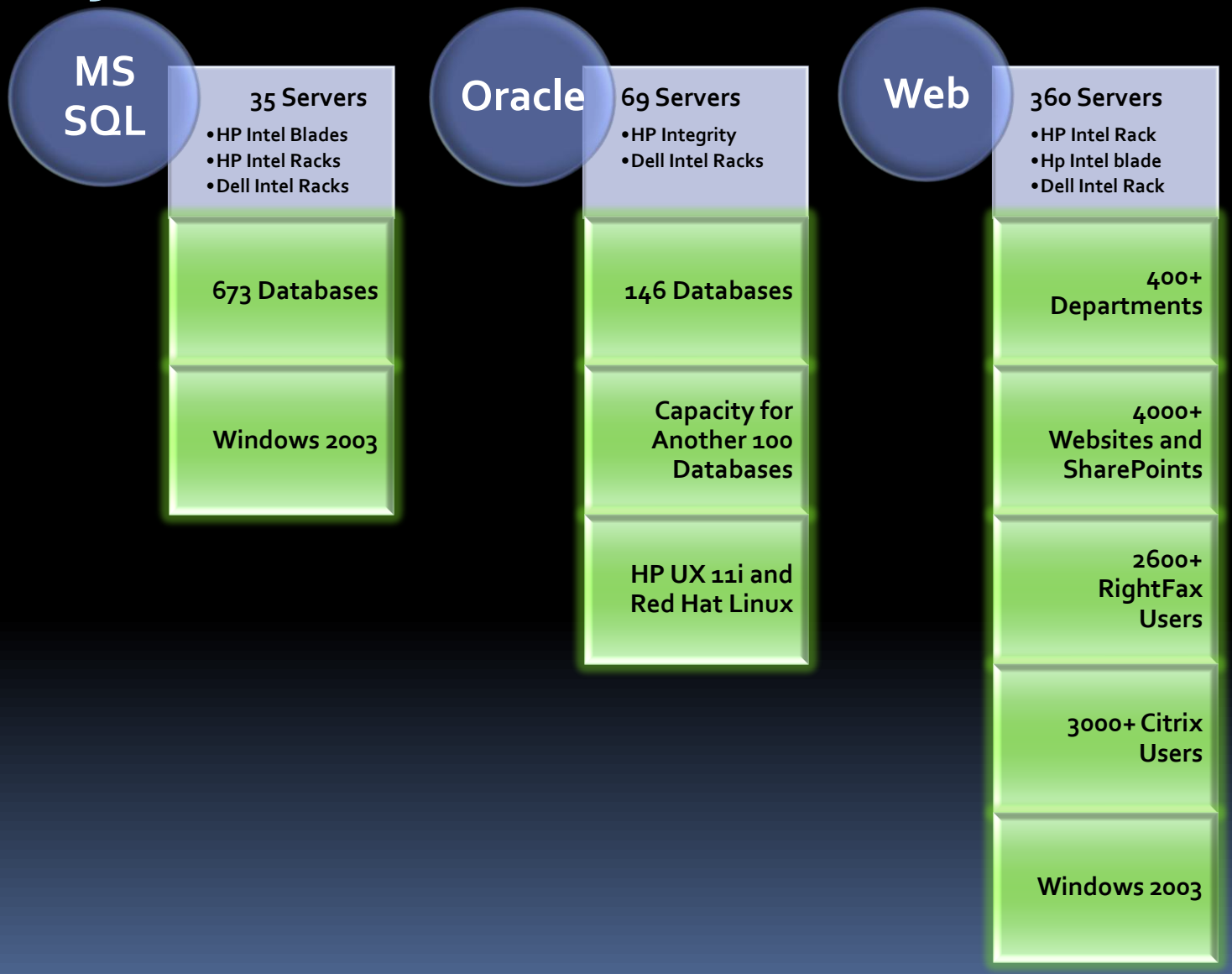
- Most Citrix and Right Fax Satisfied by Shared Environments
- Most of XXb Web Hosting (non Digex) on Shared Environments
- Capacity Managed by OPS

XXb Oracle Farms

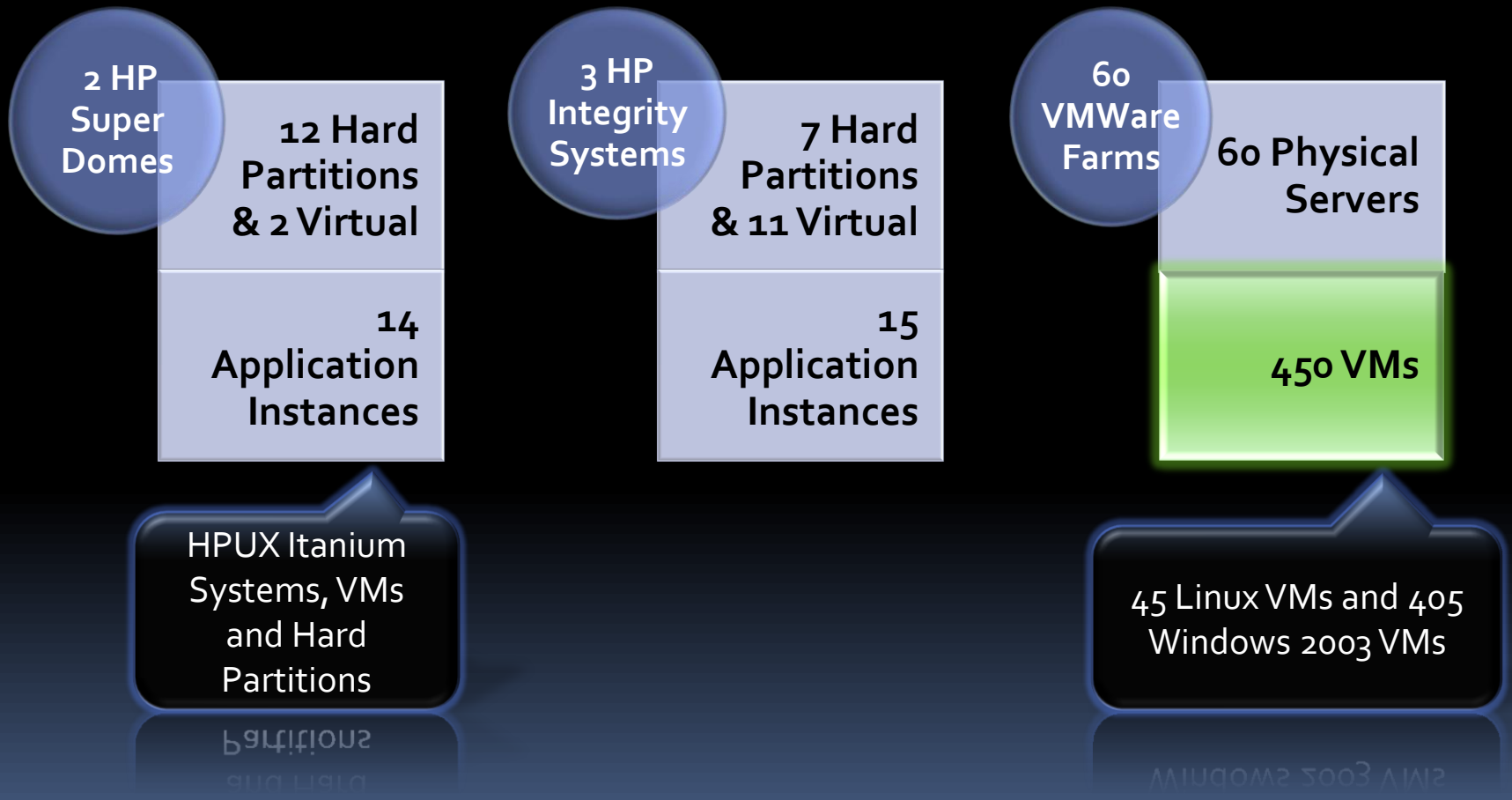
- High Performance Midrange Shared Environments
- Intel Scalable and High Availability Systems
- Capacity Managed by XXb DBA Team

No Single Centralized Entity Manages Overall CPU and Storage Capacity, Trending or Long Term Financial Requirements

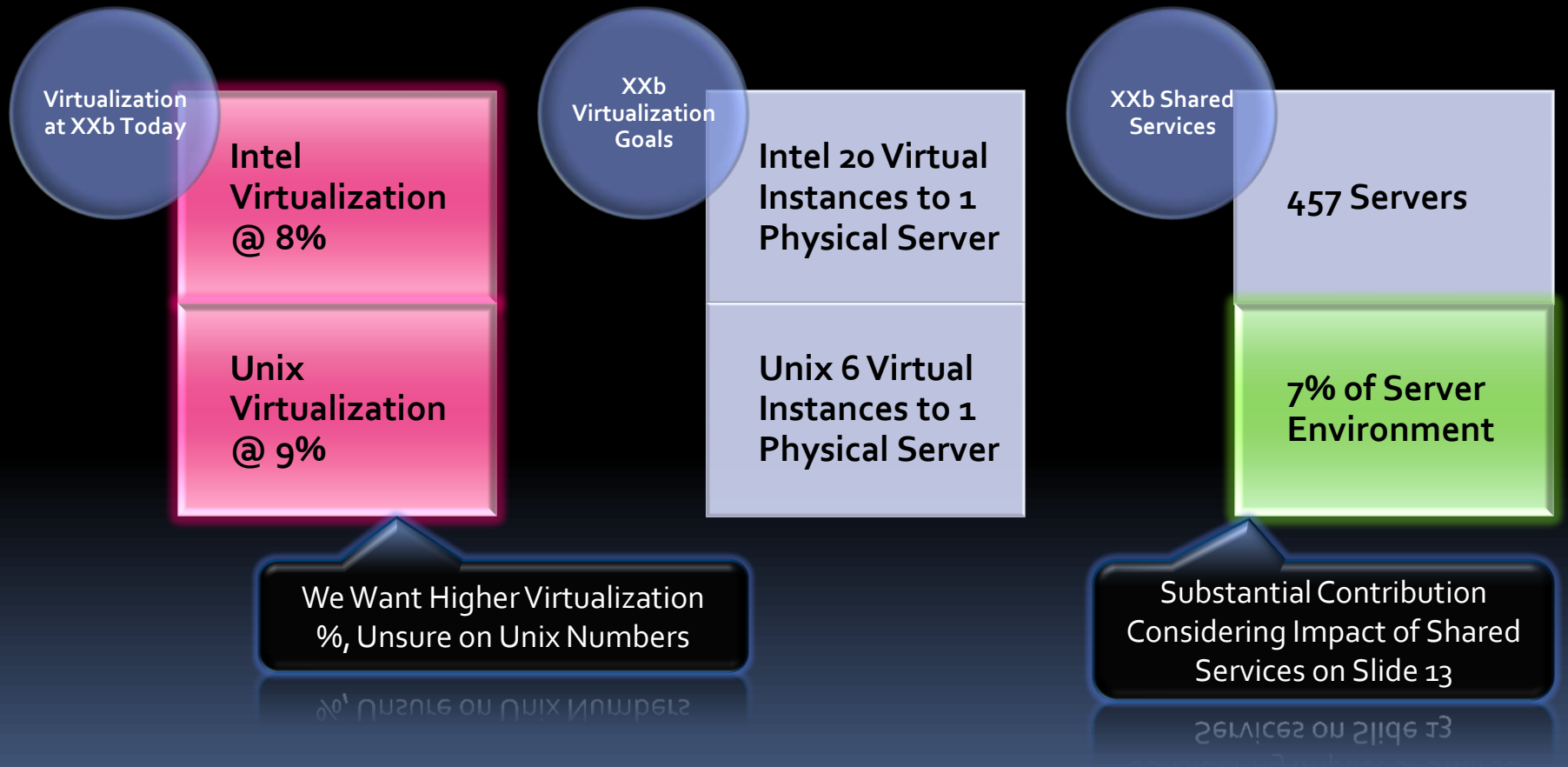
Today's Situation – Farms



Today's Situation – Shared Services



Today's Situation Shared Services Counts

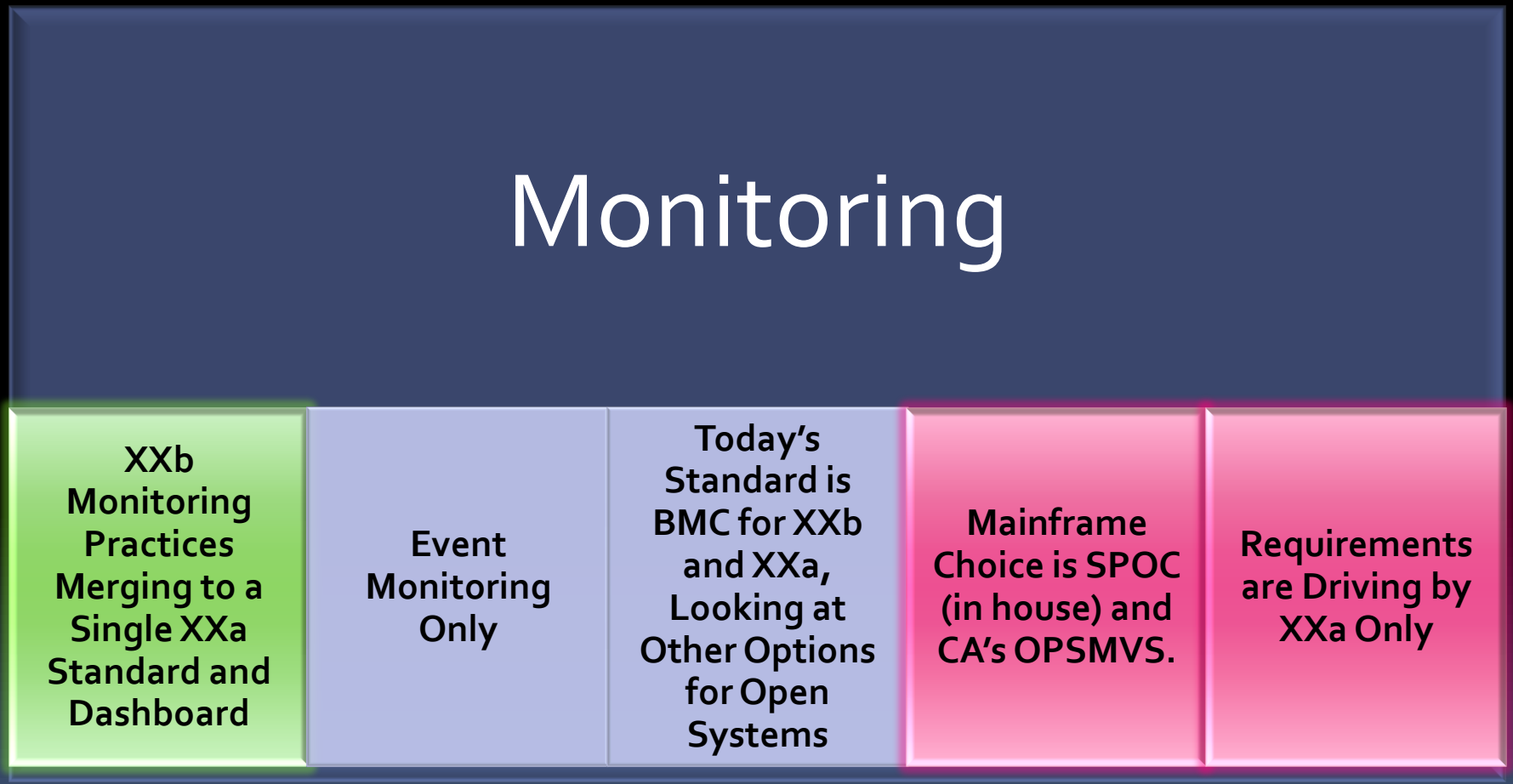


Today's Situation – XXb Inventory

Inventory Control

ASST Mgmt for XXb Utilizing Feeds from AI, Manual Methods and Interface with Application Information	ProdA for OPS with No Current Interface with Detailed Application Information and Feeds form Tivoli (Unix) and SMS (Intel)	ProdB Used for COD Prior to ProdA. Mainly Utilized by ARCH Organization to Track New Inventory	No Feeds Between ProdC and ProdA and Working on Manual Feeds from ASST Mgmt to ProdA	Working on ASST Mgmt and ProdC Feeds	3 Inventory Tools, Various Manual Feeds and Interfaces

Today's Situation – XXb Monitoring



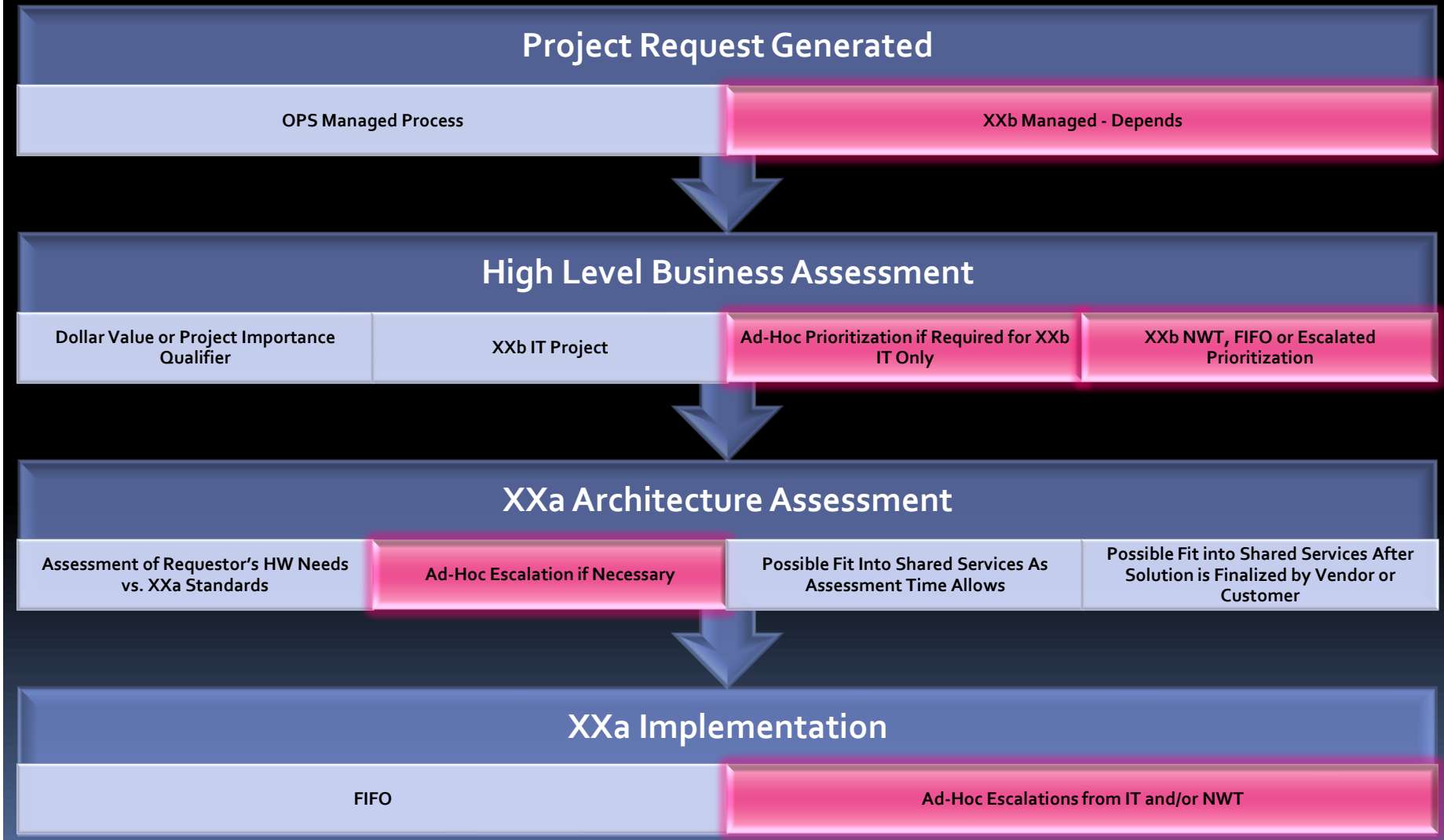
Today's Situation – XXb Capacity Planning

XXb Global Capacity Planning Scope and Reporting

	Performance Analysis	Trending & Reporting	Overall Dashboard
By Segment	✗	✗	✗
By VP	✗	✗	✗
By OS	✗	✗	✗
By Functionality	✗	✗	✗
By Data Center	✗	✗	✗
By Vendor	✗	✗	✗
By Application	✗	✗	✗
Ad-Hoc Request	✓	✓	✓

No Current Effort to Bring Capacity Planning to XXb Infrastructure. Previous XXb Project to Bring True Capacity Planning Has Been Halted by XXa @ a Cost to XXb of $2m and 1 Year of Development and Planning (4FTE Over 1 Year's Time)

Current XXb Infrastructure Request Process



Summary of Current State

- XXb Infrastructure
  - Matured Farmed Subset of Shared Services
  - Small Application Virtualization Footprint
  - No Centralized Entity Overseeing Current Shared Services
- Processes
  - Gap Between XXb Needs and Current XXa Approach
  - Lack of Global Infrastructure Request Processes
  - XXb NWT Being Isolated
- Metrics
  - Only Ad-Hoc Performance Request Available
  - No Plans from XXa for XXb Capacity Planning
  - Lack of Feedback From XXb For Monitoring or Capacity Planning
  - Various Non Interconnected Inventory Directions

Process

RECOMMENDATIONS

Available Options

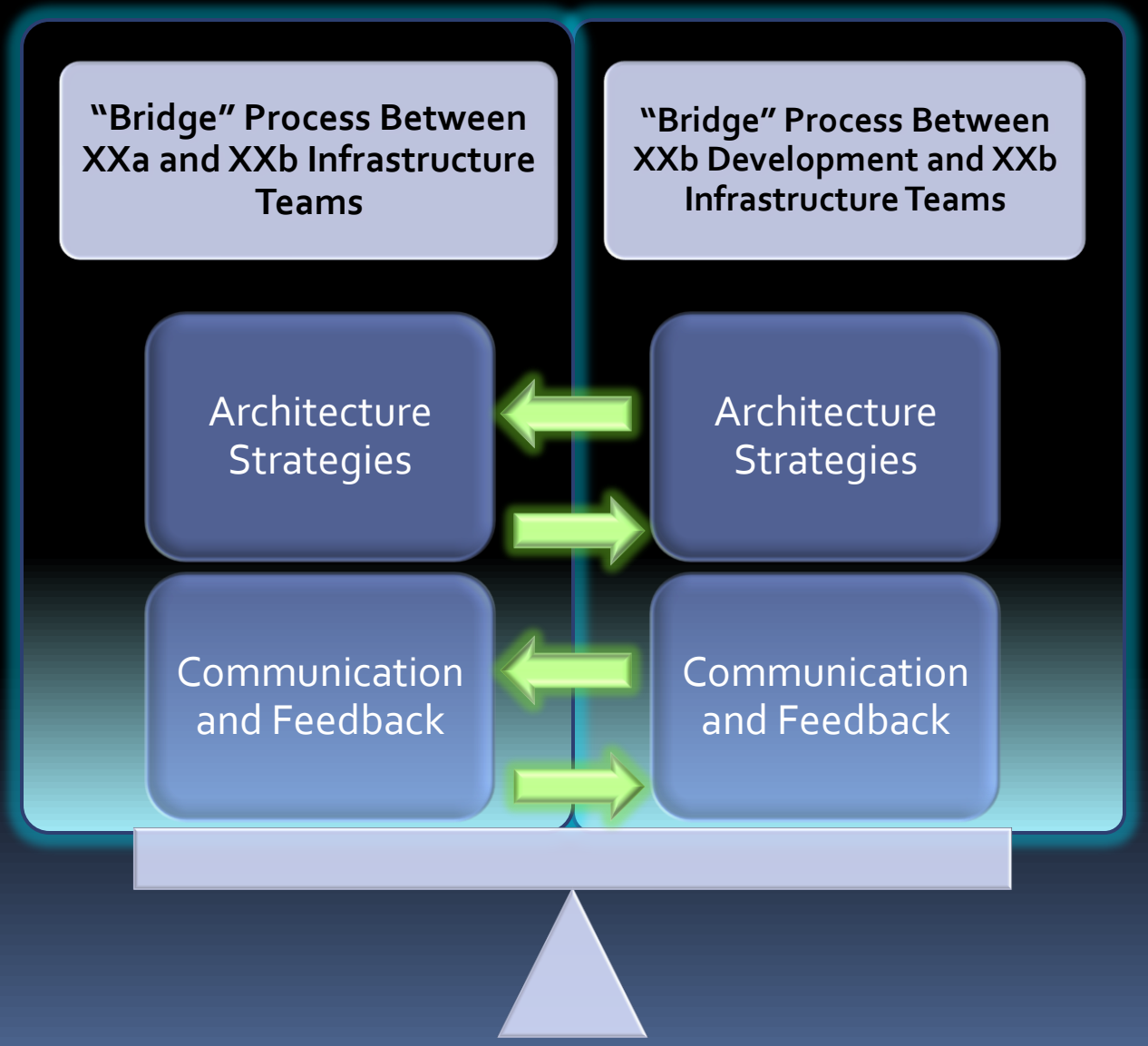
Adhere to Direction, Processes and Standards from XXa

- Benefits
  - ARCH/OPS would benefit from one set of standards
  - Easier XXa Process Integration for ARCH/OPS
- Risks
  - XXa direction, processes and standards not flexible due to nature of XXb
  - Cost associated with blanket standards
  - Global mandates from XXa based on downtime risk not criticality of application

Provide and Manage Detailed Requirements from XXb

- Benefits
  - More flexible and dynamic standards benefits XXb environment
  - Lower cost
  - Faster project implementation
- Risks
  - More resource intensive for XXb to manage
  - Create initial work for ARCH and OPS

Process Recommendations



“Bridge” Process XXa and XXb

XXb Infrastructure Requirement Generated from IT and NWT

- **Existing or New Growth**
- **Shared Services Growth/Enhancement**

IT and NWT Pre Deep-Dive Process (Modified)

- **Justification Understood and Approved**
- **Project “Scrubbed” Through Shared Services Long/Short Term Criteria**
- **“Weight Factor” Prioritization**

New “Scrubbed” Requirement is Clean, Justified and Prioritized for Faster Processing

- **ARCH Approval and Assessment is Expedited**
- **Benefits ARCH/OPS and XXb**

Responsibilities Detail on "Bridge" Process Between XXa and XXb

Responsibilities of "Bridge" Process (Owners{requirements or project})

Capacity Planning

- Trending
- Capacity Planning
- Reporting
- Inventory

Strategy

- Interface with ARCH and OPS for future and current strategies
- Recommendation based on XXb footprint and feedback
- Major Project Level Assessment

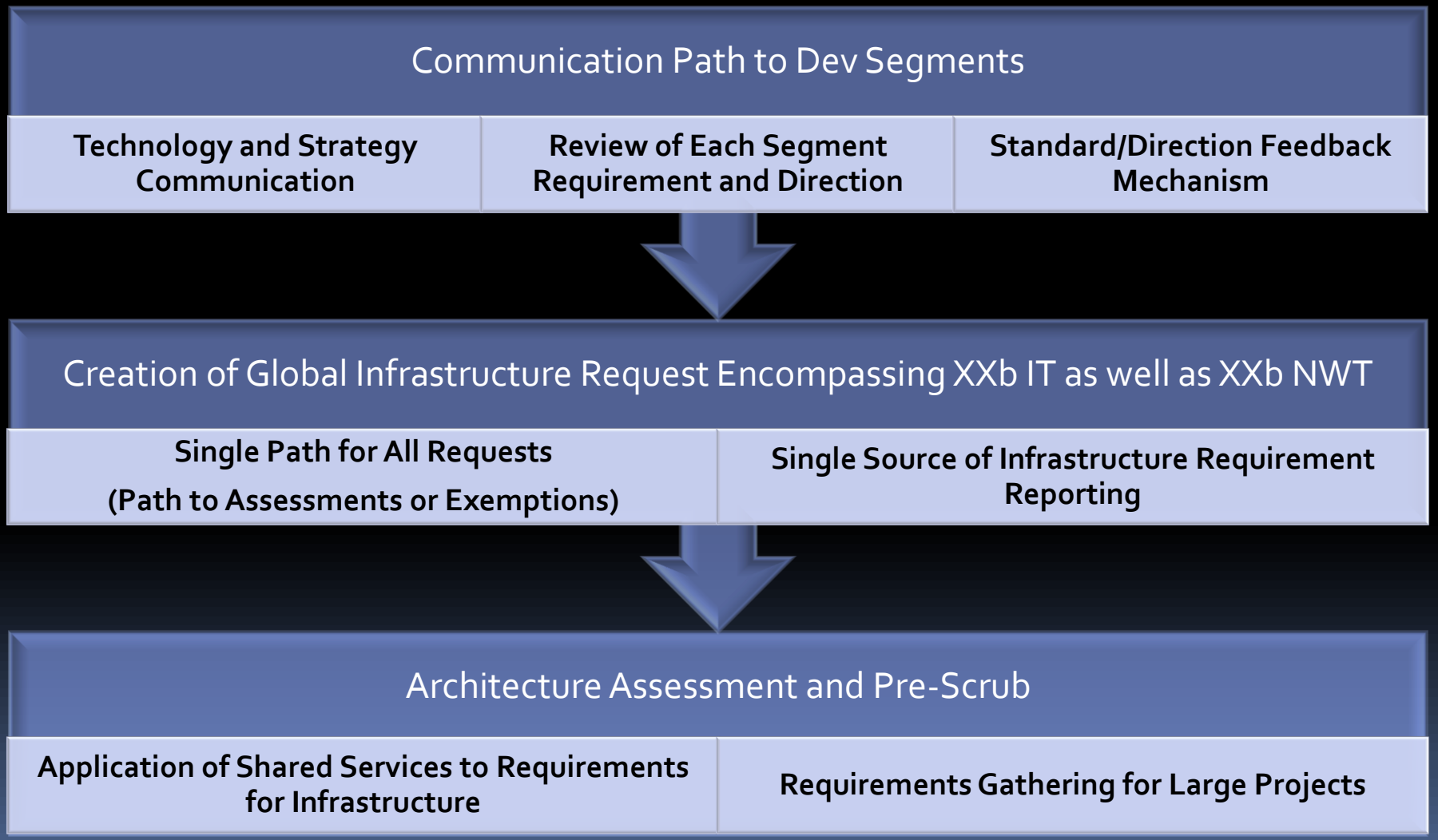
Financial

- Responsible for Silo and Shared Services Maintenance and Budget
- Chargeback Schema for Shared Services

Vendor (Expectation) Management

- XXa (ARCH/OPS)
- HW/SW Vendors

“Bridge” Process XXb and Dev



Responsibilities Detail on "Bridge" Process Between XXb and Dev (IT, NWT)

Responsibilities of "Bridge" Process (Owners)

Communication

- Identification of Dev POCs From Each Segment
- Share in Current and Future Roadmaps (HW and SW)

Strategy

- Understand IT, NWT Directions and Impact to HW/SW Infrastructure
- Recommendation based on XXb footprint and feedback

Financial

- Secure Funding for Shared Environments or Large Scale Projects from Departments
- Chargeback Schema for Shared Services

Process

- Process of Engagement Creation
- Feedback Mechanism Between IT/NWT and XXa

Summary of Process Recommendations

- Mgmt
  - Need XXb representation to match ARCH/OPS area of ownership to help drive XXb Global Requirements
  - Need to bring NWT into mainstream decisions and strategies as they apply to various NWT Environments
- Processes
  - Change Management for strategic direction required
  - CM needed between XXa and XXb
  - CM needed between XXb and NWT
  - Shared Services Needs to be a focal point of new processes

Technology OS and Strategic Approach

RECOMMENDATION

Details on Long, Short, Mixed Strategies

Long Term Strategic Approach

- Benefits
  - Risk Areas Fully Explored and Resolved
  - Long Term Changes to Dev Approach and Choices in Vendor, COTS, etc…
  - Less Dependence on HW Vendor if Linux is Chosen as Long Term Strategic OS Choice
- Risks
  - Short Term Savings Loss
  - Cost Associated with Large Scale Changes
  - Possible Future Limitations on Vendor, COTS

Short Term Strategic Approach

- Benefits
  - Quick Consolidation Savings and Cost Avoidance
  - Immediate Introduction to More Virtualization Practices
  - Wider Areas of Opportunities
- Risks
  - Short Term Savings vs. Long Term Savings and Direction
  - Risk Areas Not Fully Identified and Resolved
  - Propagation of Different Virtualization Techniques and Vendors

Mixed Strategic Approach

- Benefits
  - Short Term Cost Savings and Avoidance
  - Wider Areas of Opportunities
  - Long Term Plan for Limited OS Roadmap
- Risks
  - Risk Areas Not Fully Identified and Resolved
  - Short Term Propagation of Different Virtualization Approach
  - Possible Long Term Limitation on COTS

OS Migration Targets

Application Dependence Direction

	Short Term	Long Term		
OS	Choice	1st Choice	2nd Choice	3rd Choice
HP UX	HPUX	Solaris	Linux	AIX
Tru64	Tru64	Linux	Solaris	AIX
OpenVMS	OpenVMS	Solaris	Linux	AIX
AIX	AIX	Linux		
Solaris	Solaris	Solaris		
Windows	Windows	Windows		
Linux	Linux	Linux		

SW Functionality Dependence Direction

	Short Term		Long Term	
SW Function	1st Choice	2nd Choice	1st Choice	2nd Choice
Oracle	Linux	HPUX	Linux	AIX
SQL	Windows		Windows	
IIs	Windows		Windows	
DB2	Linux	AIX	Linux	AIX
Websphere	Linux	AIX	Linux	AIX
JBoss	Linux		Linux	
Weblogic	Linux	AIX	Linux	AIX
Apache	Linux	Solaris	Linux	Solaris

HW Type Targets (Long Term)

	Application Classification			
HW Functionality	Bronze or Silver	Gold or Platinum	Cluster Viable	Alternative
Windows Not VM Supported	Intel/AMD	Intel/AMD		
Windows	VM	VM		
Linux Stand Alone	Intel/AMD	Decision →	Yes	Intel/AMD
			No	P Series / P Series Farm
Linux	VM	Decision →	Yes	Intel/AMD Farm
			No	P Series Farm
AIX Stand Alone	P Series	P Series		
AIX	P Series Farm	P Series Farm		
Solaris Stand Alone	SPARC	SPARC		
Solaris	Containers, Domains	Containers, Domains		

This Approach Leaves XXb in a Long Term Strategic HW Roadmap Comprised of SPARC, Intel/AMD and P Series

Vendor Choice Between HP, IBM, SUN, Dell, Fujitsu

Mixed Strategic Approach

Mixed Strategy Approach

- Leverage Short Term Savings and Cost Avoidance
- Introduction to Long Term Development Changes in Application Choice and Methodology
- Allows Maturity of Other Technologies
- Benefits Security and Network for Long Term Changes in Today's Network Security Guidelines

XXb Global Capacity Planning Scope and Reporting Required

Present Requirements for Global Capacity Planning and Reporting to XXa and Evaluate LOE and Cost provided by XXa vs. Cost and LOE Spent on Previous XXb Capacity Planning Project Currently On HOLD Status

Summary of OS and Functionality Roadmaps

- Mixed Strategic Initiative
  - XXb needs a flexible short and long term strategy
  - Strategy needs to be assessed against long and short term savings and technological direction
- Choices OS/Functionality/CP
  - Choice of long term OS between Linux/AIX and Solaris
  - Short term choice should be open to all major vendors
  - Both short and long term strategies need to be founded on a solid capacity planning foundation
  - Requirements need to be communicated to XXa and assessment on previous projects needs to evaluated against LOE to be provided by XXa once requirements are communicated

Shared Services (Virtualization & Farming) Concepts and Overall Fabric

RECOMMENDATION

Shared Services and Farming Concepts and Overall Fabric

- Next few slides will attempt to communicate the concepts of shared services
  - Functionality Farm
  - Virtualization Farms
  - Risk associated with each farm
  - Benefits of each farm
- Architectural concept of the entire presentation into a XXb Shared Services Framework Fabric and Next Steps
  - How XXb SSFF is constructed from virtualization, farming and process endeavors into a self sustaining fabric
  - Next Steps

Typical Virtualized Host Concepts

Operating System Details

- Most are Independent of Hosted OS Stack*
- Solaris is Exception Today
- All Include a Virtualization "Hypervisor" Underneath Hosted OS

Shared Physical Resources

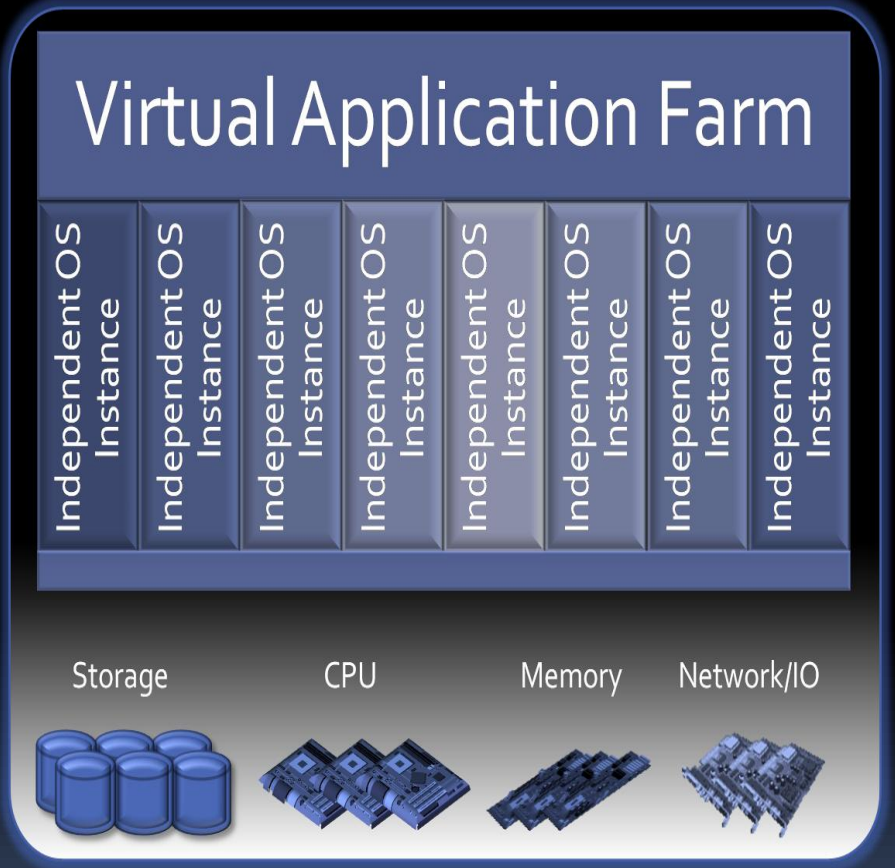
- Storage
- CPU
- Memory
- Network/IO Subsystems*

Management

- Centralized Resource Mgmt
- Network Consolidation*

Typical Footprint

- Not Large SAN Requirements
- Not High IO Requirements
- ISV Validation Might Be Required



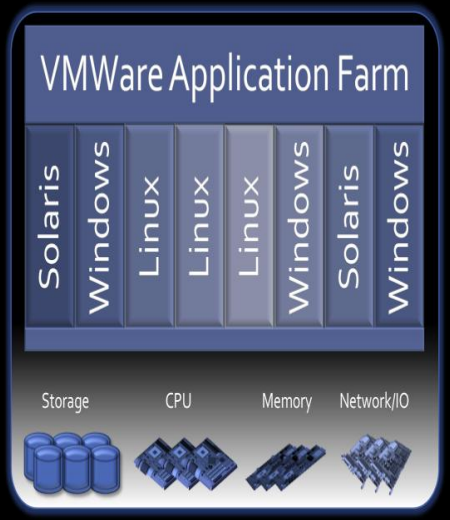
Application Farms - Details

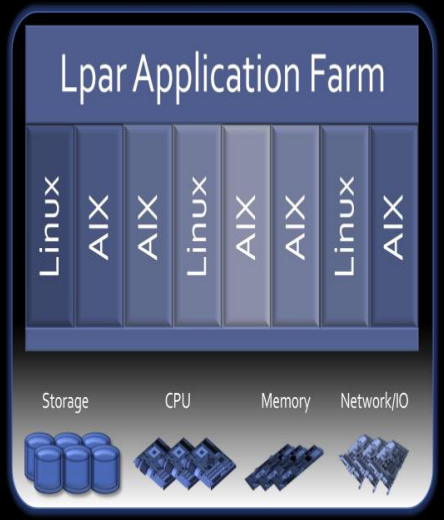
Heterogeneous Virtualization

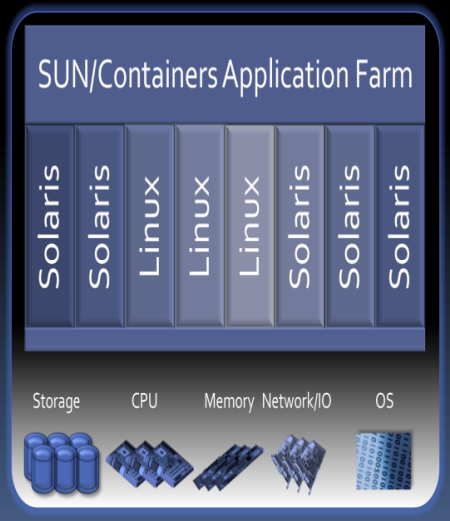
- Mixed Architecture, Management and Approach
- Tackle More Environments
- More Overhead from Mgmt, Monitoring and Performance Analysis Perspective *

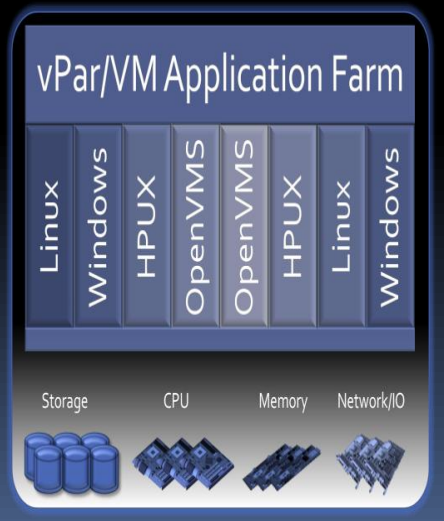
Homogenous Virtualization

- Less Choices
- Possible Long Term Control Gain over Developmental Approach
- Less Overhead from a Mgmt, Monitoring and Performance Analysis Perspective *









Virtualization Risks

Network and Security

- DMZ and SSN Not Allowed and Can't Span Networks
- Internal Switch Required on Some Technologies Not Allowed by IDN

Licensing

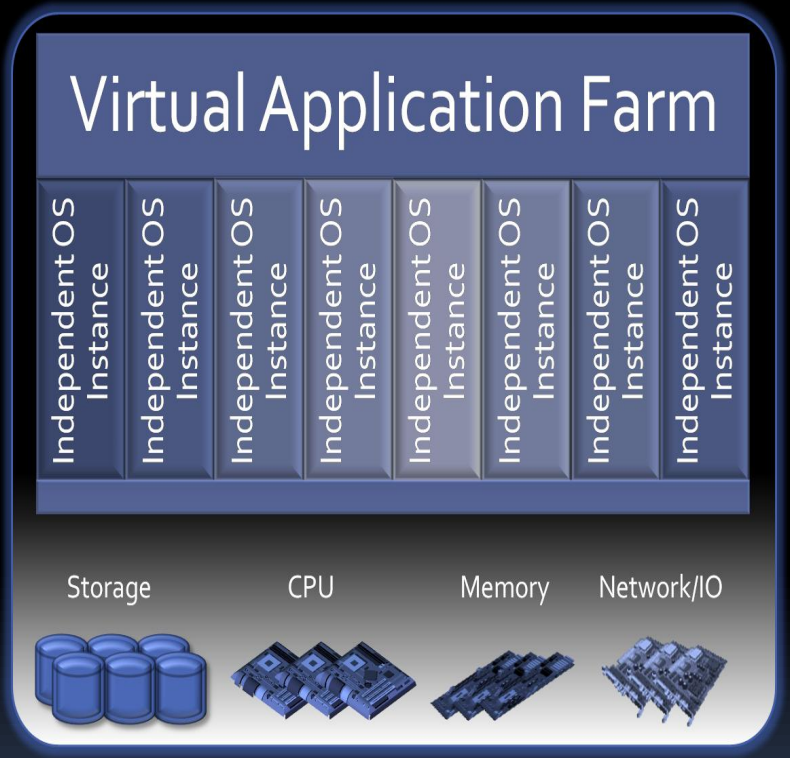
- Functional Use Best fit for Application Only Requirements
- 3rd Party Layered SW Needs to Be Closely Examined
- Virtual Instances Charge by CPU (Multi Core Approach Risk)
- Re-Use Must Be Closely Monitored

Management

- Departments May Have Different Access Criteria
- Difficulty in Consolidation Access in Specific Government – Type Departments
- ISV Validation Critical for Short and Long Term Strategies

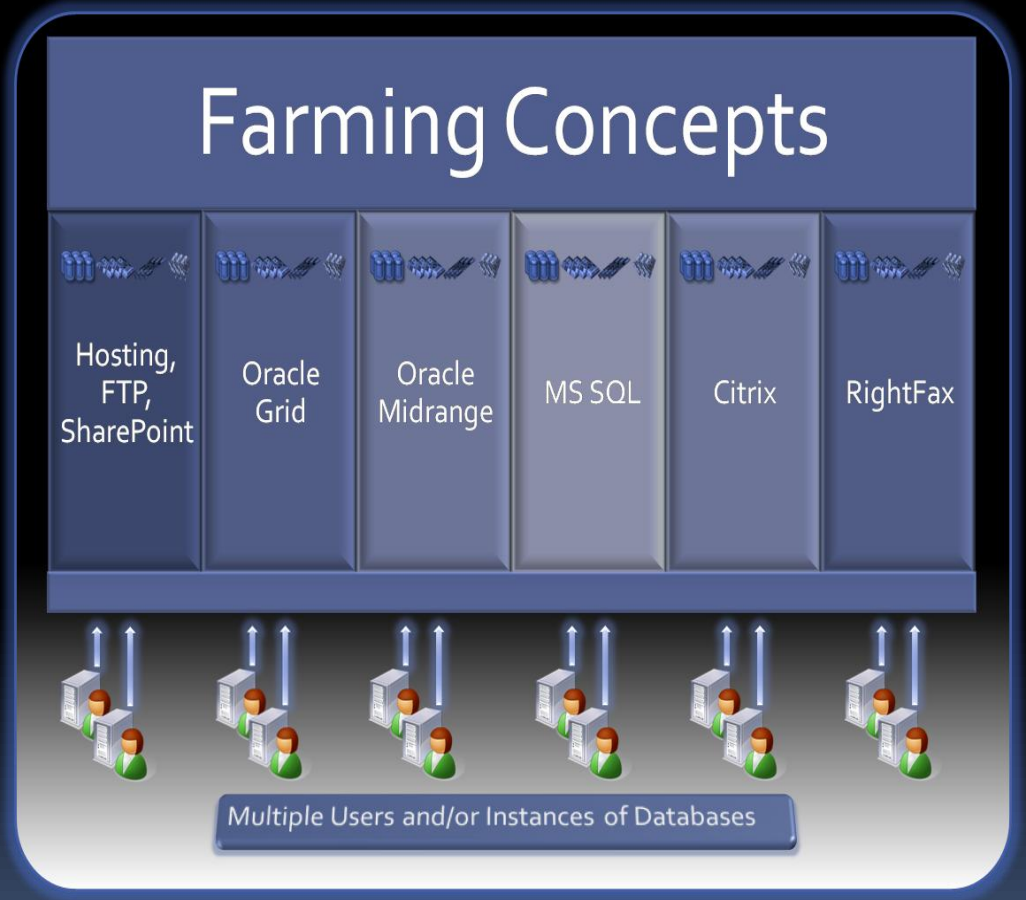
Financial

- Financial Question Need to Be Answered
- Asset Ownership
- Chargeback Mechanism Needed Before Massive Proliferation of Technology

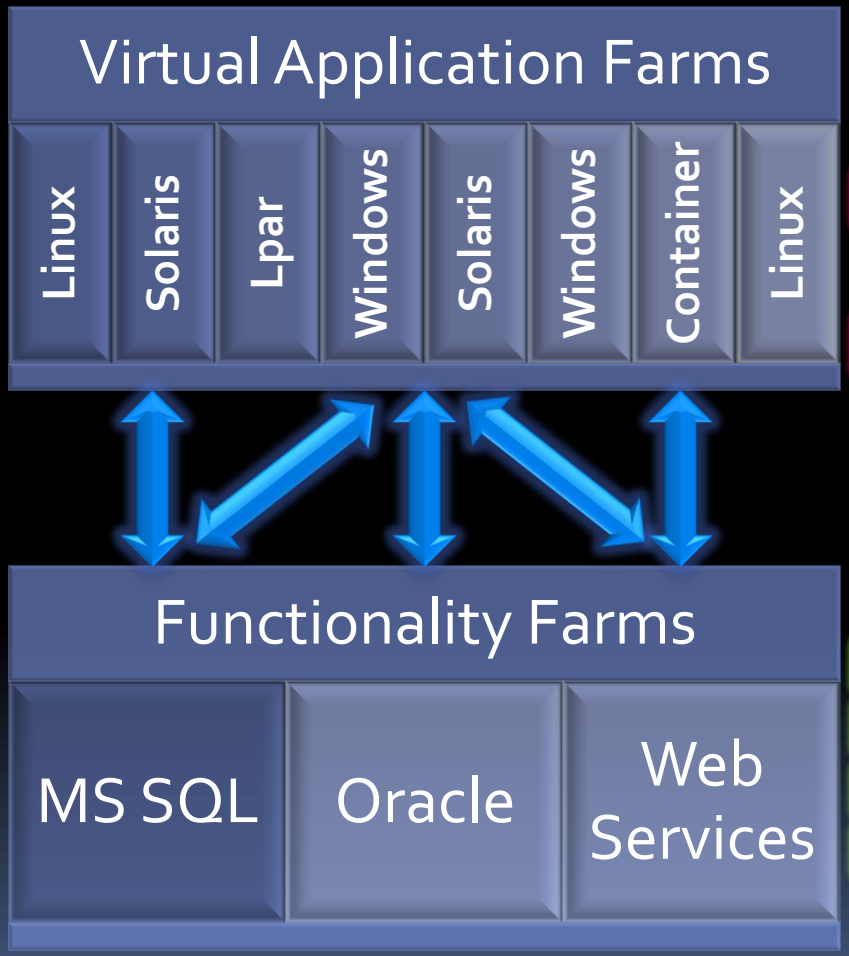


Farming Concepts

- Single Instances Share Resources At Instance level
- Single OS (Reduce "OS" Sprawl)
- Less Maintenance
- More Discipline
- Savings of Consolidation
- Savings from Maintenance
- Capacity Planning is Key
- Need Financial Model
- Network and Security "Friendly"



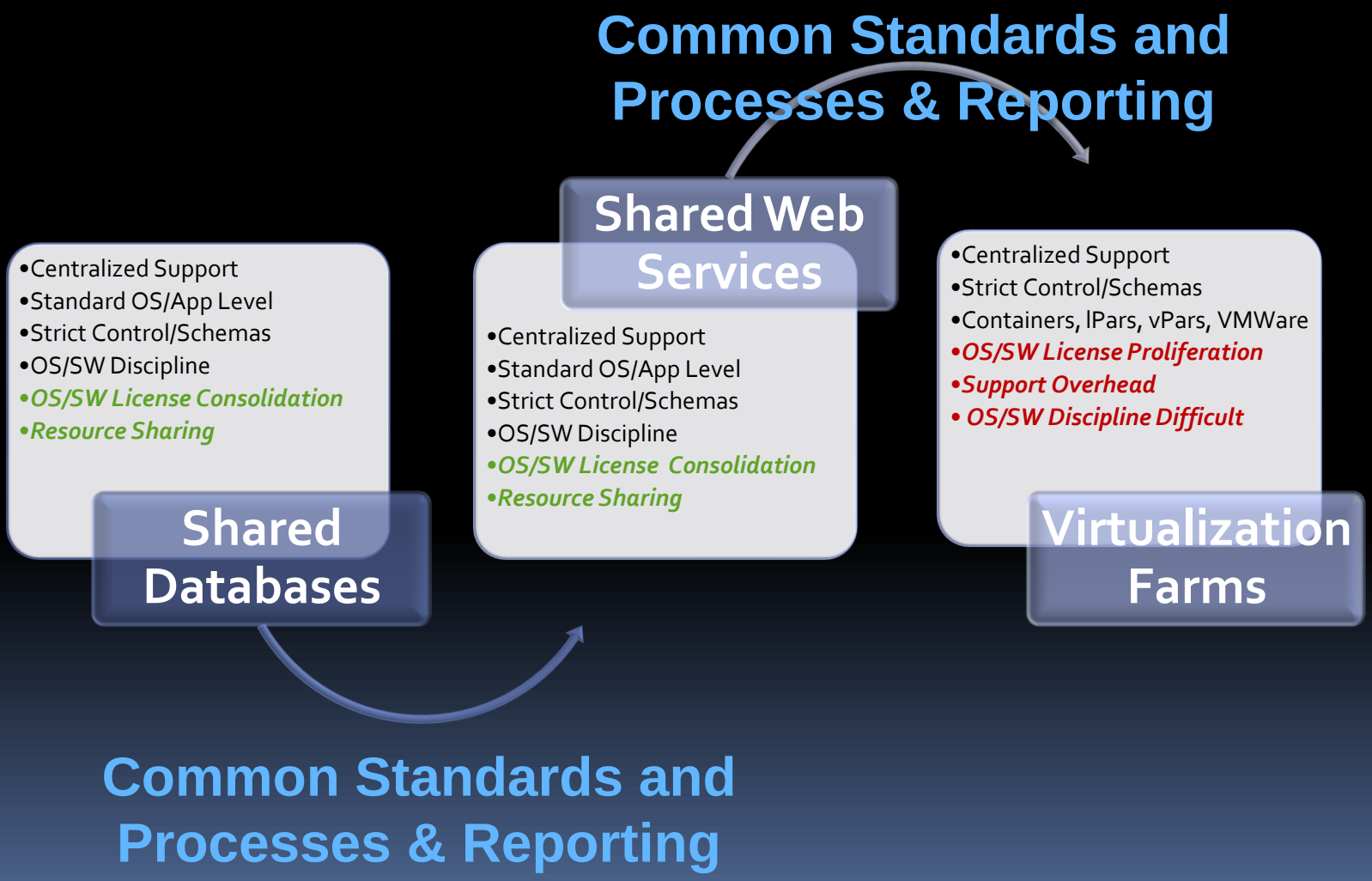
Farms & Virtualization Fabrics



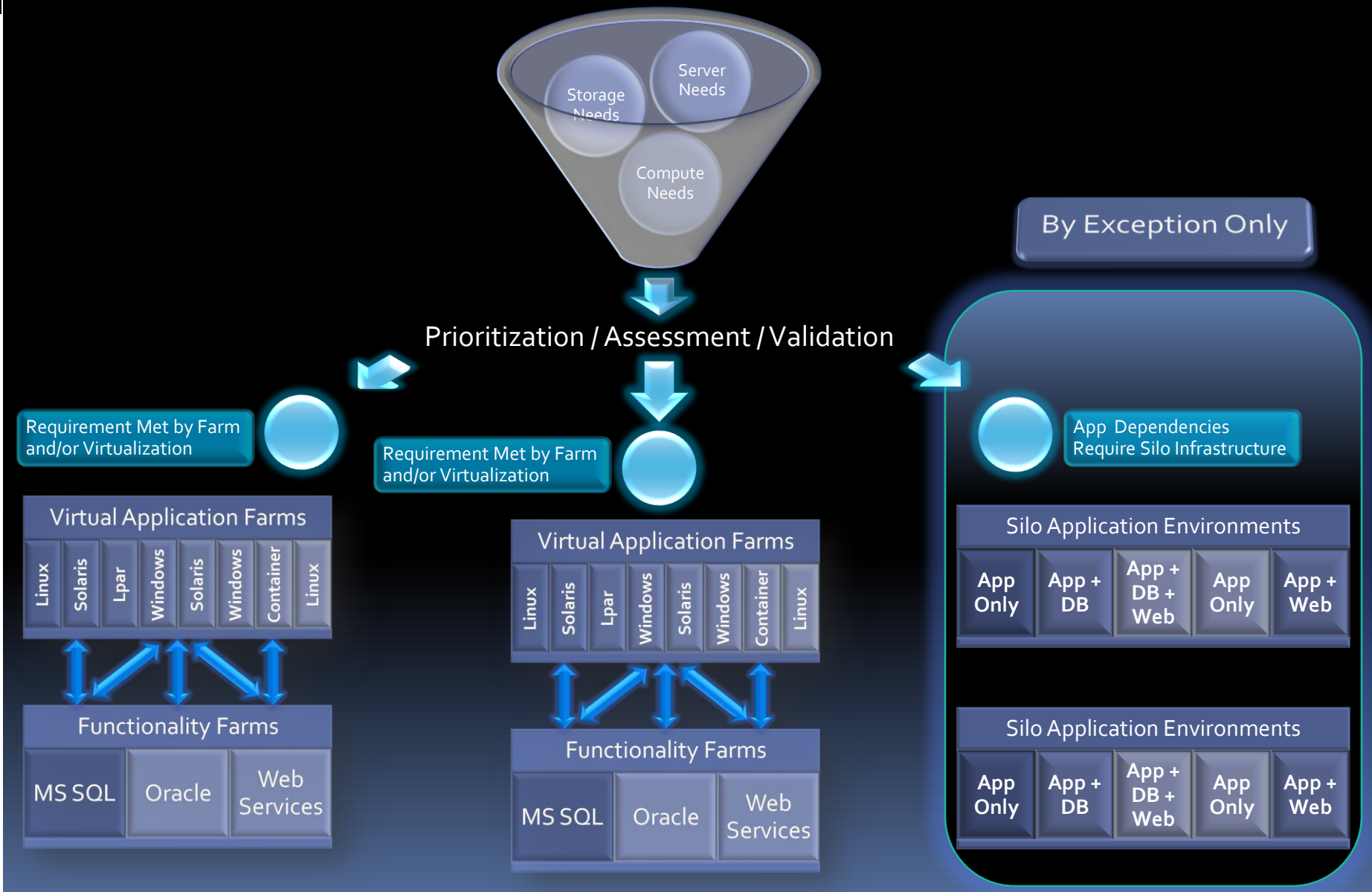
- Leverages SOA : Separation of App/DB/Web Requirements
- More Efficient (Easier to Return Unused Resources)
- Increase Cost of 3rd Party Layered Product
- Allows for Virtualization from Different Vendors
- Operational Overhead If Environment Not Treated as a Fabric

- Builds on SOA Approach
- More Efficient (Easier to Return Unused Resources)
- Cost of 3rd Party Layered Product Savings
- Strategic Changes in Vendor Do Not Affect Farms
- Vendor Agnostic
- Operational Optimization If Treated as a Consolidated "Fabric" To Manage

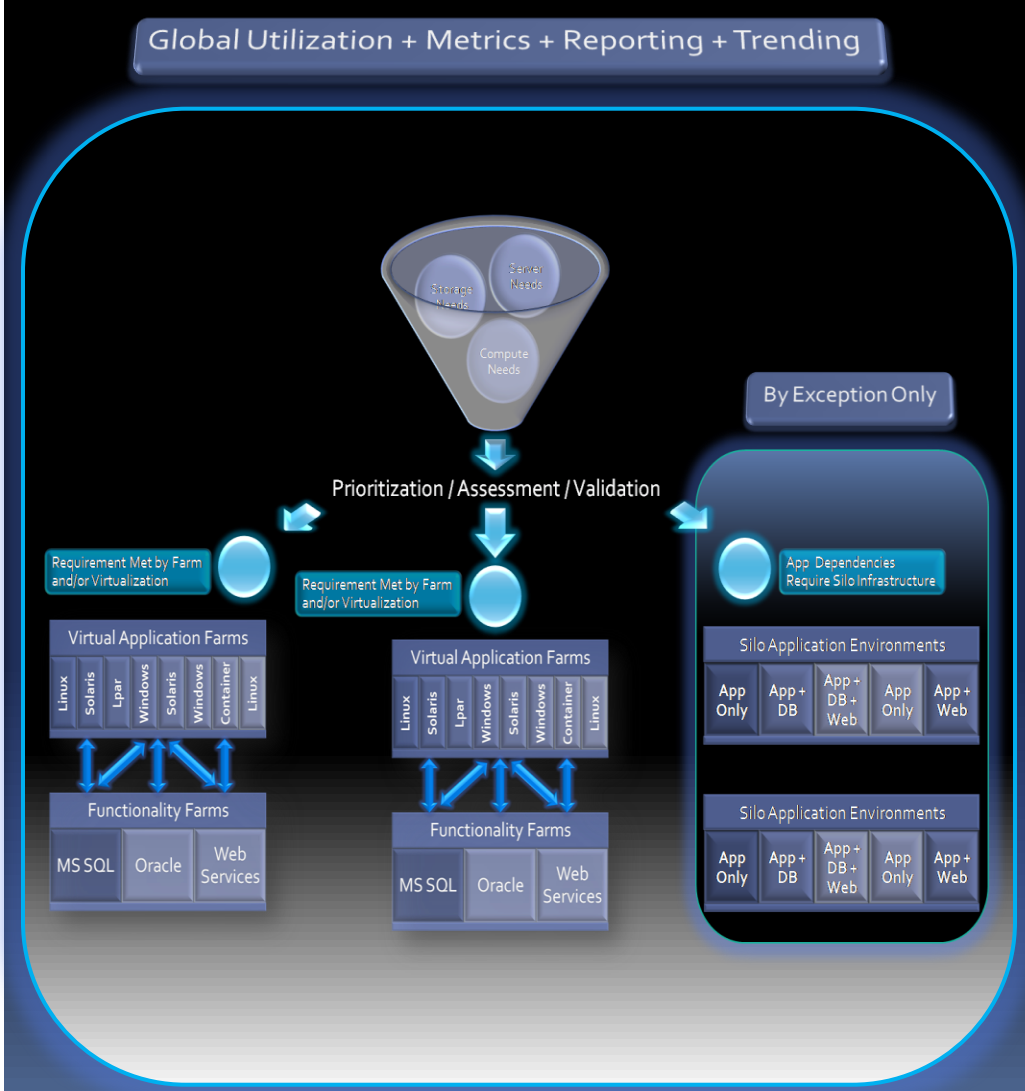
Architectural Concept/Benefits



Demand & Fulfillment Process Fabric



D&F Process Fabric + Capacity Planning



Global Dashboard/Capacity Planning

Reporting

- By Mgmt (VP, Mgr, sVP, Director, etc…)
- By Segment (Sales, Marketing, Networx, etc…)
- By Technology (OS, HW, Functionality, etc…)
- *Interface with Inventory (ASST Mgmt)*

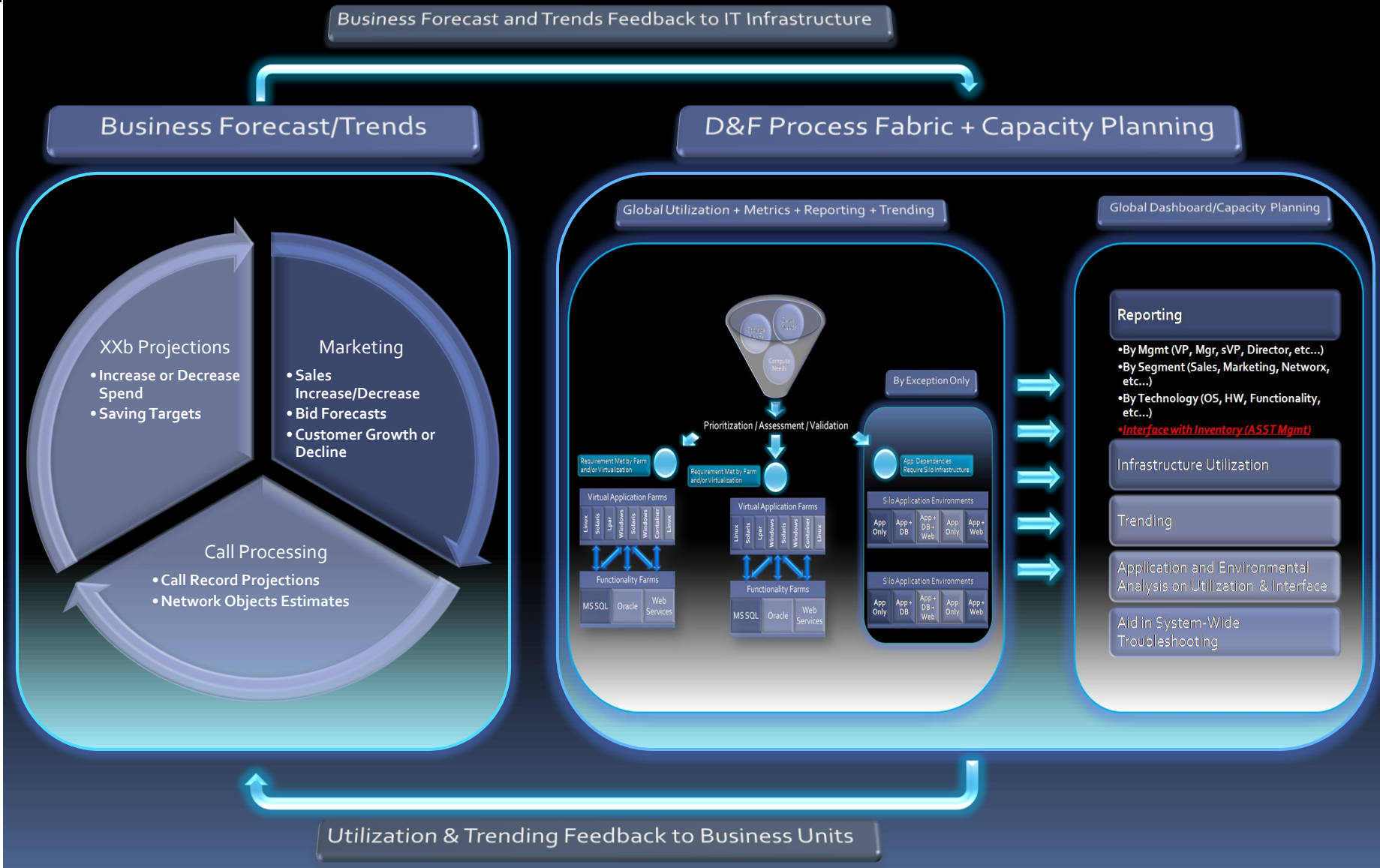
Infrastructure Utilization

Trending

Application and Environmental Analysis on Utilization & Interface

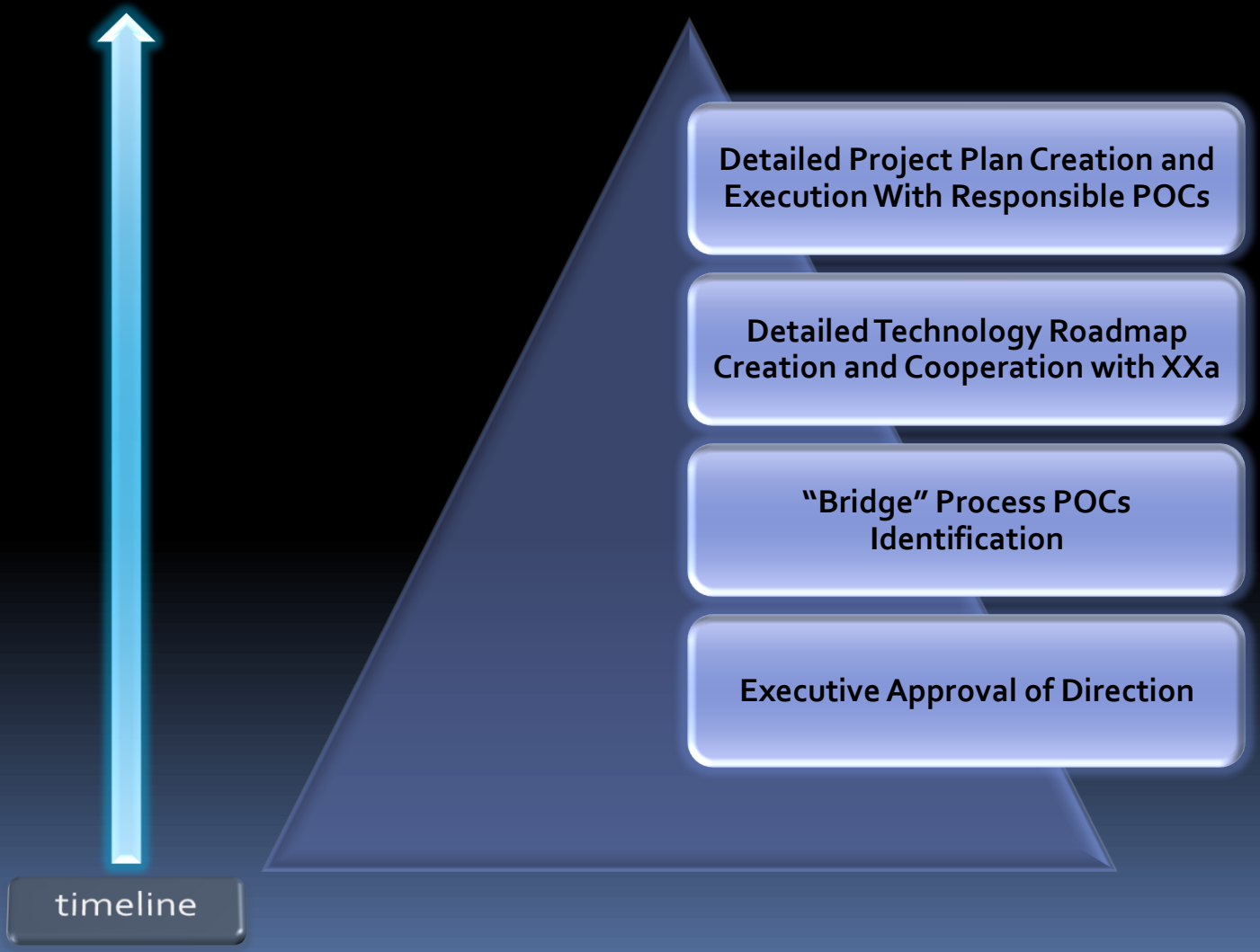
Aid in System-Wide Troubleshooting

XXb SSF (Shared Services Framework)



NEXT STEPS

Next Steps


Detailed Project Plan Creation and Execution With Responsible POCs
Detailed Technology Roadmap Creation and Cooperation with XXa
"Bridge" Process POCs Identification
Executive Approval of Direction
timeline