



Virtual Desktop Infrastructure

– Efficiency, Stability, Cost Savings –

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Virtual Desktop Infrastructure

- Overview
- Challenges
- Opportunities
- Project Approach
- Next Steps
- VDI Considerations

Overview

- 3 Areas...
 - *Server Virtualization*
 - *Application Virtualization*
 - *Desktop Virtualization*

Overview

- **Server Virtualization**
 - *Multiple server operating systems (e.g. Windows Server 2003) delivered from single host server hardware to mimic the functionality of a physical server for application usage*
 - *VMWare ESX, MS Hyper-V, Solaris 10, AIX*

Overview

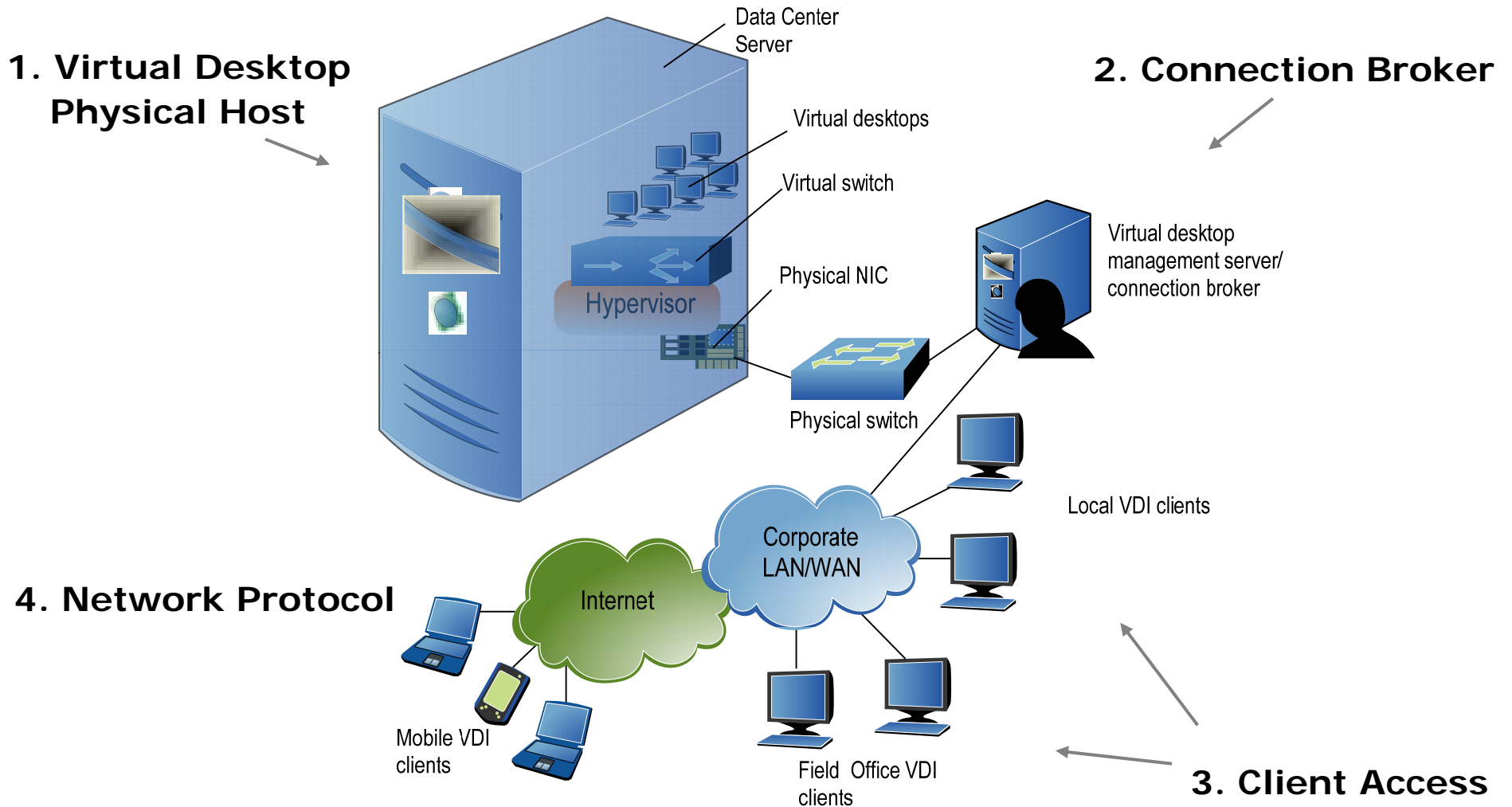
- **Application Virtualization**
 - *Multiple software applications (e.g. Microsoft Office) delivered from single server hardware to end users computers to mimic the functionality of an application running locally on the users desktop computer*
 - *Delivered via client software or browser plug-in*
 - *Citrix Presentation Server, MS App-V*

Overview

- Desktop Virtualization
 - *Multiple desktop operating systems (e.g. Windows XP) delivered from single host server hardware to end users to mimic the functionality of a physical desktop computer.*
 - *Delivered via client software or browser plug-in*
 - *VMWare View, Citrix Zen Desktop, MS Hyper-V*

Overview

Desktop Virtualization – Key Technology Components



Challenges

- 3 Areas...
 - *Application Complexity & Incompatibility*
 - *Server Optimization*
 - *Security Administration*

Challenges

- **Application Complexity & Incompatibility**
 - *Multiple operating systems*
 - *Significant amount of work to re-write applications to run on a single O/S*

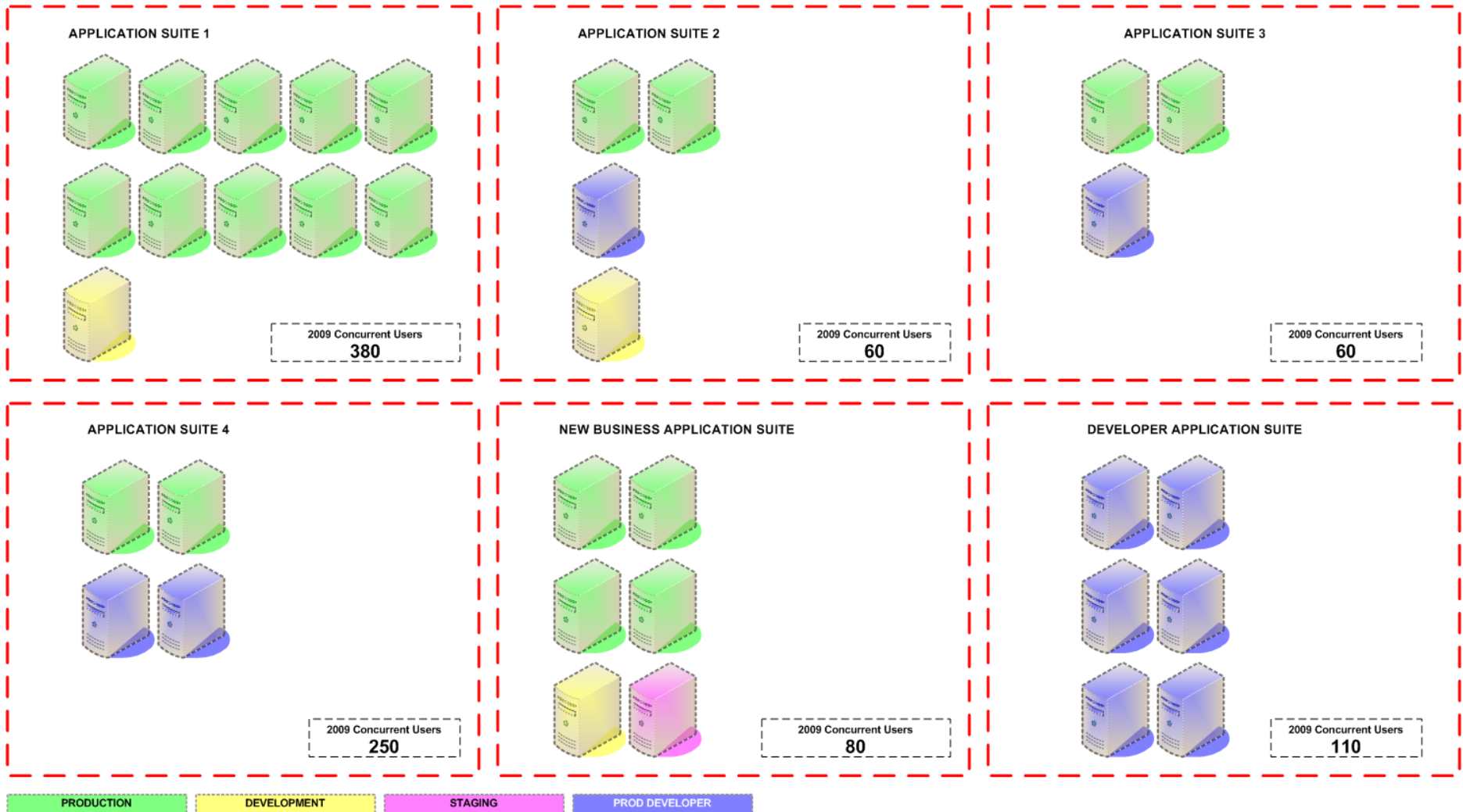
Challenges

- **Server Optimization**
 - *Citrix Presentation Server 4.x*
 - *Servers on 4 year refresh cycle, due in 2010*
 - *Reduce dependency on server operating system*
 - *Challenge to scale environment for rapid business growth or temporary peaks*

Challenges

- **Security Administration**
 - *Security rights for users, developers*
 - *Applying new GPO's seamlessly*
 - *Patching waves require constant testing cycles*
 - *Server resource hogging impacts ALL users (DOS)*

Challenges



Opportunities

- 3 Areas...
 - *User Benefit*
 - *Infrastructure Support Benefit*
 - *Cost Benefit*

Opportunities

- User Benefit
 - *Consistent look and feel for all users*
 - Developers
 - Inforce, New Business
 - *New user training simplified*
 - *Business user app requirements met more quickly*
 - *Improved environment stability*

Opportunities

- Infrastructure Support Benefit
 - *Consistent Win XP SP3 build across...*
 - Desktop, laptop, VDI image
 - Toronto, Boston, Field
 - *Applications have a consistent build document and are configured for same OS platform*
 - *Easier & faster scalability to meet business growth*

Opportunities

- **Cost Benefit**

- *Saves testing time after upgrades / patches*
- *Higher user density per server over current Citrix farm*
- *Reduced server operating costs*
- *Competitive advantage, easier & faster scalability to meet business growth*
- *Contributes to “green computing”*

Project Approach

- 3 Areas...
 - *Target Use Cases*
 - *Software & Tools*
 - *VDI Infrastructure*

Project Approach

- Target Use Cases
 - *Desktop Virtualization Candidates*
 - Knowledge workers (executive staff, analysts)
 - Process workers (customer service, claims and loan processing)
 - Data-entry workers (processing reservations, making order entries)

Project Approach

- Target Use Cases
 - *Not recommended*
 - High-performance users (local graphics processing)
 - Mobile users (significant offline use)

Project Approach

- Target Use Cases
 - *Use case scenario appropriate for VDI – Phase 1*
 - Application developers
 - 7 master image builds
 - *Proof of Concept to assess technology options*
 - *Define “Guidelines for Use”*
 - *Develop & document Reference Architecture*

Project Approach

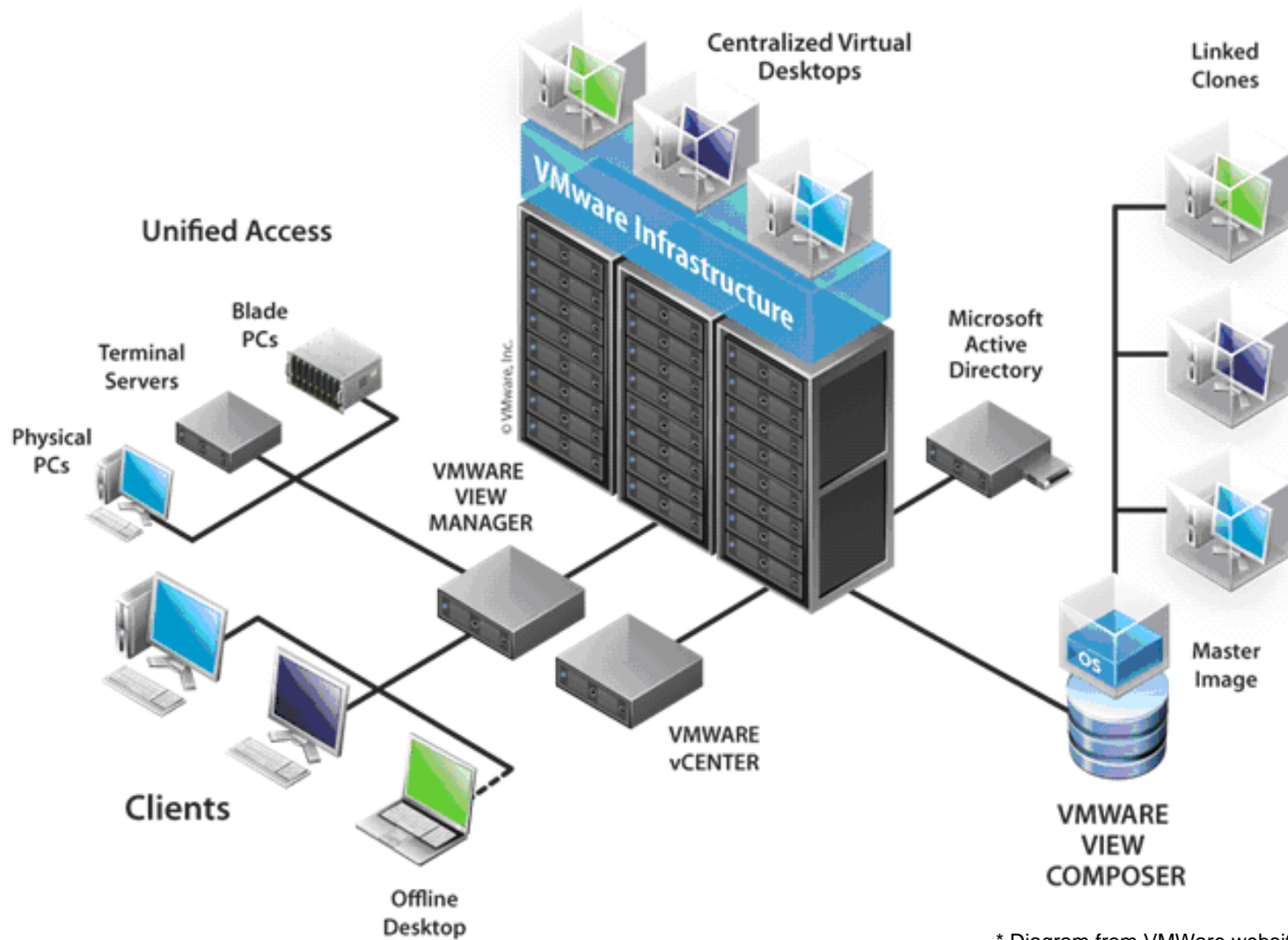
- **Software & Tools**

- *Attachmate, Rumba, Exceed*
- *Office 2003, Clearcase, Crystal Reports*
- *Business Objects, IBM WAS Developer, Informatica Power Centre, Visual Basic, Visual C++*
- *Easel, Vignette Dev Centre, Siebel Tools*
- *Mainframe Express, Power Builder...*

Project Approach

- VDI Infrastructure
 - *2 x IBM xSeries 3850 M2*
 - 96 gb ram, 4 CPU x 6 cores = 24 cores
 - 2.75 TB of SAN space
 - (1 x 750 gb for master images, 2 x 1 TB for clones)
 - *VMWare ESX 3.5*
 - VMWare View Premier 3.5, Composer, View Client

Project Approach



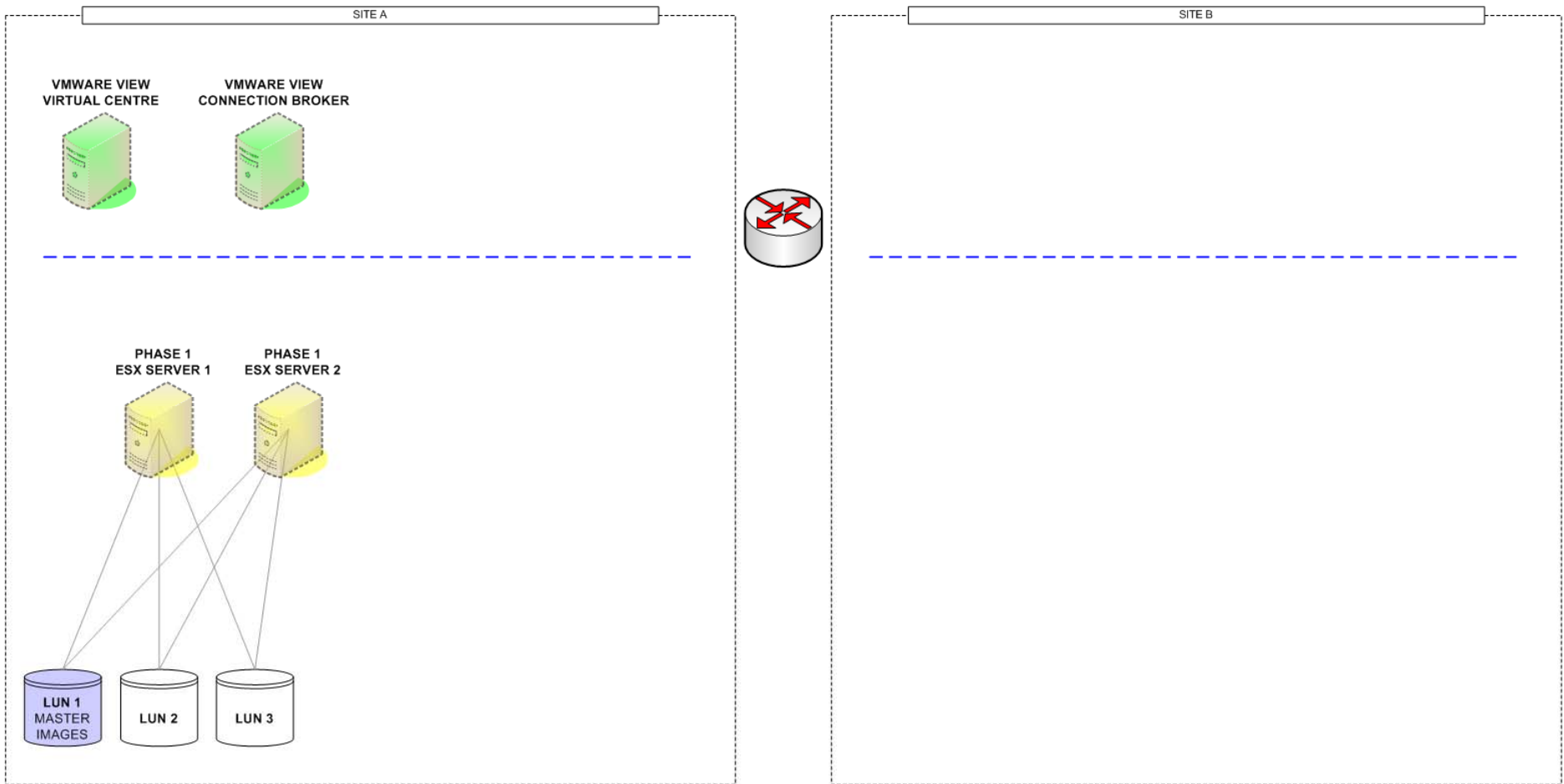
* Diagram from VMWare website – www.vmware.com

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Project Approach

VDI PHASE 1 – DESIGN VIEW



PHYSICAL HOST SERVER

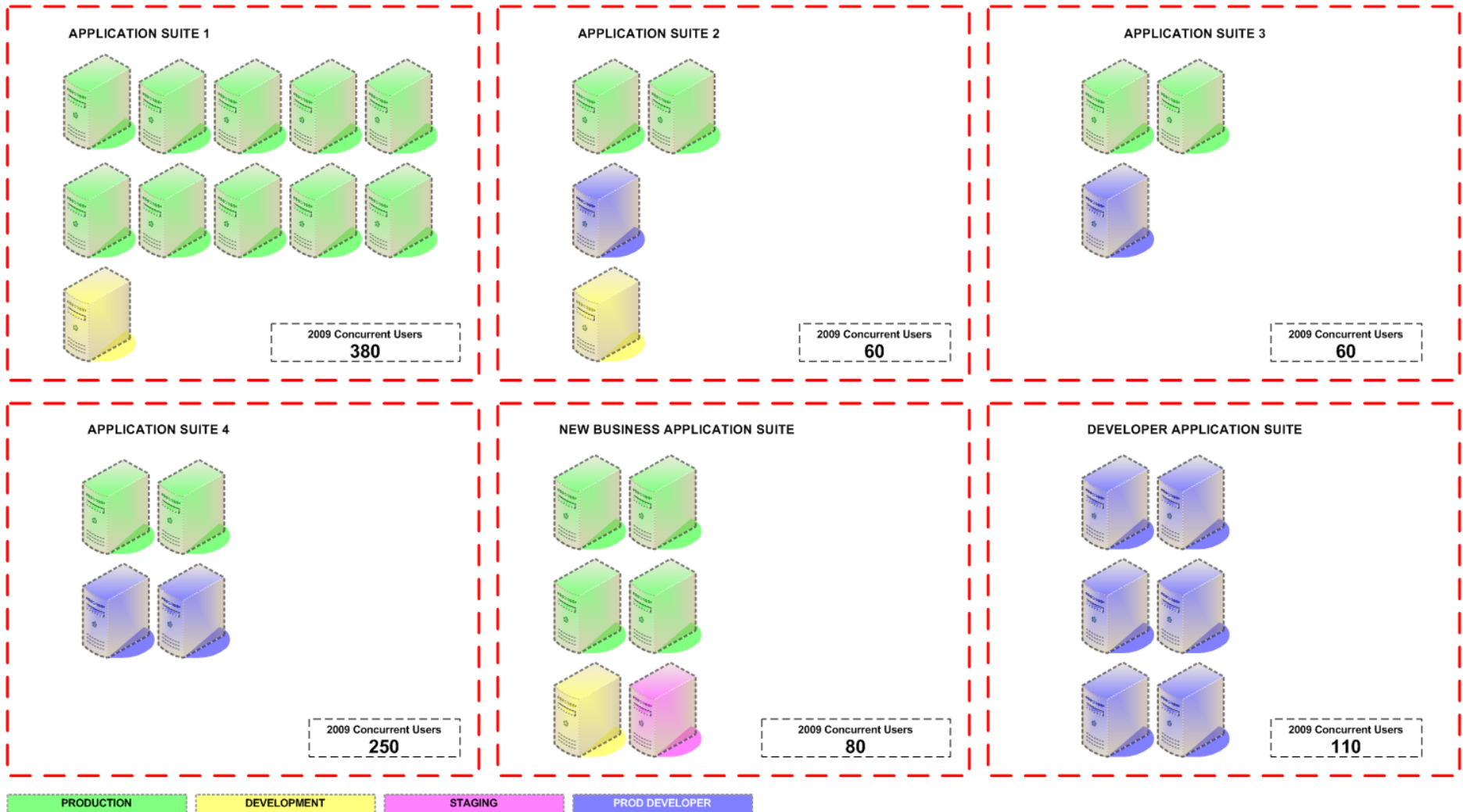
VIRTUAL SERVER - ACTIVE

VIRTUAL SERVER - PASSIVE

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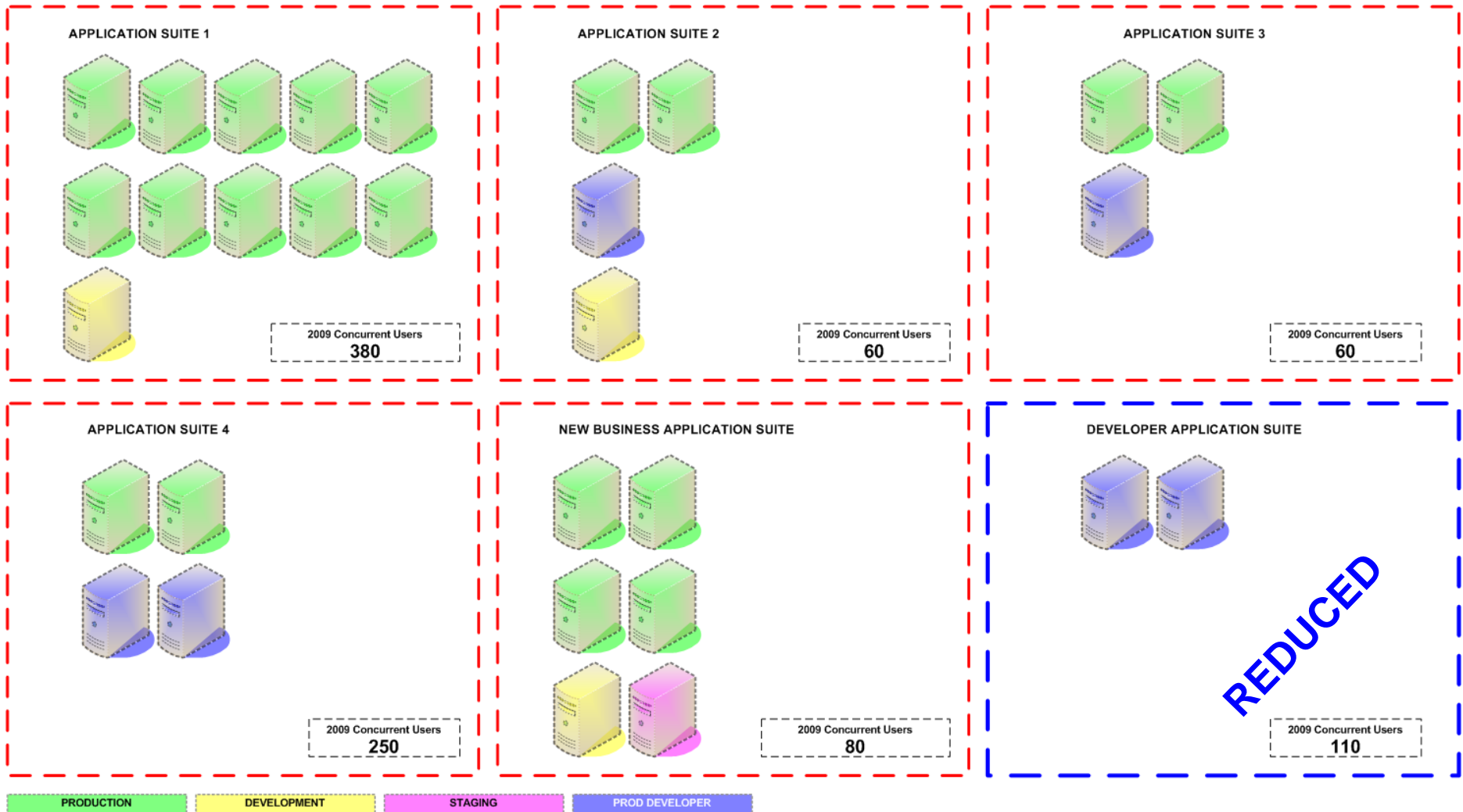
Project Approach



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Project Approach



Next Steps – Phase 2

- 3 Areas...
 - *Target Use Cases*
 - *Software & Tools*
 - *VDI Infrastructure*

Next Steps – Phase 2

- Target Use Cases
 - *Use case scenario appropriate for VDI – Phase 2*
 - Call centre users
 - Inforce, New Business
 - 3 master image builds

Next Steps – Phase 2

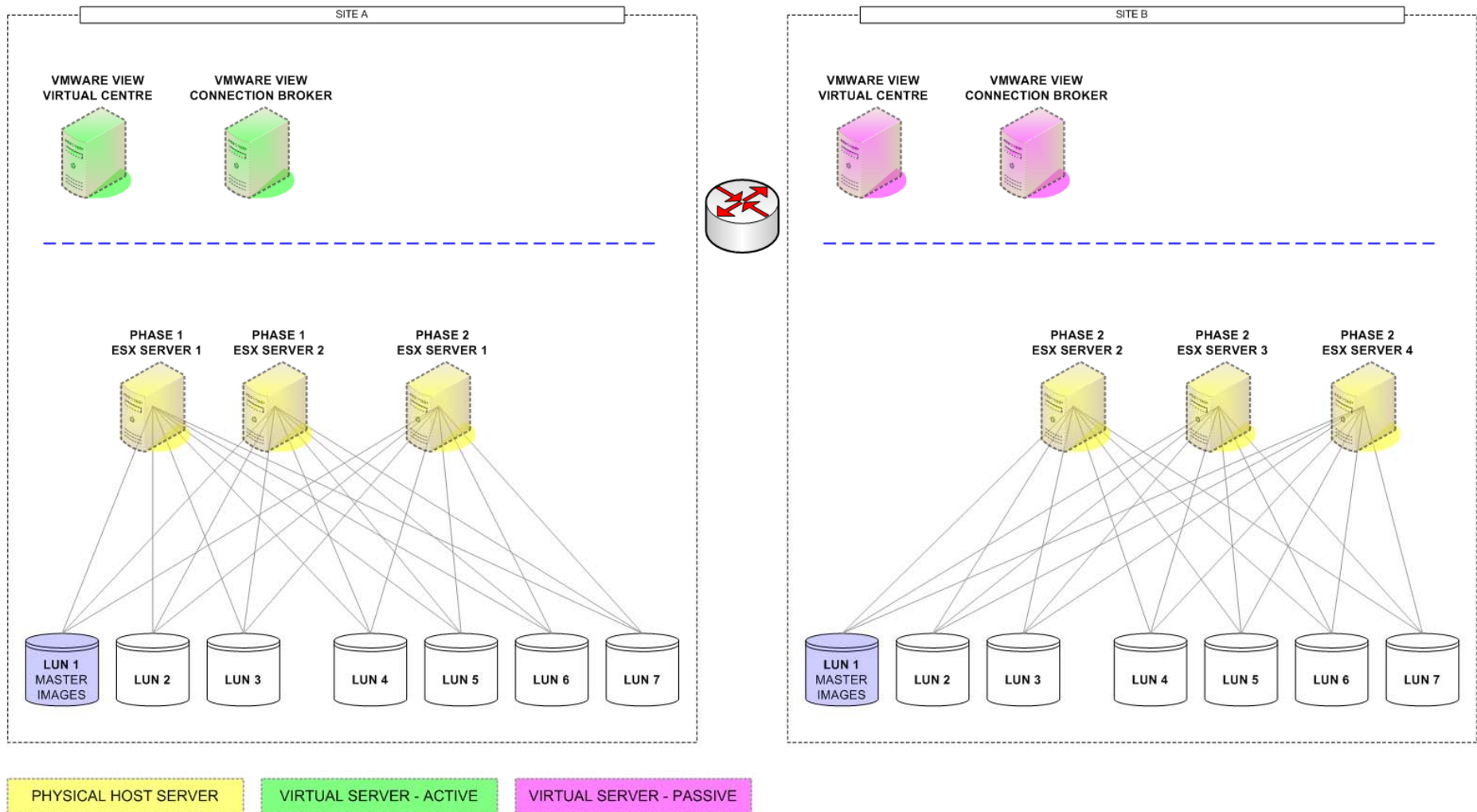
- Software Applications
 - *Office 2003, Adobe Reader*
 - *Attachmate, Rumba*
 - *Customer Service Work Bench, Vision 21*
 - *Siebel 8, File Net Client*
 - *xPression, T-Recs*

Next Steps – Phase 2

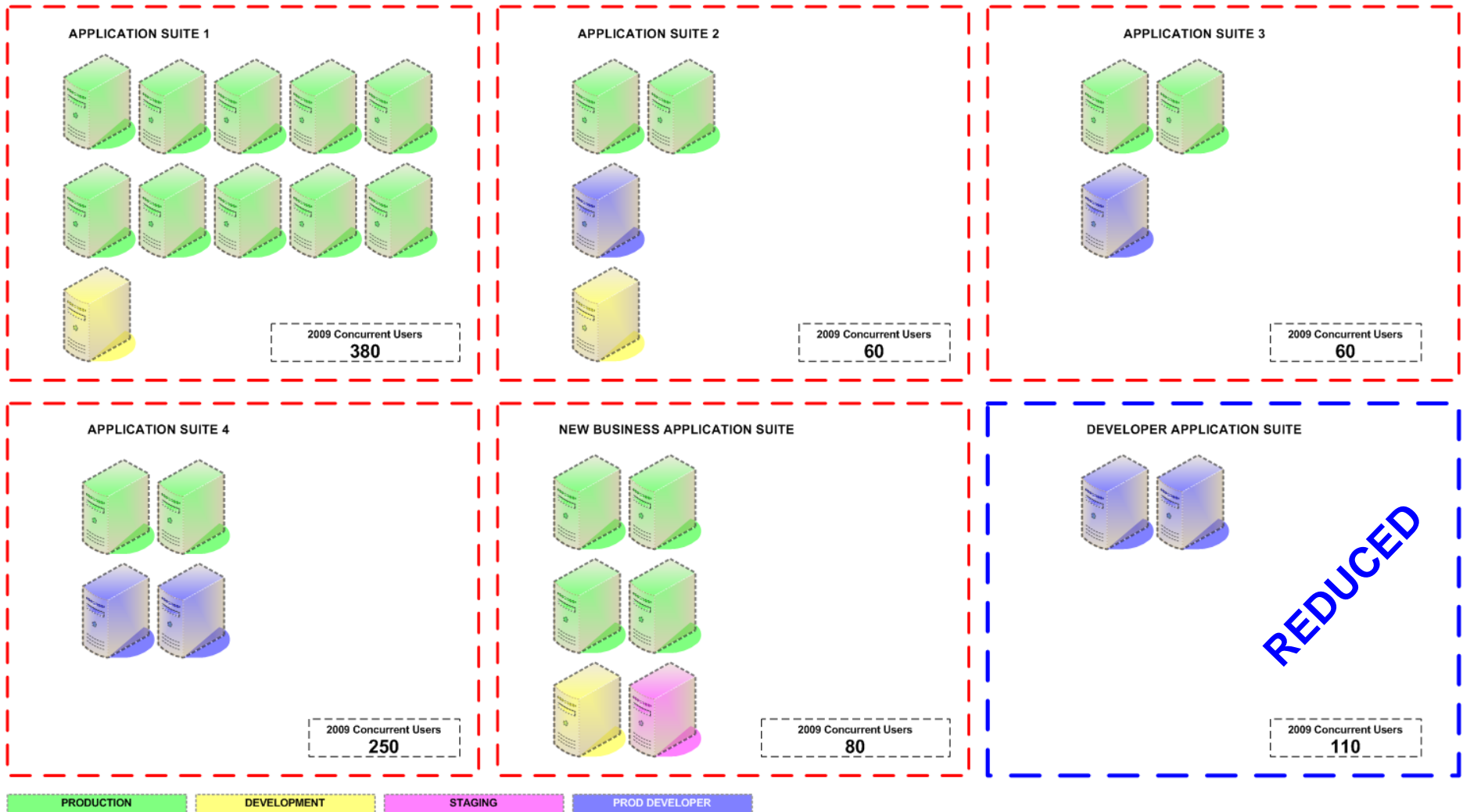
- VDI Infrastructure
 - *4 x IBM xSeries 3850 X5 (Target 128 VM's / Host)*
 - 256 gb ram, 4 x CPU 8 core (x7560) = 32 core
 - 5.6 TB of SAN space
 - (8 LUNS x 700 gb ea for clones, 64 VM's / LUN)
 - *VMWare ESX 4.0*
 - VMWare View 4.0, Composer, PCoIP Client

Next Steps – Phase 2

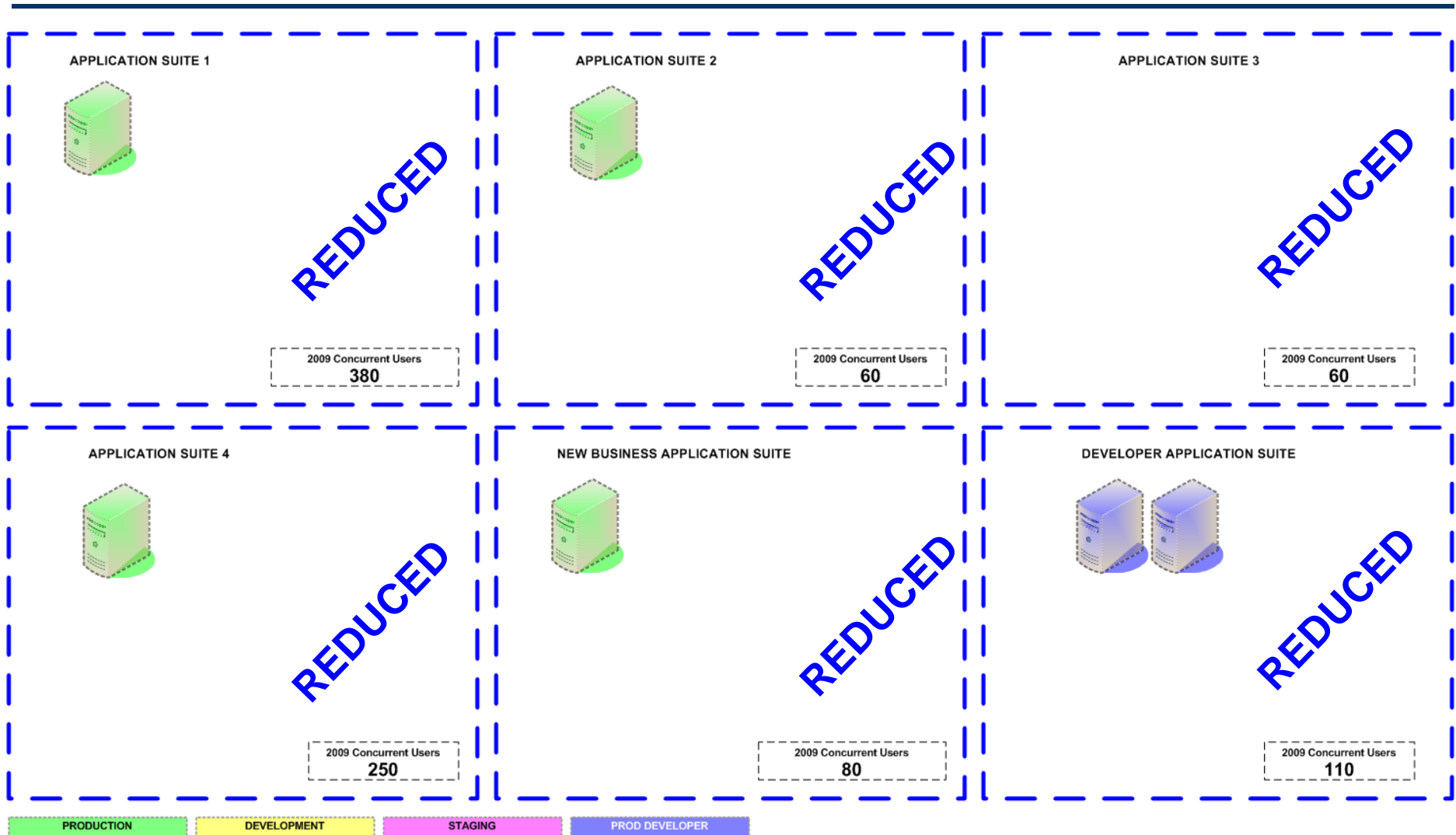
VDI PHASE 2 – DESIGN VIEW



Next Steps - Phase 2



Next Steps - Phase 2



Next Steps – The Future

- Other Possibilities
 - *Application Streaming to VDI*
 - *Target Standard Desktop Users*
 - *Remote Site Business Continuity*
 - *Thin Client Terminals*
 - *Etc...*

VDI Key Considerations

- **General**
 - *Carefully consider use cases, user acceptance key to adoption*
 - *Desktop virtualization technology and vendor landscape is still evolving*

VDI Key Considerations

- Licencing models
 - *OS licencing not well understood, varies depending on MS agreements, ThinClient usage, 3rd party vendors, etc...*
 - *Some application vendors changing to adapt to VDI software usage*

VDI Key Considerations

- Significant Infrastructure Investment
 - Servers
 - Proper sizing is key
 - 4-6 users per core estimate
 - need to understand your own desktop usage
 - Monitoring & baseline for growth

VDI Key Considerations

- Significant Infrastructure Investment
 - Storage
 - Can be largest cost of project
 - Can grow out of control if not carefully planned
 - Persistent images vs non-persistent
 - LUN size, max 64 clones per LUN
 - SAN for disk performance, NAS not suitable

VDI Key Considerations

- Significant Infrastructure Investment
 - Network
 - Desktops move into datacentre
 - User restrictions, ACL's
 - Sniffer traces, data captures, pattern analysis
 - Performance & scaling considerations

VDI Key Considerations

- **Security & Compliance**
 - Engage teams early
 - Full risk assessment
 - Desktop naming conventions for VDI
 - ACL's for grouping users to master images
 - Master image patch & security management program & process

Virtual Desktop Infrastructure

QUESTIONS...?