

IBM SmartCloud Desktop Infrastructure.... featuring

*IBM Virtual Desktop for Smart Business with VERDE
from Virtual Bridges*

Solution Overview

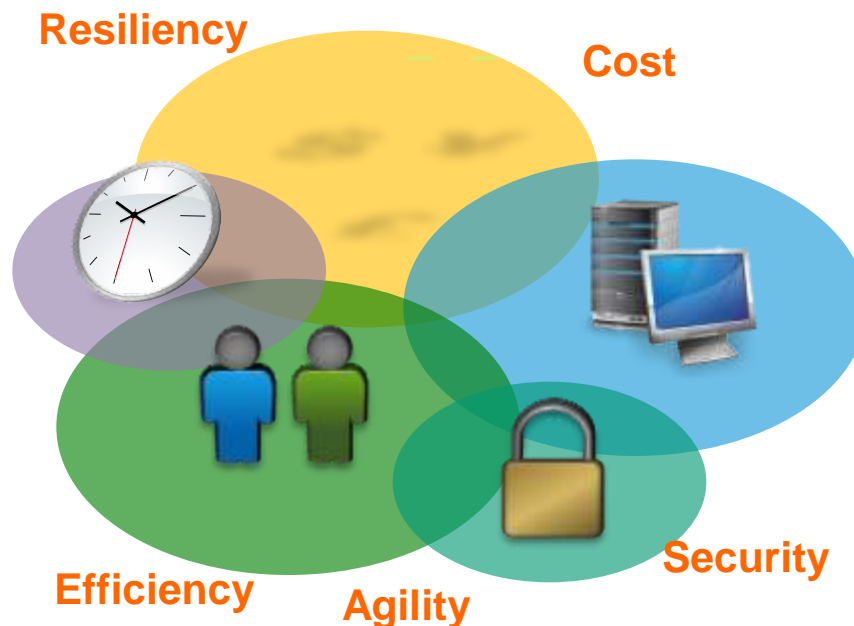


Growing Desktop Complexity

How can you balance divergent needs to improve outcomes?

IT challenges

- Control spiraling desktop TCO
- Protect data
- Recover from disasters
- Minimize security and compliance risks
- Manage Windows 7 and application upgrades
- Handle seasonal peaks



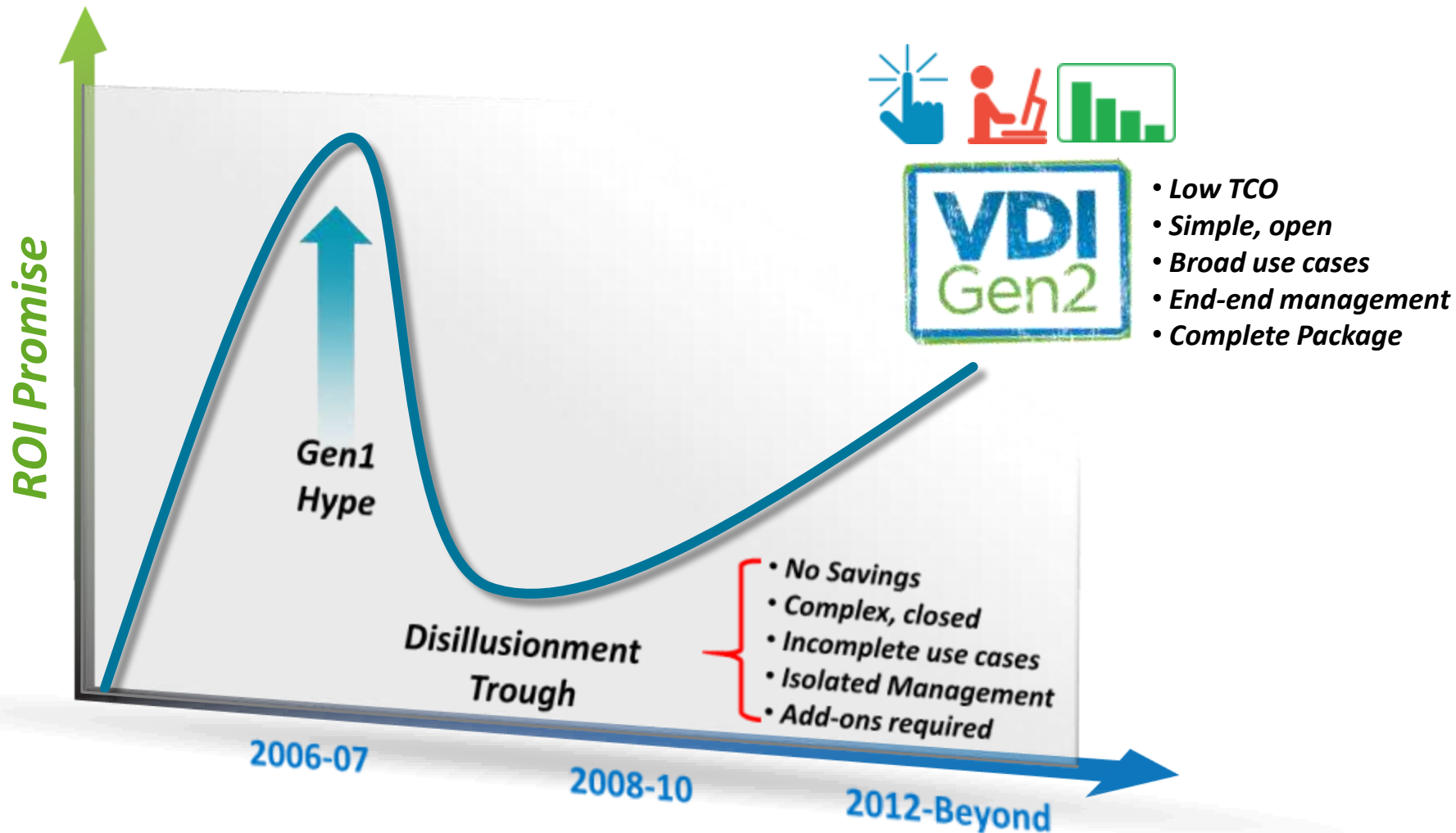
CEO, CFO priorities

- Reduce cost
- Lower business and IT risks
- Improve organizational agility

User demands

- Wide range of devices
- My own PC, iPad, etc.
- Mobility
- Backup
- Security

Gen 1 vs Gen 2 VDI... Gen 2 delivers on the promise



Gen 2 VDI Requirements

optimize cost, efficiency, agility, resiliency, and security



xx%



Lower TCO

- ROI positive Year 1
- Low CAPEX
 - Server
 - Storage
 - Network
 - Software
- Low OPEX



y hrs



Simple, open Architecture

- Single console
- Packaged, no add-ons, easy to install
 - Distributed Connection Broker
 - Minimize Server sprawl
 - Address External storage IOPS
 - Security inherent in architecture
- Leverage Open Source, Standards
 - Choice, Performance
- Interoperability with Microsoft



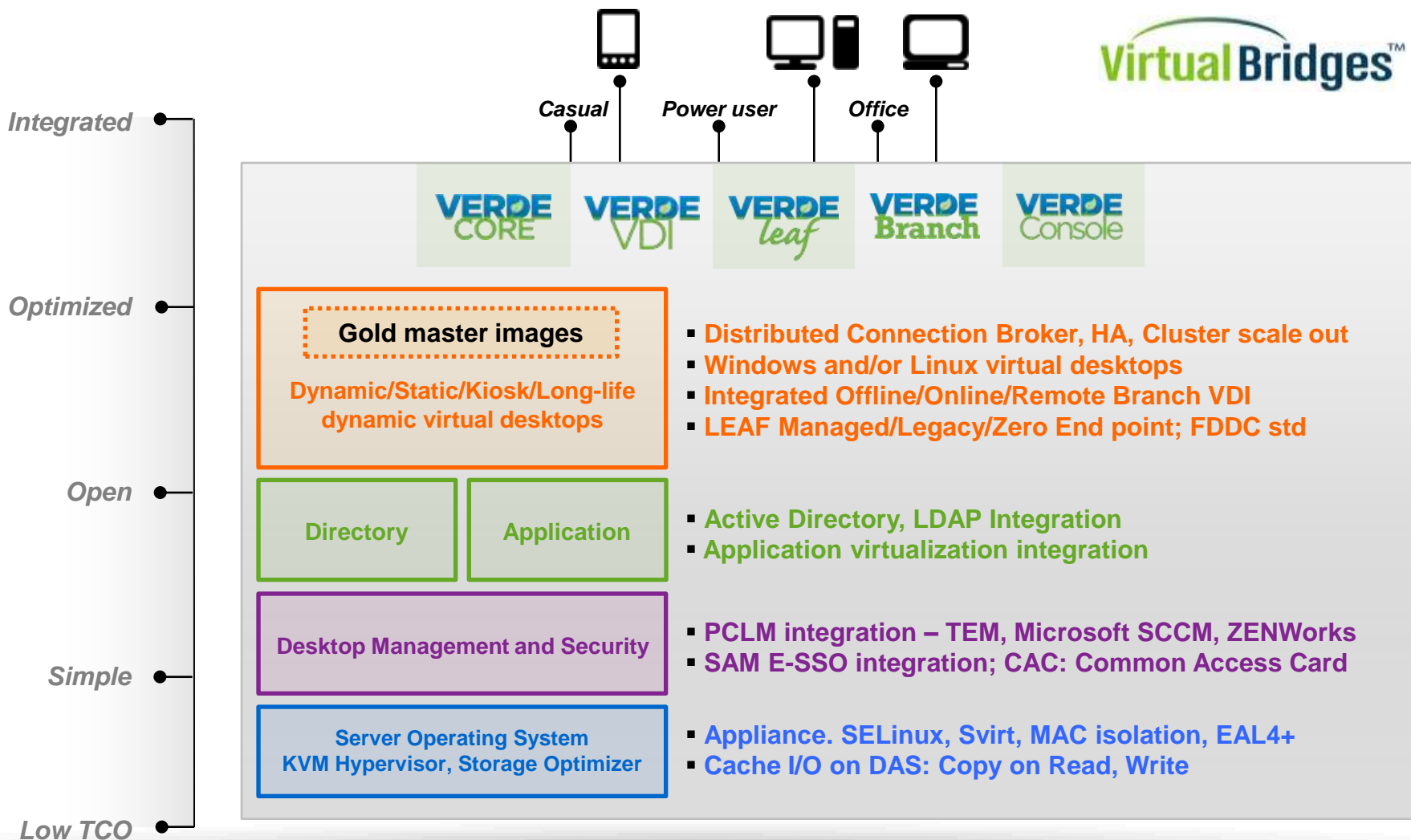
Productivity



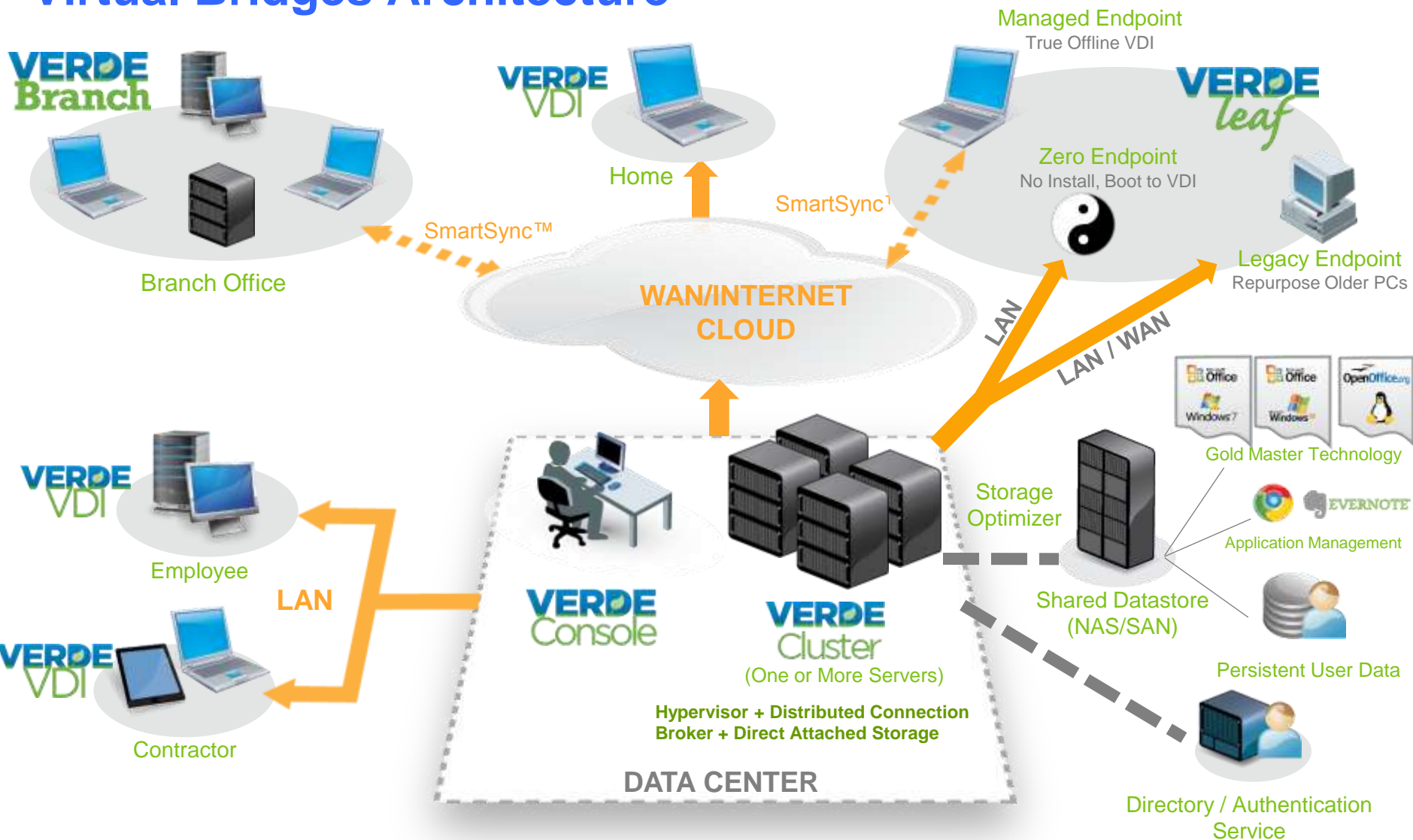
More Use cases

- Desktops, Laptops, MAC
 - BYoD, iPads, Tablets
- Smart Phones, Thin Clients
- Integrated Online, Offline, remote branch/locations

What is Virtual Desktop for Smart Business with VERDE?



Virtual Bridges Architecture

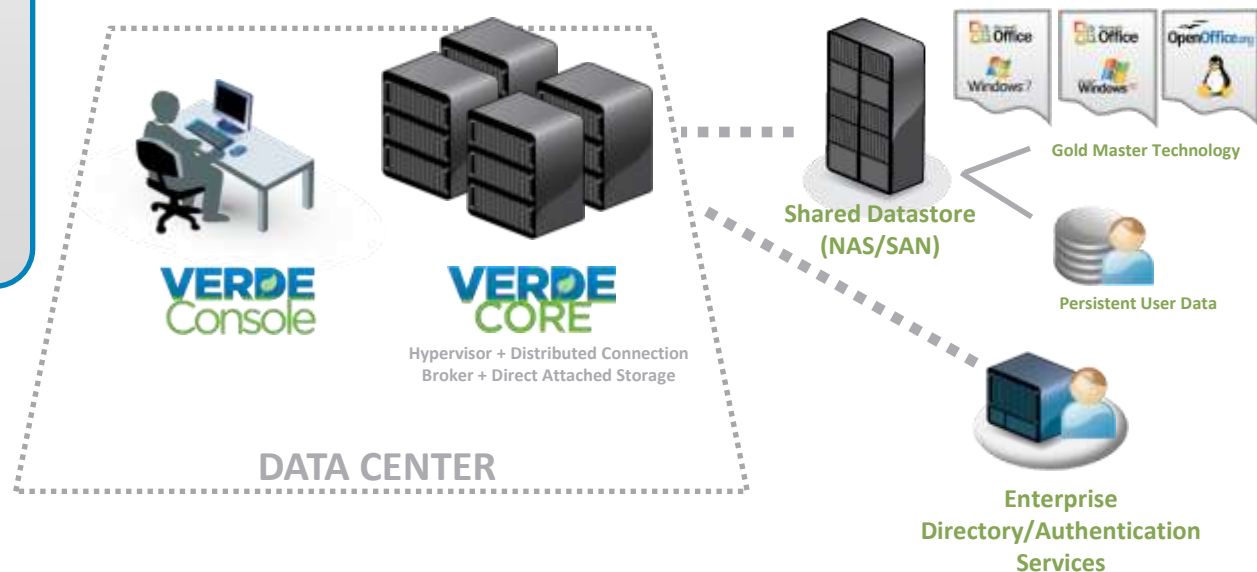


Data Center Architecture

- VERDE Core: All-in-One S/W Stack
- Automatic Cluster Master “election”
- AD/LDAP Integration
- Dynamic Provisioning
- Integrated Profile Management
- WinXP, Win7 (32-bit & 64-bit), Linux desktops
- Storage Optimizer™
- Integrated Management Console
- Web Services API
- Simple User Licensing

Business Impacts

- Lower S/W Licensing Costs
- Lower H/W Investment (10-15 users per Core, 5 IOPs per session)
- Management Simplicity – single pane
- Horizontally Scalable
- Fault Tolerance
- Ease of Integration with Existing Systems



Stateless, Personal, Dynamic Session = Gold Master Image copy (GM) + Persistent User Data (u) VS static statefull sessions

Persistent User Data

	User 1, 2, 3	User 5, 6	User 8, n
• Documents			
• Settings			
• Personalization			

	GMa	GMb	GMc
Applications		Microsoft Office Exchange ERP	 EMR
Guest Operating System			

Gold Master Images

- Gold Master
 - One master image
 - Same bits get provisioned to all users of that image
 - No "cloning" or "copying"
 - Advantages: storage size and storage performance, ease of image management
- User Profile
 - Dynamic "user-drive" paired with Gold Image
 - Each user has own user drive
 - Contains User's homedirectory
 - Windows profile (registry)
 - App data
- Documents Folder
 - Option to redirect to Verde-managed fileshare
 - Folder backed up to the DC once per day

Clustering, Scaling out

- Highly scalable clustering mechanism - 2-10k servers
- Components:
 - Cluster Master
 - VDI Servers
 - Shared Storage
- Cluster Master – real time session directory to entire cluster, maintains:
 - List of VDI Servers
 - List of Logged in Users
 - Hosts VERDE Console
- VDI Servers – Serve Virtual Desktops to Users
- If Cluster Master fails, existing user connections continue operating
- Native Cluster Master fail-over
 - One of the CM candidates will automatically take over the CM role
- Cluster-Wide licensing
- Unattended Cluster-Wide install/upgrade

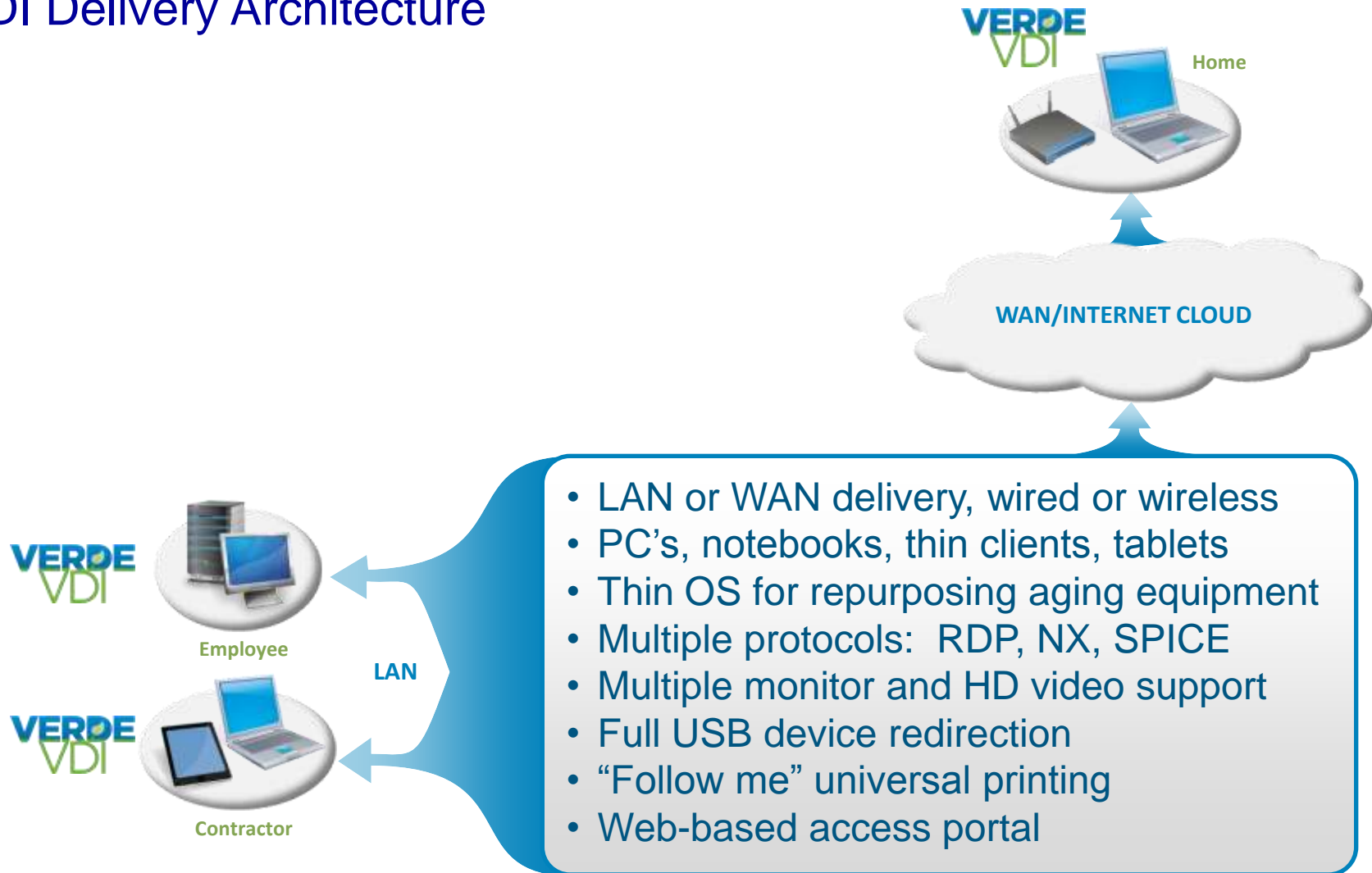
Storage

- Shared (external) Storage
 - Gold Image(s)
 - User Data – shared storage
 - User files virtual disk size (“D:” or “/home”)
 - User Documents
- Local (transient) Storage (Storage OptimizerTM)
 - Copy on Read
 - Gold Image size* number of Gold Images
 - Copy on Write
 - Approx. 20% of Gold Image size per User to maintain dynamic session in Gold Master model

IBM Virtual Desktop User Access

- VERDE Client
 - Lightweight, can run almost anywhere
- VERDE Cloud Branch
 - Branch Office based Server
 - WAN connectivity to central IBM Virtual Desktop Server and Gold Image repository
 - Local virtual desktop sessions see LAN-like experience
- VERDE LEAF
 - Live Environment Access Format
 - Connected and disconnected use
 - “Desktop on a Stick” Self-Contained VERDE Environment

VDI Delivery Architecture



Remote Display Protocols

- Protocols
 - RDP for Windows virtual desktops
 - Nx – No Machines for Linux virtual desktops
 - SPICE – high-def protocol
 - Supports Windows and Linux virtual desktops
 - VoIP – Lip sync technology
 - Latency friendly (upto 200MS)
 - Multi media applications
- Bandwidth: 56Kbps/sec/user - 128Kbps/sec/user
- Latency: traditional: up to 80ms. SPICE: up to 200ms
- Access: Web Browser (RDP, Nx, SPICE) or rich client (SPICE)

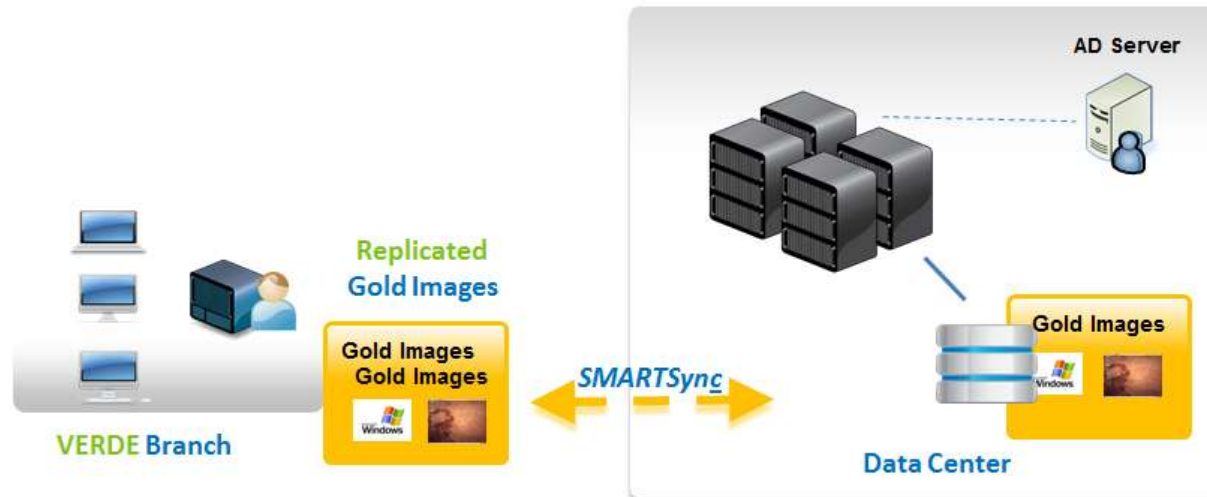
Branch Office Architecture



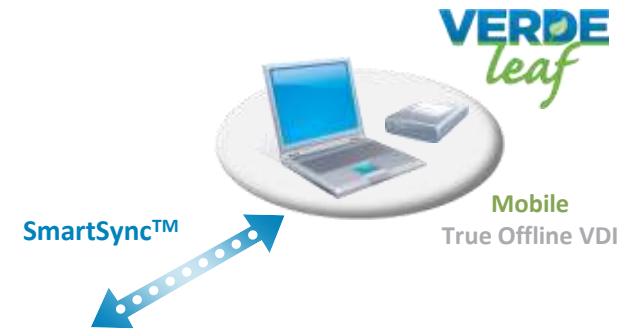
- Full-function VERDE environment that represents a cache of the Data Center - VMs run locally
- Centrally administered via Verde Management Console
- Branch can run between 1 and 10,000, scaling horizontally
- Multi-user version of SmartSync
- Can serve its own online and offline clients
- App delivery to branch for virtualized applications (following data center policies)

Key Differentiator: Cloud Branch

- Serve Branches without concern for VDI WAN scaling or Data Center failure
- No need for constant connectivity with Data Center
- Users maintained centrally (AD, LDAP)
- Central management to remote facilities / branches, regional data centers
- User's benefit from LAN connections
- Automatic updates



LEAF - Managed End-Point, Disconnected Use Architecture



- Type 1 Client-side Hypervisor
- Boot from either internal HD or portable drive
- Supports USB devices
- Fully encrypted at the block level
- Configurable security policies for disconnected operation
- Centrally managed from same VERDE infrastructure
- Portable hypervisor presents exact same virtual desktop
- Bi-directional SmartSync protocol – LEAF deltas only
- Offline app delivery for virtualized applications
- Automatic file syncing for User data

Integrated Offline VDI in Gen 2 overcomes barriers

- Neither VDI nor ‘pure’ offline VDI provide the complete flexibility for users and IT – need for “Integrated Offline VDI”
 - Users:
 - Works across PCs, Thin Clients, PDAs etc
 - Works in both online/offline mode
 - IT:
 - Security, Cost and Manageability optimized for all use cases
- Users need seamless movement between online & Offline VDI sessions
 - Need for **a portable hypervisor** between Server (VDI) & Clients
 - allows the portability of virtual desktops between client PCs and VDI servers
 - Need for seamless User Data Sync between VDI & Offline VDI
 - allows for a consistent desktop experience between VDI and offline VDI sessions – ubiquitous desktop experience across all the user devices

Glossary

Key elements of the VERDE environment



VERDE = Virtual Enterprise Remote Desktop Environment:
the suite of virtual desktop/management software from Virtual Bridges

- **Gold Image** – A master or —template virtual machine installation that can then be deployed to multiple users for dynamic instantiation. A Gold Image combines a guest operating system, applications, system-wide desktop configuration, and policies—to later be layered with individual user data when deployed.
- **Server** – The computer hosting virtual desktop sessions to remote users or the computer used to administer virtual desktops in a single-node environment. Each server is responsible for authenticating and authorizing users to Gold Images and then running the selected virtual desktop sessions.
- **VDI (Virtual Desktop Infrastructure)** —the mechanism of serving desktop sessions to remote users from servers as discrete environments.

Key elements of the VERDE environment (cont.)



- **Dynamic virtual desktop** - One instance of a Gold Image virtual machine when started by a user. The guest operating system, application, system-wide desktop configuration, and policies may not be changed by the dynamic user. However, the dynamic user may apply personal settings and documents to the virtual desktop instance to form a full-featured, personalized session.
- **Client** - Remote access point that connects to a guest on the host; typically this is either an ordinary desktop PC/laptop, or a thin client device running Virtual Bridges access software to display and access a server-hosted virtual desktop.
- **Virtual Machine** – The container technology that runs desktop environments for remote users. A VERDE server will host many virtual machines, each containing a user desktop session and providing a common set of emulated hardware to the operating system and applications running inside.

Key elements of the VERDE environment (cont.)



- **Host** - The server hardware and operating system which provide an environment to consolidate virtual desktops.
- **Guest** - The virtual desktop itself (as a guest of the host). One host may serve many guest virtual desktops.
- **Management Console** - Web-based graphical interface used to create and manage Gold Images. Administrators can view virtual desktop sessions grouped by user or server or based on type of Gold Image. In addition, the console provides real-time server utilization metrics
- **Cluster** – A group of servers acting as a single group that serves large numbers of virtual desktop environments to remote users.

SPICE Client

- The IBM Virtual Desktop (SPICE) client is a light-weight application that authenticates users and provides access to user desktop sessions running on the IBM Smart Desktop servers.
- The SPICE client protocol is optimized to provide the best user experience based on the end user location (LAN, WAN or at a branch location), particularly for high-res multi media.
- The SPICE client can run on Windows, Linux, MAC workstations, Netbooks and PDAs.
- A user can launch more than one virtual desktop session simultaneously by running multiple client sessions

End of Presentation