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A Wipro Company

Best Practices in Data Center Standardization

Interop Las Vegas 2008

Presenter: Dave Leonard

Designation: CTO - Infocrossing

Date: April 30, 2008

Company Information



- Founded in 1985
- Had been a publicly traded company (NASDAQ: IFOX)
- Purchased by Wipro in 2007
- Leading provider of selective IT outsourcing
- Approximately 850 employees
- 5 commercial data centers
- Diverse enterprise client base
- Infrastructure management
 - 40 mainframes (zSeries)
 - 100 AS/400s (iSeries)
 - 5,000 servers (Unix, Linux, Windows)
 - Data center LANs and customer WANs
- SaaS offerings
 - ISV
 - Owned software

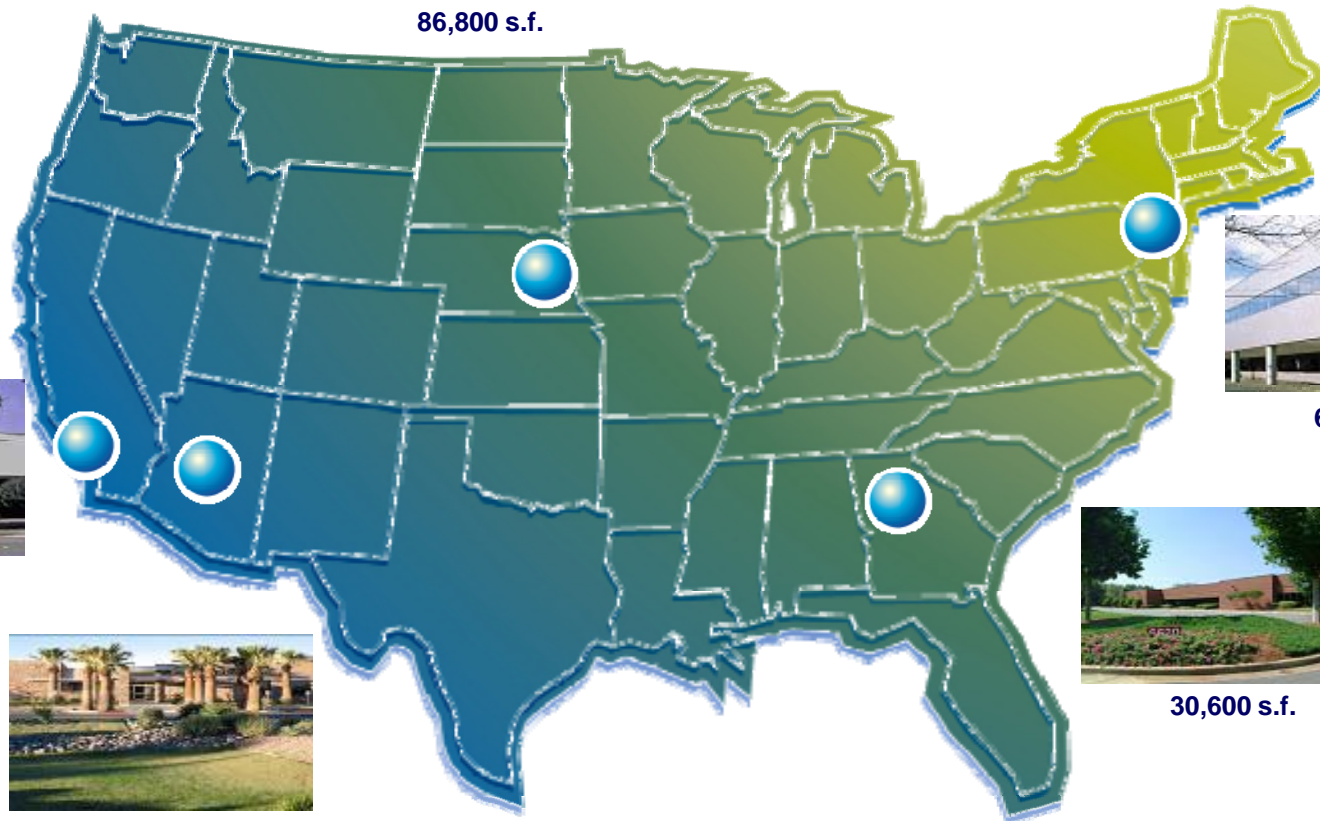
Data Center Locations



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86,800 s.f.



70,000 s.f.



60,000 s.f.



63,000 s.f.



30,600 s.f.

Data Center History



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- 1985 Infocrossing founded - Leonia, NJ
- 2002 Acquired Amquest - Norcross, GA
- 2002 Constructed new Norcross data center
- 2004 Acquired SMS – Brea, CA
- 2005 Acquired (i)Structure
 - Broomfield, CO
 - Omaha, NE
 - Tempe, AZ
- 2006 Closed old Norcross data center

Five Data Centers
Only Two from a Common Heritage

Tools, Processes and Teams of People Specific to Each Location



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Leonía, NJ

Tools
Processes
Teams



Brea, CA

Tools
Processes
Teams



Norcross, GA

Tools
Processes
Teams



Tempe, AZ

Tools
Processes
Teams



Omaha, NE



Break the Tie to Geography



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Leonía, NJ



Brea, CA



Norcross, GA



Common Tools
Common Processes
Geography-independent Teams

Tempe, AZ



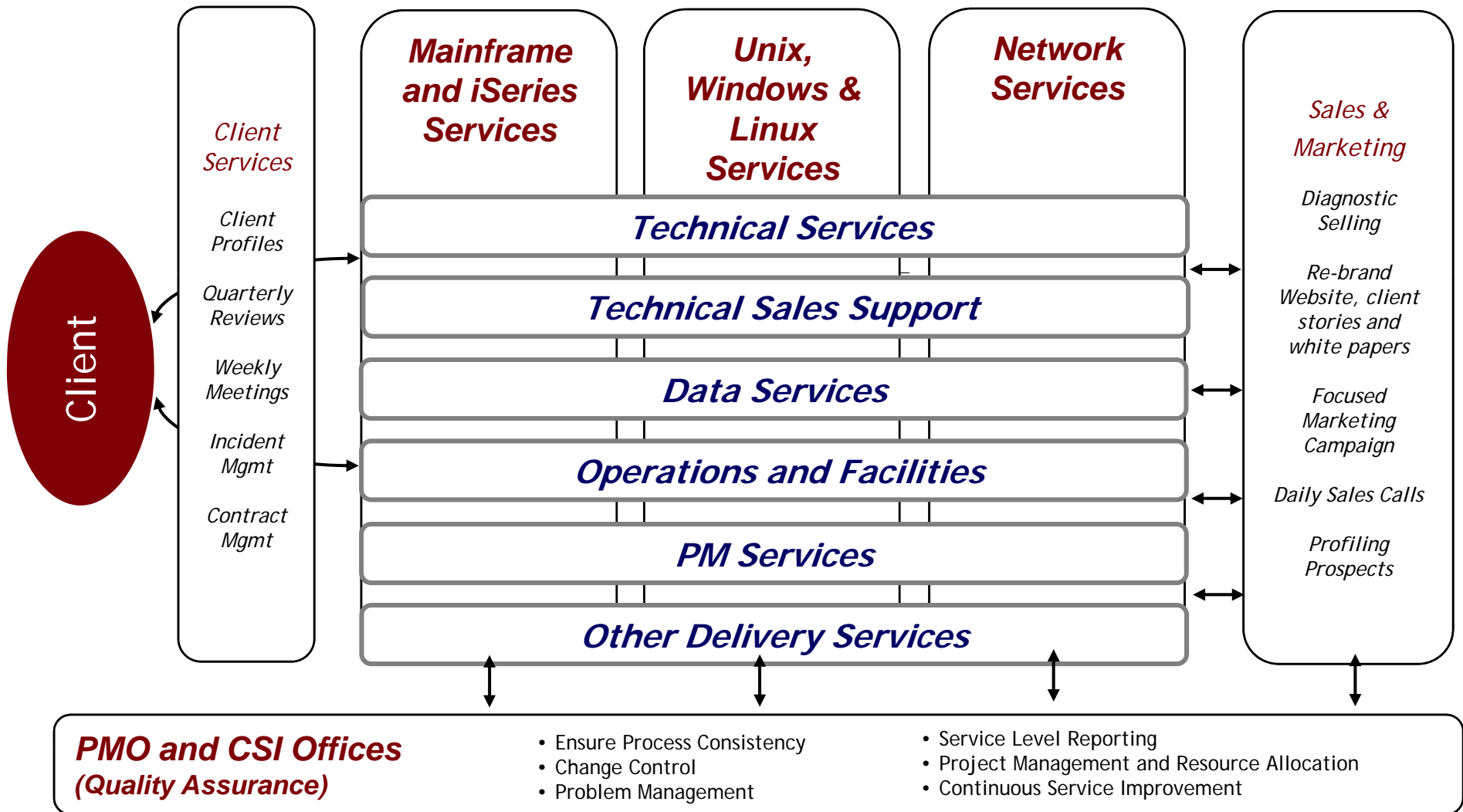
Omaha, NE



Break the Tie to Technology



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Starting Point



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- 73 major operations tools
- 169 implementations of those tools
 - Plus many customer-specific implementations
- Massive tool duplication / overlap
 - 14 separate systems monitoring tools
- Separate teams per location per technology
 - 11 separate storage management teams
- Varying degrees of automation
- Processes specific to location
- Inconsistent results

Vision without action is a Daydream
Action without vision is a Nightmare
Japanese proverb



Approach



- Identify desired benefits
- Architect future state
- Identify inhibitors/enablers
- Re-organize teams
- Select tools, processes
- Implement
- Measure result



Desired Benefits



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- Reduce cost
 - People, teams
 - Tools
 - Infrastructures
- Increase productivity
- Improve employee satisfaction
- Increase scalability
- Support remote and global operation
- Improve operations' customer service
- No disruption of customer operations

Future State Architecture



- Implement virtual teams
 - Any person can manage any device
 - Eliminate customer/site dedicated teams
 - Cross-technology teams where possible
- Consolidate tools/processes
 - One tool per function, two instances
 - One common set of processes
 - Leverage existing investment when possible
- Best of breed tool approach vs. a management suite
- All operations are remote operations
 - Common ops model regardless of location
 - Worldwide support
 - Data center-, colocation-, customer-located equipment
- Operations are multi-tenant (many customers sharing the same tools, processes, teams)

Inhibitors



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- Personnel
 - Re-organization (fiefdoms)
 - Control (not invented here)
 - Job security threat
- Access
 - Network/device access
 - Security
 - Rights management
- Process
 - Local, tribal knowledge
 - Knowledge sharing
 - Customer participation in the process (change)
- Existing infrastructure quality/location
 - Mainframe operations in too many locations
 - Different hardware infrastructure in different locations
 - e.g. SAN, Ethernet fabric, Backup, FICON vs. ESCON



Enablers



- Personnel
 - Participative design/buy-in to future organization
 - Elimination of location as a job threat
 - Empowerment (move routine jobs down)
- Access
 - Implement ubiquitous MPLS network
 - Implement security access/rights management system with 2-factor authentication
 - Improve KVM and other remote management technology
- Process
 - Implement knowledge management system
 - Define primary/secondary roles/responsibilities/capabilities
- Existing infrastructure quality/location
 - Consolidate mainframe operations into two locations
 - Migrate to “semi-standard” physical infrastructure
 - Provide future state physical design to guide investments
- Map “IT Transformation” to guide short-term implementations

Re-organize Teams

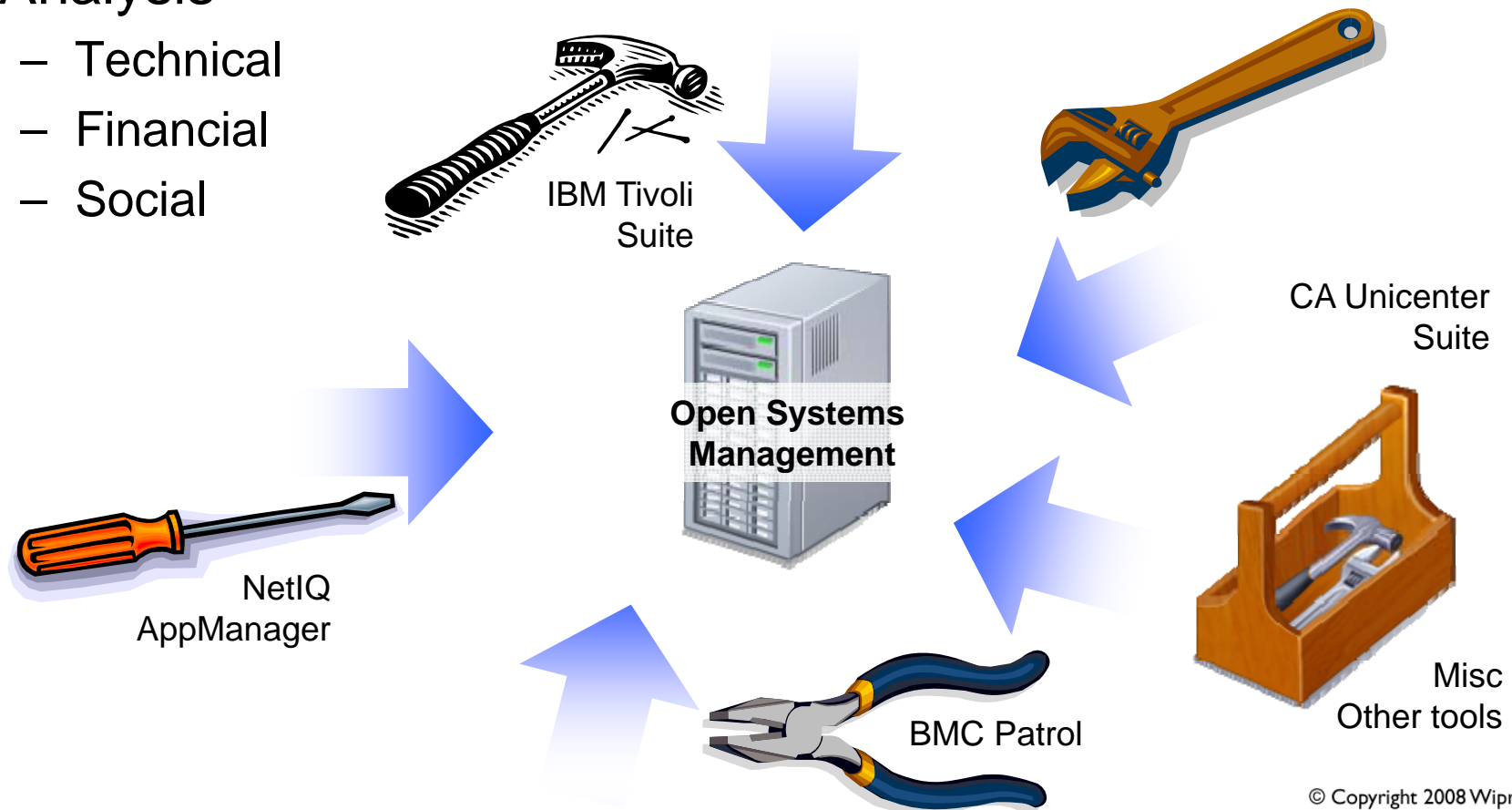


- Reduced number of separate technical teams by 55
 - Storage went from 11 teams to 1
- Implement primary/secondary responsibilities
 - By customer, by technology
 - Re-map job responsibilities to move routine functions down
- Spread management out across multiple locations
 - Supported by a lot of management travel at first
- Implement video conferencing in all locations
- Implement near-ubiquitous remote access (cell/EVDO based VPN)
- Implement consolidated customer contact
 - Help desk
 - Ticketing/request portals
 - Call-in numbers
- Confirm reorganization strategy and new processes with customers

Tool Selections



- Led by the re-organized ops team
- Assisted by Technical Architecture team
- Analysis
 - Technical
 - Financial
 - Social



Tool Selection Approach



- Considerations
 - Existing investment
 - License quantity
 - Ongoing cost
 - Personnel skill
 - Contract flexibility
 - Total cost over 4 years (acquisition, implementation, maintenance)
 - Existing licenses
 - Displacement/consolidation licenses
 - Future growth
 - Capability to support our vision
 - Technical capability
 - Licensing flexibility
- Vendor competitive bids
 - Use vendor programs (competitor displacement, etc.)
 - Leverage other vendor spend (esp. CA and IBM)
 - Create a “win” for the vendor
- Repeat for the other 12 major operational areas

Tool Selection Result



- In almost all areas, current costs went down and future costs went way down
 - Replacement tool cost very limited due to vendor displacement programs
 - Replacement labor subsidized by vendor
 - Significant decrease in maintenance costs
 - Significant decrease in future acquisition cost
 - Forgiveness/roll-in of current financial obligations
 - 4 year tool cost in Open Systems Management went down by 44%
- Increased flexibility
 - Use/reuse/repurposing of licenses
 - Special types of licenses (esp. low-function)
 - Future price protection

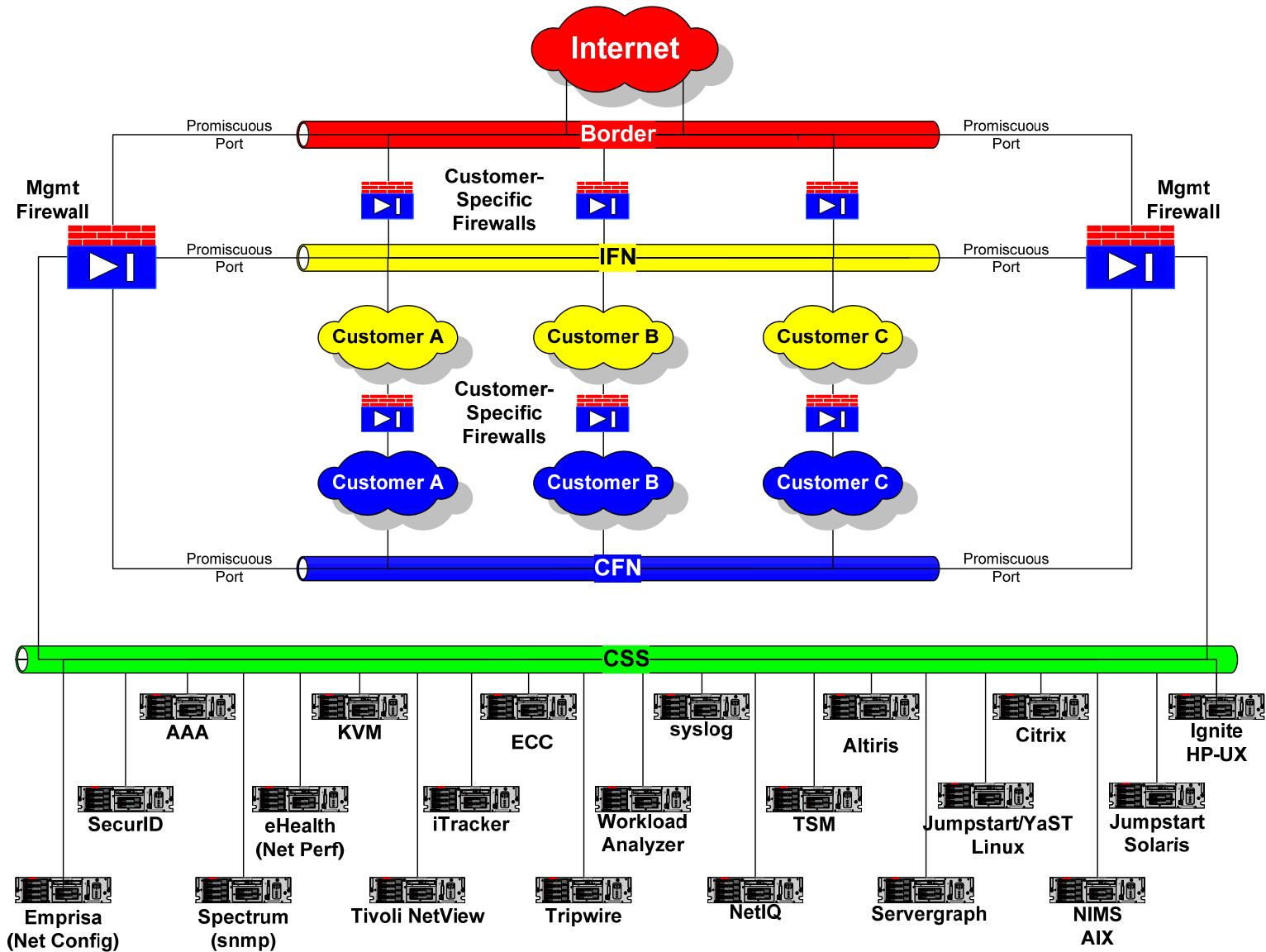
Tools – A Suite Solution or Best of Breed



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- Suite – commit to one integrated vendor solution where possible
- Best of Breed – select individual tools and integrate
- Considerations
 - End effect (# systems per SA, etc.)
 - Strong root cause analysis engine
 - Implementation/integration effort/speed
 - Flexibility
 - New services
 - Customer required/supplied tools
 - Future upgrades/displacements
 - Multi-tenancy
 - Service Provider model (multi-level delegated responsibility)
- Conclusion
 - Best of Breed approach better for Infocrossing
 - Integrate with “light management framework”

Tools – Best of Breed



Implementation



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- Implementation structure
 - By team
 - By technology
 - By tool
 - By location
 - By customer
- Timing
 - 8 month project
 - Mostly internal resources
 - Most of effort by Operations teams that have to live with the result
 - Guidance by Technical Architecture
 - Project Management support by PMO

Results



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- Lack of negative
 - No measurable customer disruption
 - Very little unplanned employee attrition
 - Few significant surprises along the path
- Positive
 - Job satisfaction up
 - Higher level employees
 - Less pager responsibility
 - Able to focus on engineering/value add
 - No on-call location restrictions
 - Lower level employees
 - Able to contribute on higher level tasks
 - Can see a clear progression path
 - Cost savings
 - Hard savings – \$200K → \$500K per month
 - Soft savings – All productivity ratios up significantly
 - Personnel reduced 20% (some outside of the 8 month project)
 - Devices managed increased by 100%
 - Robust remote management enabled (any device any location using same management model)
 - Customer service increased and made consistent

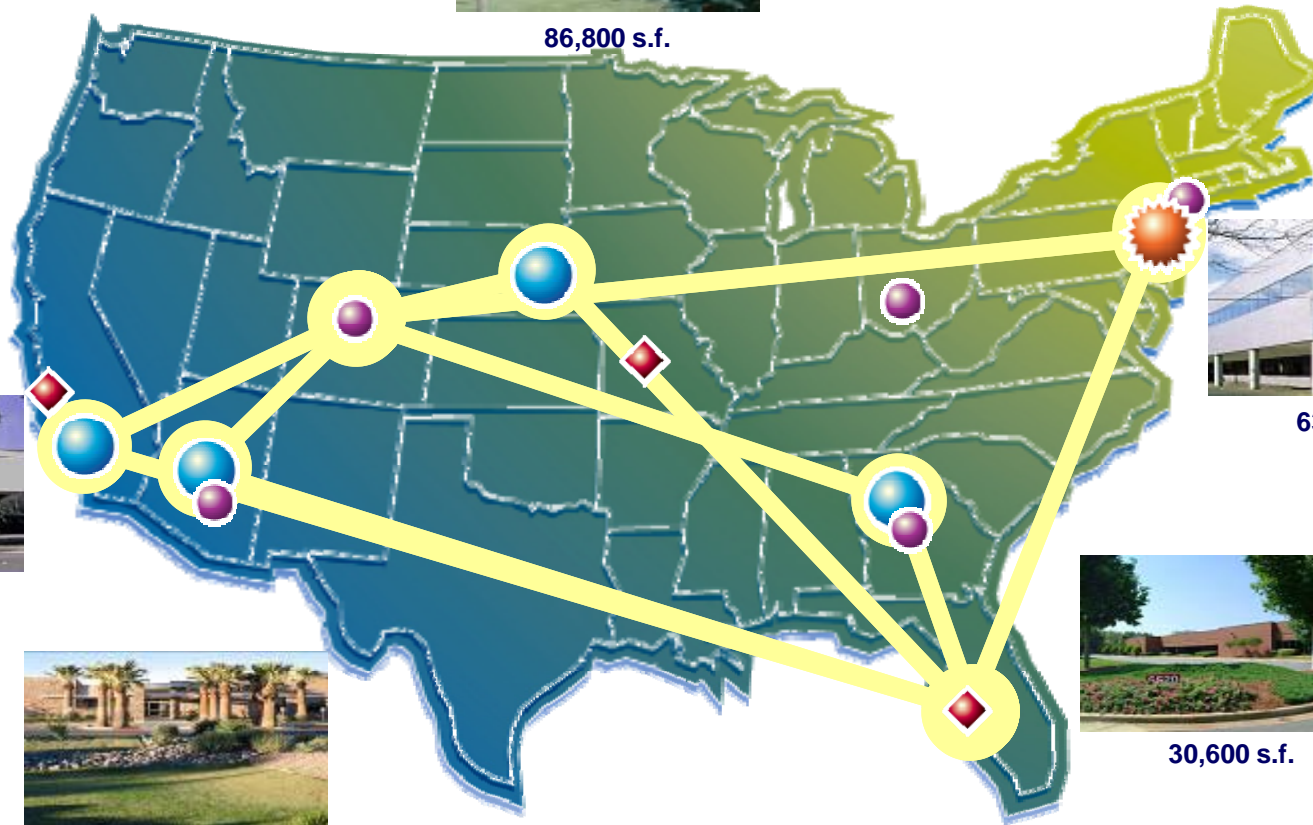
Virtualized Operations Model



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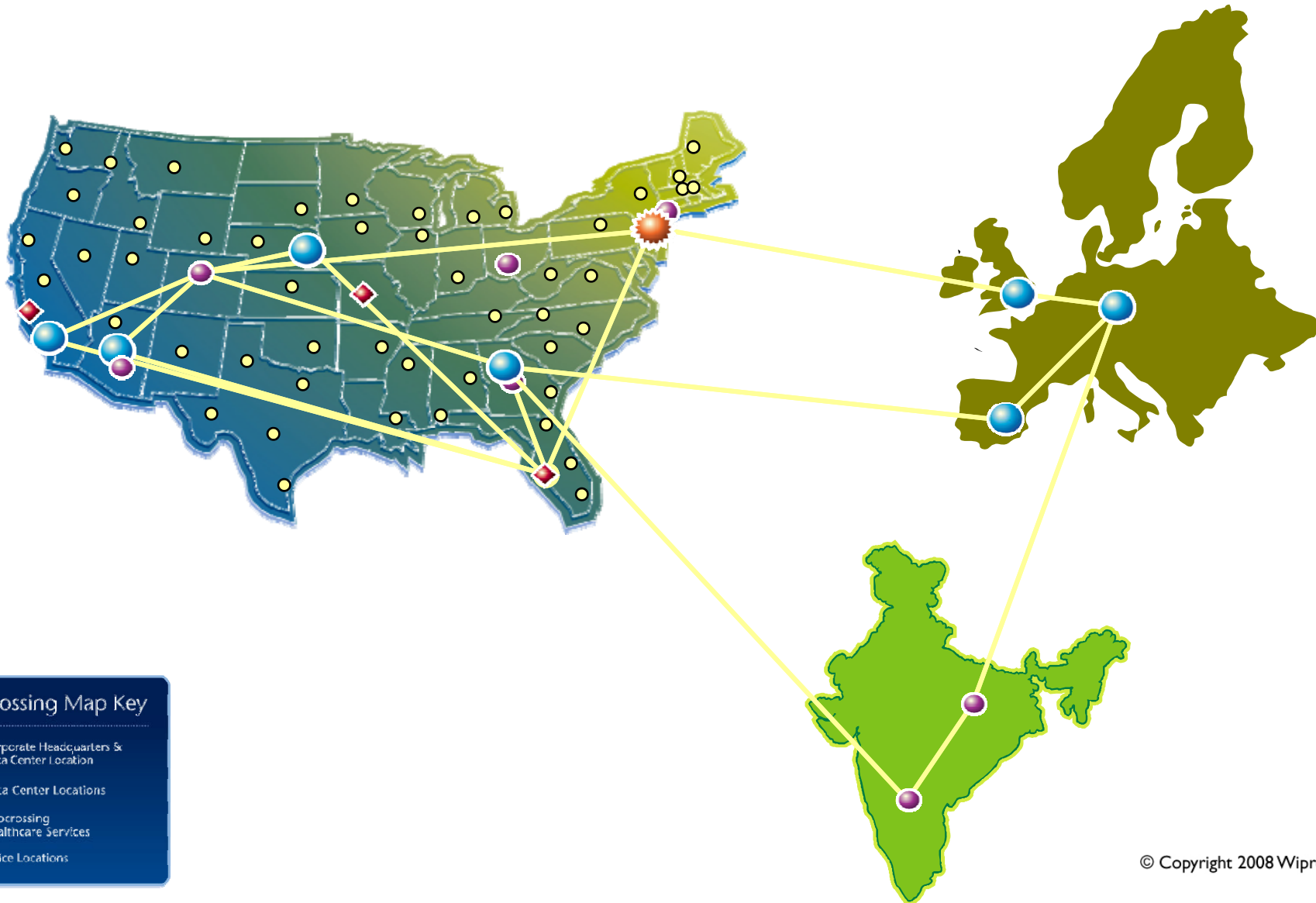
Infocrossing Map Key

- Corporate Headquarters & Data Center Location
- Data Center Locations
- Infocrossing Healthcare Services
- Office Locations

Virtualized Operations Model Extended



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Infocrossing Map Key

- Corporate Headquarters & Data Center Location
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Best Practices in Data Center Standardization



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Dave Leonard
Chief Technology Officer

Infocrossing, A Wipro Company
11800 Ridge Parkway, Suite 200
Broomfield, CO 80021
Tel : 720.566.1242
Fax : 720.566.1165
dave.leonard@infocrossing.com
www.infocrossing.com

Thank You